Authorization for Credit Card Transactions

Department of Homeland Security

Form G-1450

How To Fill Out Form G-1450

1. Type or print legibly in black ink.
2. Complete the "**Applicant's/Petitioner's/Requester's Information**," "**Credit Card Billing Information**," and "**Credit Card Information**" sections and sign the authorization. **NOTE:** The credit card must be issued by a U.S. bank.
3. Place your Form G-1450 ON TOP of your application, petition, or request package.

NOTE: Failure to provide the requested information may result in DHS and your financial institution not accepting the payment. DHS cannot process credit card payments without an authorized signature.

NOTE: Please see the USCIS Form G-1450 website for additional information.

We recommend that you print or save a copy of your completed Form G-1450 to review in the future and for your records.

By completing this transaction, you agree that you have paid for a government service and that the filing fee, biometric services fee and all related financial transactions are final and not refundable, regardless of any action DHS takes on an application, petition, or request. You must submit all fees in the exact amounts. DHS will charge your credit card up to the amount you authorize below.

Please refer to the form(s) you are filing for additional information, or you may call the USCIS Customer Contact number at **1-800-375-5283**. For TTY (deaf or hard of hearing) call: **1-800-767-1833**.

Applicant's/Petitioner's/Requester's Information (Full Legal Name)		
Given Name (First Name) Luciano Aparecido	Middle Name (if any)	Family Name (Last Name) DE SOUZA
Credit Card Billing Information (Credit Card Holder's Name as it Appears on the Card)		
Given Name (First Name) Otavio	Middle Name (if any) H	Family Name (Last Name) SILVA
Credit Card Holder's Billing Address:		
Street Number and Name 5051 La Jolla Blvd	Apt. Ste. Flr. ☒ ☐ ☐	Number 202
City or Town San Diego	State CA	ZIP Code 92109
Credit Card Holder's Signature and Contact Information:		
Credit Card Holder's Signature		
Credit Card Holder's Daytime Telephone Number 5102419336	Credit Card Holder's Email Address otavio@yousalaw.com	
Credit Card Information		
Credit Card Number	**Credit Card Type:** ☐ Visa ☐ MasterCard ☐ American Express ☐ Discover	Authorized Payment Amount $ 715.00
Credit Card Expiration Date (mm/yyyy) CVV Code		

Authorization for Credit Card Transactions

Department of Homeland Security

Form G-1450

How To Fill Out Form G-1450

1. Type or print legibly in black ink.
2. Complete the "**Applicant's/Petitioner's/Requester's Information**," "**Credit Card Billing Information**," and "**Credit Card Information**" sections and sign the authorization. **NOTE:** The credit card must be issued by a U.S. bank.
3. Place your Form G-1450 ON TOP of your application, petition, or request package.

NOTE: Failure to provide the requested information may result in DHS and your financial institution not accepting the payment. DHS cannot process credit card payments without an authorized signature.

NOTE: Please see the USCIS Form G-1450 website for additional information.

We recommend that you print or save a copy of your completed Form G-1450 to review in the future and for your records.

By completing this transaction, you agree that you have paid for a government service and that the filing fee, biometric services fee and all related financial transactions are final and not refundable, regardless of any action DHS takes on an application, petition, or request. You must submit all fees in the exact amounts. DHS will charge your credit card up to the amount you authorize below.

Please refer to the form(s) you are filing for additional information, or you may call the USCIS Customer Contact number at **1-800-375-5283**. For TTY (deaf or hard of hearing) call: **1-800-767-1833**.

Applicant's/Petitioner's/Requester's Information (Full Legal Name)		
Given Name (First Name) Luciano Aparecido	Middle Name (if any)	Family Name (Last Name) DE SOUZA
Credit Card Billing Information (Credit Card Holder's Name as it Appears on the Card)		
Given Name (First Name) Otavio	Middle Name (if any) H	Family Name (Last Name) SILVA
Credit Card Holder's Billing Address:		
Street Number and Name 5051 La Jolla Blvd	Apt. Ste. Flr. ☒ ☐ ☐	Number 202
City or Town San Diego	State CA	ZIP Code 92109
Credit Card Holder's Signature and Contact Information:		
Credit Card Holder's Signature		
Credit Card Holder's Daytime Telephone Number 5102419336	Credit Card Holder's Email Address otavio@yousalaw.com	
Credit Card Information		
Credit Card Number	**Credit Card Type:** ☐ Visa ☐ MasterCard ☐ American Express ☐ Discover	Authorized Payment Amount $ 300.00
Credit Card Expiration Date (mm/yyyy) CVV Code		

EMPLOYMENT-BASED SECOND PREFERENCE (EB-2) IMMIGRANT PETITION WITH REQUEST FOR A NATIONAL INTEREST WAIVER

Petitioner: DE SOUZA, Luciano Aparecido

HS Law Corp
P.O Box 90487
San Diego - CA - United States

TABLE OF CONTENTS

Petitioner: Luciano Aparecido de Souza
Type of Petition: I-140, EB-2 National Interest Waiver
Classification Sought: Immigration and Nationality Act § 203(b)(2)(B)(i)
Proposed Occupation: General and Operations Manager (SOC 11-1021.00)

Forms	● Form G-1450 in the amount of $715 toward the Form I-140 filing fee ● Form G-1450 in the amount of $300 toward the Asylum Program Fee ● Form G-1145, E-Notification of Application/Petition Acceptance ● Form G-28, Notice of Entry of Appearance as Attorney or Accredited Representative ● Form I-140, Immigrant Petition for Alien Workers ● Form ETA-9089, Application for Permanent Employment Certification
Petition Cover Letter	● Summary of Cover Letter ● Petition Cover Letter ● Exhibit List
Exhibit A	Curriculum Vitae of Luciano Aparecido de Souza
Exhibit B **ELIGIBILITY CRITERIA**	**Advanced Degree Eligibility:** 1. Bachelor of Business Administration, with a Concentration in Foreign Trade – Diploma, Certificate, and Academic Transcripts – Methodist University of São Paulo (UMESP) 2. Graduate Study in Logistics – MBA Diploma, Certificate, and Supporting Academic Records – Fundação Getulio Vargas (FGV) 3. Academic Credential Evaluation – Carnegie Evaluations LLC, including the evaluator's curriculum vitae and supporting academic references **Professional Experience and Business Activity:** 1. Accountant-Certified Revenue Schedule – E-IT Services Consultoria de Informática Ltda. 2. Accountant-Certified Revenue Schedule – E-IT Technologies Consultoria de Informática Ltda. 3. Corporate Records, Amendments, and Contracts – E-IT Technologies Consultoria de Informática Ltda. 4. Corporate Records, Amendments, and Contracts – E-IT Services Consultoria de Informática Ltda.
Exhibit C **NATIONAL INTEREST WAIVER**	**C.I – First Prong – Substantial Merit and National Importance:** ● Business Plan for E-IT Technologies – Austin, Texas ● Government and Policy Materials Supporting Advanced Manufacturing, Enterprise-System Interoperability, Supply-Chain Visibility, Electronic Invoicing, Trade Modernization, and Related Professional Demand: **C.II – Second Prong – Well Positioned to Advance the Proposed Endeavor:** ● All documents contained in Exhibit B ● **Professional Licenses and Certifications:**

	1. Professional Registration as an Administrator – Regional Council of Administration of São Paulo (CRA-SP) 2. SAP Solution Consultant Certification – SCM–Procurement with my SAP ERP 2005 ● **Courses and Additional Professional Qualifications:** 1. SAP Courses and Certificates 2. Other Professional Courses and Certificates ● **Evidence of Professional Recognition:** 1. ASUG Brasil Impact Awards (2015) – Second-Place Recognition for the Beauty'in SAP Enterprise-Recovery Project and Supporting Publication ● **Evidence of Compensation and Professional Standing:** 1. Brazilian Individual Income Tax Returns – Tax Years 2022 through 2025 2. Glassdoor Salary Benchmark Evidence – Chief Technology Officer / Technology Director in Brazil ● **Evidence of Financial Viability and Company Assets:** 1. Accountant's Letter concerning E-IT Technologies' financial availability and Mr. de Souza's ownership, management authority, and capacity to allocate company resources 2. Itaú Consolidated Investment Position – E-IT Technologies Consultoria de Informática Ltda. ● **Letters of Support:** 1. Mr. Glenn Gunter – Senior Director, Application Services, Apex Tool Group, LLC 2. Mr. Leo Anderson – Contractor Governance SAP Technical Lead Architect, Eastman Chemical Company 3. Mr. Michael Powell – Director, IT Product Management – Manufacturing Operations & Supply Chain 4. Mr. Alvaro Piero Marzullo – Vice President, Latin America & Caribbean, CAMIN Cargo Control, with supporting curriculum vitae
<u>Exhibit D</u> **PERSONAL DOCUMENTS**	● Birth Certificate and Corresponding Certified English Translation ● Passport Biographical Page ● United States Visa ● Marriage Certificate and Corresponding Certified English Translation ● Derivative Beneficiaries' Birth Certificates and Corresponding Certified English Translations ● Derivative Beneficiaries' Passport Biographical Pages ● Derivative Beneficiaries' United States Visas

e-Notification of Application/Petition Acceptance

Department of Homeland Security
U.S. Citizenship and Immigration Services

USCIS
Form G-1145

What Is the Purpose of This Form?

Use this form to request an electronic notification (e-Notification) when U.S. Citizenship and Immigration Services accepts your immigration application. This service is available for applications filed at a USCIS Lockbox facility.

General Information

Complete the information below and clip this form to the first page of your application package. You will receive one e-mail and/or text message for each form you are filing.

We will send the e-Notification within 24 hours after we accept your application. Domestic customers will receive an e-mail and/or text message; overseas customers will only receive an e-mail. Undeliverable e-Notifications cannot be resent.

The e-mail or text message will display your receipt number and tell you how to get updated case status information. It will not include any personal information. The e-Notification does not grant any type of status or benefit; rather it is provided as a convenience to customers.

USCIS will also mail you a receipt notice (I-797C), which you will receive within 10 days after your application has been accepted; use this notice as proof of your pending application or petition.

USCIS Privacy Act Statement

AUTHORITIES: The information requested on this form is collected pursuant to section 103(a) of the Immigration and Nationality Act, as amended INA section 101, et seq.

PURPOSE: The primary purpose for providing the information on this form is to request an electronic notification when USCIS accepts immigration form. The information you provide will be used to send you a text and/or email message.

DISCLOSURE: The information you provide is voluntary. However, failure to provide the requested information may prevent USCIS from providing you a text and/or email message receipting your immigration form.

ROUTINE USES: The information provided on this form will be used by and disclosed to DHS personnel and contractors in accordance with approved routine uses, as described in the associated published system of records notices [**DHS/USCIS-007 - Benefits Information System and DHS/USCIS-001 - Alien File (A-File) and Central Index System (CIS)**, which can be found at **www.dhs.gov/privacy**]. The information may also be made available, as appropriate for law enforcement purposes or in the interest of national security.

Complete this form and clip it on top of the first page of your immigration form(s).

Applicant/Petitioner Full Last Name	Applicant/Petitioner Full First Name	Applicant/Petitioner Full Middle Name
DE SOUZA	**Luciano Aparecido**	**N/A**

Email Address	Mobile Phone Number (Text Message)
luapbr@gmail.com	

Notice of Entry of Appearance as Attorney or Accredited Representative

Department of Homeland Security

DHS Form G-28
OMB No. 1615-0105
Expires 05/31/2021

Part 1. Information About Attorney or Accredited Representative

1. USCIS Online Account Number (if any)

► 0 0 7 4 9 2 6 2 5 4 3 8

Name of Attorney or Accredited Representative

2.a. Family Name (Last Name): HAVERROTH SILVA

2.b. Given Name (First Name): Otavio

2.c. Middle Name: N/A

Address of Attorney or Accredited Representative

3.a. Street Number and Name: PO Box 90487

3.b. ☐ Apt. ☐ Ste. ☐ Flr. N/A

3.c. City or Town: San Diego

3.d. State: CA **3.e.** ZIP Code: 92169 *(USPS ZIP Code Lookup)*

3.f. Province: N/A

3.g. Postal Code: N/A

3.h. Country: USA

Contact Information of Attorney or Accredited Representative

4. Daytime Telephone Number: 5102419336

5. Mobile Telephone Number (if any): 5102419336

6. Email Address (if any): otavio@legalhs.com

7. Fax Number (if any): N/A

Part 2. Eligibility Information for Attorney or Accredited Representative

Select **all applicable** items.

1.a. ☒ I am an attorney eligible to practice law in, and a member in good standing of, the bar of the highest courts of the following states, possessions, territories, commonwealths, or the District of Columbia. If you need extra space to complete this section, use the space provided in **Part 6. Additional Information**.

Licensing Authority: California

1.b. Bar Number (if applicable): 343486

1.c. I (select **only one** box) ☒ am not ☐ am subject to any order suspending, enjoining, restraining, disbarring, or otherwise restricting me in the practice of law. If you are subject to any orders, use the space provided in **Part 6. Additional Information** to provide an explanation.

1.d. Name of Law Firm or Organization (if applicable): HS Law Corp

2.a. ☐ I am an accredited representative of the following qualified nonprofit religious, charitable, social service, or similar organization established in the United States and recognized by the Department of Justice in accordance with 8 CFR part 1292.

2.b. Name of Recognized Organization: N/A

2.c. Date of Accreditation (mm/dd/yyyy): N/A

3. ☐ I am associated with N/A, the attorney or accredited representative of record who previously filed Form G-28 in this case, and my appearance as an attorney or accredited representative for a limited purpose is at his or her request.

4.a. ☐ I am a law student or law graduate working under the direct supervision of the attorney or accredited representative of record on this form in accordance with the requirements in 8 CFR 292.1(a)(2).

4.b. Name of Law Student or Law Graduate: N/A

Part 3. Notice of Appearance as Attorney or Accredited Representative

If you need extra space to complete this section, use the space provided in **Part 6. Additional Information**.

This appearance relates to immigration matters before (select **only one** box):

1.a. ☒ U.S. Citizenship and Immigration Services (USCIS)

1.b. List the form numbers or specific matter in which appearance is entered.

I-140, ETA 9089

2.a. ☐ U.S. Immigration and Customs Enforcement (ICE)

2.b. List the specific matter in which appearance is entered.

3.a. ☐ U.S. Customs and Border Protection (CBP)

3.b. List the specific matter in which appearance is entered.

4. Receipt Number (if any)

►

5. I enter my appearance as an attorney or accredited representative at the request of the (select **only one** box):

☐ Applicant ☒ Petitioner ☐ Requestor

☐ Beneficiary/Derivative ☐ Respondent (ICE, CBP)

Information About Client (Applicant, Petitioner, Requestor, Beneficiary or Derivative, Respondent, or Authorized Signatory for an Entity)

6.a. Family Name (Last Name): DE SOUZA

6.b. Given Name (First Name): Luciano Aparecido

6.c. Middle Name: N/A

7.a. Name of Entity (if applicable)

N/A

7.b. Title of Authorized Signatory for Entity (if applicable)

N/A

8. Client's USCIS Online Account Number (if any)

► N/A

9. Client's Alien Registration Number (A-Number) (if any)

► A- N/A

Client's Contact Information

10. Daytime Telephone Number

+55 (11) 98174-6761

11. Mobile Telephone Number (if any)

+55 (11) 98174-6761

12. Email Address (if any)

luapbr@gmail.com

Mailing Address of Client

NOTE: Provide the client's mailing address. **Do not** provide the business mailing address of the attorney or accredited representative **unless** it serves as the safe mailing address on the application or petition being filed with this Form G-28.

13.a. Street Number and Name: PO Box 90487

13.b. ☐ Apt. ☐ Ste. ☐ Flr. N/A

13.c. City or Town: San Diego

13.d. State: CA **13.e.** ZIP Code: 92169

13.f. Province: N/A

13.g. Postal Code: N/A

13.h. Country

USA

Part 4. Client's Consent to Representation and Signature

Consent to Representation and Release of Information

I have requested the representation of and consented to being represented by the attorney or accredited representative named in **Part 1.** of this form. According to the Privacy Act of 1974 and U.S. Department of Homeland Security (DHS) policy, I also consent to the disclosure to the named attorney or accredited representative of any records pertaining to me that appear in any system of records of USCIS, ICE, or CBP.

Part 4. Client's Consent to Representation and Signature (continued)

Options Regarding Receipt of USCIS Notices and Documents

USCIS will send notices to both a represented party (the client) and his, her, or its attorney or accredited representative eliver through mail or electronic delivery. USCIS will send all secure identity documents and Travel Documents in the client's U.S. mailing address.

If you want to have notices and/or secure identity documents sent to your attorney or accredited representative of record rather than to you, please select **all applicable** ietem below. You may change these elections through written notice to USCIS.

1.a. ☒ I request that USCIS send original notices on an application or petition to the business address of my attorney or accredited representative as listed in this form.

1.b. ☒ I request that USCIS send any secure identity document (Permanent Resident Card, Employment Authorization Document, or Travel Document) that I receive to the U.S. business address of my attorney or accredited representative (or to a designated nalitary or diplomatic address in a foreign country (if permitted)).

NOTE: If your notice contains from I-94, Arrival-Departure Record, USCIS will send the notice to the U.S. business address of your attorney or accredited representative. If you would rather have your Form I-94 rent directly to you, select **Item Number L.e.**

1.e. ☐ I request that USCIS send my notice containing From I-94 to me at my U.S. mailing address.

Signature of Client or Authorized Signatory for an Entity

2.a. Signature of Client or Authorized Signatory for an Entity

➡ Lucas A. de Souza

2.b. Date of Signature (mm/dd/yyyy) 04/24/2026

Part 5. Signature of Attorney or Accredited Representative

I have read and understand the regulations and conditions contained in 8 CFR 103.2 and 292 governing appearances and representation before DHS. I declare under penalty of perjury under the laws of the United States that the information I have provided on this form is true and correct.

1. a. Signature of Attorney or Accredited Representative

1.b. Date of Signature (mm/dd/yyyy) 04/24/2026

2.a. Signature of Law Student or Law Graduate

N/A

2.b. Date of Signature (mm/dd/yyyy) N/A

Part 6. Additional Information

If you need extra space to provide any additional information within this form, use the space below. If you need more space than what is provided, you may make copies of this page to complete and file with this form or attach a separate sheet of paper. Type or print your name at the top of each sheet; indicate the **Page Number**, **Part Number**, and **Item Number** to which your answer refers; and sign and date each sheet.

1.a Family Name (Last Name): DE SOUZA

1.b. Given Name (First Name): Luciano Aparecido

1.c. Middle Name: N/A

2.a. Page Number: N/A **2.b.** Part Number: N/A **2.c.** Item Number: N/A

2.d. N/A

3.a. Page Number: N/A **3.b.** Part Number: N/A **3.c.** Item Number: N/A

3.d. N/A

4.a. Page Number: N/A **4.b.** Part Number: N/A **4.c.** Item Number: N/A

4.d. N/A

5.a. Page Number: N/A **5.b.** Part Number: N/A **5.c.** Item Number: N/A

5.d. N/A

6.a. Page Number: N/A **6.b.** Part Number: N/A **6.c.** Item Number: N/A

6.d. N/A

Immigrant Petition for Alien Workers

Department of Homeland Security
U.S. Citizenship and Immigration Services

USCIS
Form I-140
OMB No. 1615-0015
Expires 02/28/2027

For USCIS Use Only	Fee Stamp	Priority Date	Consulate	Action Block

Classification

- ☐ 203(b)(1)(A) Alien of Extraordinary Ability
- ☐ 203(b)(1)(B) Outstanding Professor or Researcher
- ☐ 203(b)(1)(C) Multinational Executive or Manager
- ☐ 203(b)(2) Member of Professions with Advanced Degree/Exceptional Ability
- ☐ 203(b)(3)(A)(i) Skilled Worker
- ☐ 203(b)(3)(A)(ii) Professional
- ☐ 203(b)(3)(A)(iii) Other Worker

Certification

- ☐ National Interest Waiver (NIW)
- ☐ Schedule A, Group I
- ☐ Schedule A, Group II

Remarks

To be completed by an Attorney or Accredited Representative (if any).	☒ Select this box if Form G-28 or Form G-28I is attached.	Attorney State Bar Number (if applicable)	Attorney or Accredited Representative USCIS Online Account Number (if any)
	☒	343486	007492625438

► **START HERE - Type or print in black ink.**

Part 1. Information About the Person or Organization Filing This Petition

If an individual is filing this petition, answer **Item Numbers 1.a. - 1.c.** If a company or organization is filing this petition, answer **Item Number 2.**

1.a. Family Name (Last Name): DE SOUZA

1.b. Given Name (First Name): Luciano Aparecido

1.c. Middle Name: N/A

2. Company or Organization Name: N/A

Mailing Address

3.a. In Care Of Name: Otavio Haverroth Silva

3.b. Street Number and Name: PO Box 90487

3.c. ☐ Apt. ☐ Ste. ☐ Flr. N/A

3.d. City or Town: San Diego

3.e. State: CA **3.f.** ZIP Code: 92169

3.g. Province: N/A

3.h. Postal Code: N/A

3.i. Country: USA

Other Information

4. IRS Employer Identification Number (EIN) ► N/A

5. Are you a nonprofit organized as tax exempt or a governmental research organization? ☐ Yes ☒ No

6. Do you currently employ a total of 25 or fewer full-time equivalent employees in the United States, including all affiliates or subsidiaries of this company/organization? ☒ Yes ☐ No

7. U.S. Social Security Number (SSN) (if any) ► N/A

8. USCIS Online Account Number (if any) ► N/A

Part 2. Petition Type

This petition is being filed for (select **only one** box):

1.a. ☐ An alien of extraordinary ability.

1.b. ☐ An outstanding professor or researcher.

1.c. ☐ A multinational executive or manager.

1.d. ☐ A member of the professions holding an advanced degree or an alien of exceptional ability (who is **NOT** seeking a National Interest Waiver (NIW)).

1.e. ☐ A professional (at a minimum, possessing a bachelor's degree or a foreign degree equivalent to a U.S. bachelor's degree).

Part 2. Petition Type (continued)

1.f. ☐ A skilled worker (requiring at least two years of specialized training or experience).

1.g. ☐ Any other worker (requiring less than two years of training or experience).

1.h. ☒ An alien applying for an NIW (who **IS** a member of the professions holding an advanced degree or an alien of exceptional ability).

This petition is being filed (select **only one** box):

2.a. ☐ To amend a previously filed petition.

Previous Petition Receipt Number

► N/A

2.b. ☐ For the Schedule A, Group I or II designation.

Part 3. Information About the Person for Whom You Are Filing

1.a. Family Name (Last Name): DE SOUZA

1.b. Given Name (First Name): Luciano Aparecido

1.c. Middle Name: N/A

Mailing Address

2.a. In Care Of Name: Otavio Haverroth Silva

2.b. Street Number and Name: PO Box 90487

2.c. ☐ Apt. ☐ Ste. ☐ Flr. N/A

2.d. City or Town: San Diego

2.e. State: CA **2.f.** ZIP Code: 92169

2.g. Province: N/A

2.h. Postal Code: N/A

2.i. Country: USA

Other Information

3. Date of Birth (mm/dd/yyyy): 08/15/1979

4. City/Town/Village of Birth: Sao Bernardo do Campo

5. State or Province of Birth: Sao Paulo

6. Country of Birth: Brazil

7. Country of Citizenship or Nationality: Brazil

8. Alien Registration Number (A-Number) (if any)

► A- N/A

9. U.S. SSN (if any) ► N/A

Information About His or Her Last Arrival in the United States

If the person for whom you are filing is in the United States, provide the following information.

10. Date of Last Arrival (mm/dd/yyyy): N/A

11.a. Form I-94 Arrival-Departure Record Number

► N/A

11.b. Expiration Date of Authorized Stay Shown on Form I-94 (mm/dd/yyyy): N/A

11.c. Status on Form I-94 (for example, class of admission, or paroled, if paroled): N/A

12. Passport Number: N/A

13. Travel Document Number: N/A

14. Country of Issuance for Passport or Travel Document: N/A

15. Expiration Date for Passport or Travel Document (mm/dd/yyyy): N/A

Part 4. Processing Information

Provide the following information for the person named in **Part 3.** (select **only one** box):

1.a. ☒ Alien will apply for a visa abroad at a U.S. Embassy or U.S. Consulate at:

1.b. City or Town: Rio de Janeiro

1.c. Country: Brazil

2.a. ☐ Alien is in the United States and will apply for adjustment of status to that of lawful permanent resident.

Part 4. Processing Information (continued)

2.b. Alien's current country of residence or, if now in the United States, last country of permanent residence abroad.

Brazil

If you provided a United States address in **Part 3.**, provide the person's foreign address in **Item Numbers 3.a. - 3.f.**:

3.a. Street Number and Name: 3333 Paes de Barros Ave

3.b. ☐ Apt. ☐ Ste. ☐ Flr. N/A

3.c. City or Town: Sao Paulo

3.d. Province: Sao Paulo

3.e. Postal Code: 03149100

3.f. Country

Brazil

If the person's native alphabet is other than Roman letters, type or print the person's foreign name and address in the native alphabet in **Item Numbers 4.a. - 5.g.**:

4.a. Family Name (Last Name): N/A

4.b. Given Name (First Name): N/A

4.c. Middle Name: N/A

Mailing Address

5.a. In Care Of Name

N/A

5.b. Street Number and Name: N/A

5.c. ☐ Apt. ☐ Ste. ☐ Flr.

5.d. City or Town: N/A

5.e. Province: N/A

5.f. Postal Code: N/A

5.g. Country

N/A

If you answer "Yes" to **Item Numbers 6.a. - 10.**, provide the case number, office location, date of decision, and disposition of the decision in the space provided in **Part 11. Additional Information**.

6.a. Are you filing any other petitions or applications with this Form I-140? ☐ Yes ☒ No

6.b. If you answered "Yes" **to Item Number 6.a.**, select all applicable boxes:

- ☐ Form I-485
- ☐ Form I-131
- ☐ Form I-765
- ☐ Other (Provide an explanation in **Part 11. Additional Information**.)

7. Is the person for whom you are filing in removal proceedings? ☐ Yes ☒ No

8. Has any immigrant visa petition ever been filed by or on behalf of this person? ☐ Yes ☒ No

9. Are you filing this petition without an original labor certification because the original labor certification was previously submitted in support of another Form I-140? ☐ Yes ☒ No

10. If you are filing this petition without an original labor certification, are you requesting that U.S. Citizenship and Immigration Services (USCIS) request a duplicate labor certification from the Department of Labor (DOL)? ☐ Yes ☒ No

Part 5. Additional Information About the Petitioner

Type of petitioner (select **only one** box):

1.a. ☐ Employer

1.b. ☒ Self

1.c. ☐ Other (For example, Lawful Permanent Resident, U.S. citizen or any other person filing on behalf of the alien)

N/A

If a company or an organization is filing this petition, provide the following information:

2. Type of Business

N/A

3. Date Established (mm/dd/yyyy): N/A

4. Current Number of U.S. Employees: N/A

5. Gross Annual Income $ N/A

6. Net Annual Income $ N/A

7. NAICS Code ► N/A

8. Labor Certification DOL Case Number

N/A

Part 5. Additional Information About the Petitioner (continued)

9. Labor Certification DOL Filing Date (mm/dd/yyyy)

N/A

10. Labor Certification Expiration Date (mm/dd/yyyy)

N/A

If an individual is filing this petition, provide the following information.

11. Occupation

CEO

12. Annual Income $ N/A

Part 6. Basic Information About the Proposed Employment

1. Job Title

General and Operations Managers

2. SOC Code ▶ 11 - 1021

3. Nontechnical Job Description

See page 8.

4. Is this a full-time position? ☒ Yes ☐ No

5. If the answer to **Item Number 4.** is "No," how many hours per week for the position?

N/A

6. Is this a permanent position? ☒ Yes ☐ No

7. Is this a new position? ☒ Yes ☐ No

8. Wages (Specify hour, week, month, or year):

$ 56,000 per year

Worksite Location

For **Item Numbers 9.a. - 9.e.**, provide the address where the person will work if different from the address provided in **Part 1.**

9.a. Street Number and Name: To be determined

9.b. ☐ Apt. ☐ Ste. ☐ Flr. To be determined

9.c. City or Town: Austin

9.d. State: TX **9.e.** ZIP Code: To be determined

Part 7. Information About the Spouse and All Children of the Person for Whom You Are Filing

For **Part 7.**, provide information on the spouse and all children related to the individual for whom you are filing this petition. Also, note if the individual will apply for a visa abroad or adjustment of status as the dependent of the individual for whom the petition is filed. If you need extra space to provide information about additional family members, use the space provided in **Part 11. Additional Information**.

Person 1

1.a. Family Name (Last Name): ARICA FIORITI SOUZA

1.b. Given Name (First Name): Cristiane

1.c. Middle Name: N/A

2. Date of Birth (mm/dd/yyyy): 08/11/1976

3. Country of Birth: Brazil

4. Relationship: Spouse

5. Is he or she applying for adjustment of status? ☐ Yes ☒ No

6. Is he or she applying for a visa abroad? ☒ Yes ☐ No

Person 2

7.a. Family Name (Last Name): FIORITI SOUZA

7.b. Given Name (First Name): Alana

7.c. Middle Name: N/A

8. Date of Birth (mm/dd/yyyy): 06/19/2016

9. Country of Birth: Brazil

10. Relationship: Daughter

11. Is he or she applying for adjustment of status? ☐ Yes ☒ No

12. Is he or she applying for a visa abroad? ☒ Yes ☐ No

Part 7. Information About Spouse and All Children of the Person for Whom You Are Filing (continued)

Person 3

13.a. Family Name (Last Name): FIORITI SOUZA

13.b. Given Name (First Name): Emilly

13.c. Middle Name: N/A

14. Date of Birth (mm/dd/yyyy): 09/15/2014

15. Country of Birth: Brazil

16. Relationship: Daughter

17. Is he or she applying for adjustment of status? ☐ Yes ☒ No

18. Is he or she applying for a visa abroad? ☒ Yes ☐ No

Person 4

19.a. Family Name (Last Name): N/A

19.b. Given Name (First Name): N/A

19.c. Middle Name: N/A

20. Date of Birth (mm/dd/yyyy): N/A

21. Country of Birth: N/A

22. Relationship: N/A

23. Is he or she applying for adjustment of status? ☐ Yes ☐ No

24. Is he or she applying for a visa abroad? ☐ Yes ☐ No

Person 5

25.a. Family Name (Last Name): N/A

25.b. Given Name (First Name): N/A

25.c. Middle Name: N/A

26. Date of Birth (mm/dd/yyyy): N/A

27. Country of Birth: N/A

28. Relationship: N/A

29. Is he or she applying for adjustment of status? ☐ Yes ☐ No

30. Is he or she applying for a visa abroad? ☐ Yes ☐ No

Person 6

31.a. Family Name (Last Name): N/A

31.b. Given Name (First Name): N/A

31.c. Middle Name: N/A

32. Date of Birth (mm/dd/yyyy): N/A

33. Country of Birth: N/A

34. Relationship: N/A

35. Is he or she applying for adjustment of status? ☐ Yes ☐ No

36. Is he or she applying for a visa abroad? ☐ Yes ☐ No

Part 8. Contact Information, Certification, and Signature of the Petitioner or Authorized Signatory

Petitioner or Authorized Signatory's Contact Information

1.a. Petitioner's or Authorized Signatory's Family Name (Last Name)

DE SOUZA

1.b. Petitioner's or Authorized Signatory's Given Name (First Name)

Luciano Aparecido

2. Petitioner's or Authorized Signatory's Title

N/A

3. Petitioner's or Authorized Signatory's Daytime Telephone Number

+55 (11) 98174-6761

4. Petitioner's or Authorized Signatory's Mobile Telephone Number (if any)

+55 (11) 98174-6761

5. Petitioner's or Authorized Signatory's Email Address (if any)

luapbr@gmail.com

Petitioner's or Authorized Signatory's Certification and Signature

If filing this petition on behalf of an organization, I certify that I am authorized to do so by the organization:

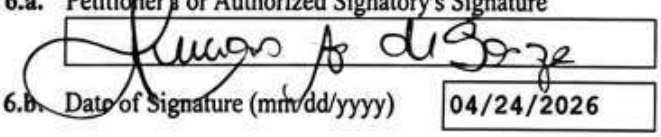
a. I reviewed and provided or autharized all of the responses and information in my petition;

b. I understood all of the responses and information contained in, and submitted with, my petition; and

c. All of the responses and information were complete, true, and correct at the time of filing.

Furthermore, I authorize the release of any information from any and all of my records as authorized signatory and the petitioner's records that USCIS may need to determine the petitioner's eligibility for an immigration request and to other entities and persons where necessary for the administration and enforcement of U.S. Immigration law.

6.a. Petitioner's or Authorized Signatory's Signature



6.b. Date of Signature (mm/dd/yyyy) 04/24/2026

Part 9. Interpreter's Contact Information, Certification, and Signature

Interpreter's Full Name

1.a. Interpreter's Family Name (Last Name)

N/A

1.b. Interpreter's Given Name (First Name)

N/A

2. Interpreter's Business or Organization Name

N/A

Interpreter's Contact Information

3. Interpreter's Daytime Telephone Number

N/A

4. Interpreter's Mobile Telephone Number (if any)

N/A

5. Interpreter's Email Address (if any)

N/A

Interpreter's Certification and Signature

I certify, under penalty of perjury, that I am fluent in English and N/A and I have interpreted every question on the petition and Instructions and interpreted the petitioner's or authorized signatory's answers to the questions in that language, and the petitioner or authorized signatory informed me that they understood every instruction, question, and answer on the petition.

6.a. Interpreter's Signature

N/A

6.b. Date of Signature (mm/dd/yyyy) N/A

Part 10. Contact Information, Certification, and Signature of the Person Preparing this Petition, if Other Than the Petitioner or Authorized Signatory

Preparer's Full Name

1. Preparer's Family Name (Last Name)

HAVERROTH SILVA

Preparer's Given Name (First Name)

Otavio

2. Preparer's Business or Organization Name

HS Law Corp

Preparer's Contact Information

3. Preparer's Daytime Telephone Number

5102419336

4. Preparer's Mobile Telephone Number (if any)

5102419336

5. Preparer's Email Address (if any)

otavio@legalhs.com

Preparer's Certification and Signature

I certify, under penalty of perjury, that I prepared this petition for the petitioner or authorized signatory at their request and with express consent and that all of the responses and information contained in and submitted with the petition are complete, true, and correct and reflects only information provided by the petitioner or authorized signatory. The petitioner or authorized signatory reviewed the responses and information and informed me that they understand the responses and information in or submitted with the petition.

6. Preparer's Signature



Date of Signature (mm/dd/yyyy) 04/24/2026

Part 11. Additional Information

If you need extra space to provide any additional information within this petition, use the space below. If you need more space than what is provided, you may make copies of this page to complete and file with this petition or attach a separate sheet of paper. Type or print your name and A-Number (if any) at the top of each sheet; indicate the **Page Number**, **Part Number**, and **Item Number** to which your answer refers; and sign and date each sheet.

1. Family Name (Last Name): DE SOUZA

Given Name (First Name): Luciano Aparecido

Middle Name: N/A

2. IRS EIN ▶ N/A

3.

Page Number	Part Number	Item Number
4	6	3

Leads the company's growth and operations in the U.S. market, overseeing project delivery to ensure quality, timelines, and budgets are met. Manages key client relationships, coordinates cross-functional teams, and supports business development and partnerships.

4.

Page Number	Part Number	Item Number
N/A	N/A	N/A

N/A

5.

Page Number	Part Number	Item Number
N/A	N/A	N/A

N/A

6.

Page Number	Part Number	Item Number
N/A	N/A	N/A

N/A

7.

Page Number	Part Number	Item Number
N/A	N/A	N/A

N/A

Employment OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Final Determination: Permanent Employment Certification Approval
U.S. Department of Labor

PERMANENT EMPLOYMENT CERTIFICATION APPROVAL

A. U.S. Government Agency Use Only

Pursuant to the provisions of Sections 212(a)(5)(A) of the Immigration and Nationality Act, as amended, the Department hereby certifies that there are not sufficient workers who are able, willing, and qualified, and who will be available at the time of application for a visa and admission into the United States and place needed to fill the job opportunities for which certification is sought, and the permanent employment of the foreign worker will not adversely affect the wages and working conditions of workers in the United States similarly employed.

Therefore, by virtue of the signature below, the Department hereby acknowledges granting certification for the following *Application for Permanent Employment Certification* (Form ETA-9089):

1. DOL Case Number		2. Case Status
3. Employer Legal Business Name		4. Employer FEIN
5. Foreign Worker's Last (family) Name		
6. Foreign Worker's First (given) Name		
7. Foreign Worker's Middle Name(s)		
8. Job Title		
9. SOC Code	10. SOC Occupational Title	
Labor Certification Validity Information		
11. Filing Date	12. Determination Date	13. Expiration Date
14. Department of Labor Office of Foreign Labor Certification *(electronic signature)*		

Pursuant to 20 CFR 656, the aforementioned permanent labor certification is valid only for the job opportunity, the foreign worker, and the area of intended employment specified on the approved Form ETA-9089, including all appendices and any modifications approved by the Department. The aforementioned filing date on this approved *Application for Permanent Employment Certification*, established under 20 CFR 656.17(c), may be used as a priority date by the Department of Homeland Security and the Department of State, as appropriate. This approved *Application for Permanent Employment Certification* will expire if not filed in support of *Immigrant Petition for Alien Workers* (Form I-140) with the Department of Homeland Security by the aforementioned expiration date.

The foreign worker covered by this approved *Application for Permanent Employment Certification* has declared under Section B below, under penalty of perjury, that the foreign worker has read and reviewed every page of Appendix A for this approved Form ETA-9089, takes full responsibility for the accuracy of all information contained therein, and intends to accept permanent employment in the job opportunity specified on the approved Form ETA-9089, including all appendices, offered by the employer if granted a visa or an adjustment of status based on this permanent labor certification.

The employer covered by this approved *Application for Permanent Employment Certification* has declared under Section D below under penalty of perjury that it has read and reviewed every page of this approved Form ETA-9089, including all appendices, and takes full responsibility for the accuracy of all information contained therein and all documentation supporting this approved *Application for Permanent Employment Certification*, including any representations made by the employer's authorized preparer, agent or attorney, as applicable.

OMB Pnattovad: 1205-8081
Expiration Date 02/29/2029

Application for Permanent Employment Certification
Form ETA-9089 – Final Determination, Permanent Laber Certification Approval
U.S. Department of Labor

B. Foreign Worker Declaration

I declare under persiiry of perjury that I have read and reviewed all information contained in Appendix A of this approved Form ETA-9089, and that to the nest of my knowledge the information contained therein in true and accurate. I understand that to knowingly and/or wilffully furnish materially false maoriailsin in the preparation of this form and any supplement thereto or to aet, abet, or counsel consser to do so is a federal another punishable by fines, imprisonment, or osah *(18 U.S.C. 2. 1501, 1546, 1621)*.

I further declare that I am the person identified under Section A. Fectis 5. 6, and 7 above. I did not participate in any activities involving the interviewing or consvarration of U.S. workers and tinavd to ascept permanent employment of the job opportunity reccured on this approved From ETA-9089, including all appendices, offered by the employer if granted a tree to an adjustment of action based on this permanent laber certification.

1. Signature *	2. Date Signed *
Luciano M de Souza	04/24/2026

C. Attorney or Agent Declaration

I declare under persiiry of perjury that I am an attorner for the employer, or that I am an employee of, or hired by, the employer listed in Section C of the Form ETA-9089, and that I have been designated by that employer in accordation with 20 CFR 656.10(b) to act on its behaff in connection with this application.

I hereby cersify that I have provided to the employer the entire Form ETA-9089, appendices, and all supporting documentation by review and to the best of my knowledge the information contained herein is Irue and accurate, including the employer's declaration regarding actorries that I have undertaken on the employer's behalf in connection with this application. I understand that to knowingly and/or witffully furnish materially talse information in the preparation of this form and any supplement hereto or to aet, abet, or counsel conster to do so is a federal afferise punishable by fines, imprisonment, or oobt *(18 U.S.C. 2. 1501, 1546, 1621)*.

1. Attorney of Agent's Last (family) Name *	2. First (given) Name *	3. Middle Initial §
HAVERROTH SILVA	Otavio	N/A
4. Firm/Business Name §		
HS Law Corp		
5. Signature *		6. Date Signed *
		04/24/2026

D. Employer Declaration

I hereby declıarate the penry or attorney identified in Section C (if any) of the Form ETA-9089 to represent me for the purpose of labor certification and, by virtue of my signature in Field 5 below. **I take full responslbllity** for the accuracy of any representations made by my agent or attorney, and my designated preparer identified in Section C above, on every page of the Form ETA-9089, including all appendices, and documentation supporting this application.

I declare undre permity of penury that I have read and reviewed this application, including every page of the Form ETA-9089, appendices, and supporting documentation, and that to the best of my knowledge the information contemed therein is true and accurate. I understand that to knowledly and/or witffully furnish materially takle information in the preparation of this form and any supplement thereto or to adl, abet, or counsel another to do so is a federal sederal punishable by fines, *imprisonment, or coat (18 U S.C. 2. 1041, 1546, 1621)*.

1. Last (family) Name *	2. First (given) Name *	3. Middle Initial §
4. Title *		
5. Signature *		6. Date Signed *

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: XX/XX/XXXX

Application for Permanent Employment Certification
Form ETA-9089 – Appendix A: Foreign Worker Information
U.S. Department of Labor

FOREIGN WORKER INFORMATION

A. Foreign Worker Contact Information

1. Foreign Worker's Last (family) Name * DE SOUZA		
2. Foreign Worker's First (given) Name * Luciano Aparecido		
3. Foreign Worker's Middle Name(s) * N/A		
4. Address 1 *(current)* * 3333 Paes de Barros Ave		
5. Address 2 *(apartment/suite/floor and number)* § N/A		
6. City * Sao Paulo	7. State * N/A	8. Postal Code * 03149100
9. Country * Brazil	10. Province § Sao Paulo	
11. Date of Birth *(mm/dd/yyyy)* * 08/15/1979	12. Class of admission * N/A	13. Alien registration number (A#) (if applicable) * N/A
14. Country of birth * Brazil		
15. Country of citizenship or nationality * Brazil		

B. Foreign Worker Education §

a. Educational Attainment Information 1

1. Education: U.S. diploma/degree attained relevant to the job opportunity. ☐ None ☐ High School/GED ☐ Associate ☐ Bachelor's ☐ Master's ☐ Doctorate (PhD) ■ Other degree (JD, MD, etc.)	
1a. If "Other degree" in question 1, specify the diploma/degree attained Postgraduate Degree in Business Logistics	
1b. Specify major(s) and/or field(s) of study (may list more than one related major and more than one field) Business Logistics; Global Logistics; Supply Chain; Competitive Strategies	
1c. Name of institution that issued the degree/diploma Getulio Vargas Foundation (FGV)	
1d. Name of country of institution identified in question 1c Brazil	1e. Month/year attained (*mm/yyyy*) 09/2004

b. Educational Attainment Information 2

1. Education: U.S. diploma/degree attained relevant to the job opportunity. ☐ None ☐ High School/GED ☐ Associate ■ Bachelor's ☐ Master's ☐ Doctorate (PhD) ☐ Other degree (JD, MD, etc.)	
1a. If "Other degree" in question 1, specify the diploma/degree attained N/A	
1b. Specify major(s) and/or field(s) of study (may list more than one related major and more than one field) Business Administration; Foreign Trade; Foreign Trade Systems; International Economics; Customs and Tax Legislation	
1c. Name of institution that issued the degree/diploma Methodist University of São Paulo	
1d. Name of country of institution identified in question 1c Brazil	1e. Month/year attained (*mm/yyyy*) 03/2003

PERM Case Number: _____ Case Status: _____ Determination Date: _____ Expiration Date: _____

B. Foreign Worker Education (continued)

c. Educational Attainment Information 3

1. Education: U.S. diploma/degree attained relevant to the job opportunity. ▣ None ☐ High School/GED ☐ Associate ☐ Bachelor's ☐ Master's ☐ Doctorate (PhD) ☐ Other degree (JD, MD, etc.)
1a. If "Other degree" in question 1, specify the diploma/degree attained
1b. Specify major(s) and/or field(s) of study (may list more than one related major and more than one field)
1c. Name of institution that issued the degree/diploma

1d. Name of country of institution identified in question 1c	1e. Month/year attained (*mm/yyyy*)

d. Educational Attainment Information 4

1. Education: U.S. diploma/degree attained relevant to the job opportunity. ▣ None ☐ High School/GED ☐ Associate's ☐ Bachelor's ☐ Master's ☐ Doctorate (PhD) ☐ Other degree (JD, MD, etc.)
1a. If "Other degree" in question 1, specify the diploma/degree attained
1b. Specify major(s) and/or field(s) of study (may list more than one related major and more than one field)
1c. Name of institution that issued the degree/diploma

1d. Name of country of institution identified in question 1c	1e. Month/year attained (*mm/yyyy*)

e. Educational Attainment Information 5

1. Education: U.S. diploma/degree attained relevant to the job opportunity. ▣ None ☐ High School/GED ☐ Associate's ☐ Bachelor's ☐ Master's ☐ Doctorate (PhD) ☐ Other degree (JD, MD, etc.)
1a. If "Other degree" in question 1, specify the diploma/degree attained
1b. Specify major(s) and/or field(s) of study (may list more than one related major and more than one field)
1c. Name of institution that issued the degree/diploma

1d. Name of country of institution identified in question 1c	1e. Month/year attained (*mm/yyyy*)

C. Foreign Worker Training Qualifications §

a. Training, Certification(s), and/or License(s) Information 1

1. Name of institution/school/training provider		
SAP Brasil		
1a. Name of training, coursework, experience received		
SCM631: Additional Topics in Warehouse Management		
1b. Training/certifications/licenses attained (if applicable)		
N/A		
1c. Start date of training (*mm/yyyy*)	1d. End date of training (*mm/yyyy*)	1e. Month/year awarded (*mm/yyyy*)
N/A	N/A	06/2006

b. Training, Certification(s), and/or License(s) Information 2

1. Name of institution/school/training provider		
SAP Brasil		
1a. Name of training, coursework, experience received		
SCM630: Warehouse Management		
1b. Training/certifications/licenses attained (if applicable)		
N/A		
1c. Start date of training (*mm/yyyy*)	1d. End date of training (*mm/yyyy*)	1e. Month/year awarded (*mm/yyyy*)
N/A	N/A	06/2006

c. Training, Certification(s), and/or License(s) Information 3

1. Name of institution/school/training provider		
SAP Brasil		
1a. Name of training, coursework, experience received		
SCM610: Delivery Processes		
1b. Training/certifications/licenses attained (if applicable)		
N/A		
1c. Start date of training (*mm/yyyy*)	1d. End date of training (*mm/yyyy*)	1e. Month/year awarded (*mm/yyyy*)
N/A	N/A	05/2006

D. Foreign Worker Training Qualifications §

a. Skills, Abilities, and Proficiencies 1

1. Name of employer/institution/school/training provider	
1a. Country	1b. State, territory, or province
1c. Description of specific skills, abilities, and/or proficiencies the foreign worker possesses or attained, which help establish whether the foreign worker meets the requirements identified for the job opportunity *(up to 1,500 characters)*	

b. Skills, Abilities, and Proficiencies 2

1. Name of employer/institution/school/training provider	
1a. Country	1b. State, territory, or province
1c. Description of specific skills, abilities, and/or proficiencies the foreign worker possesses or attained, which help establish whether the foreign worker meets the requirements identified for the job opportunity *(up to 1,500 characters)*	

E. Foreign Worker Work Experience §

a. Work Experience 1

1. Employer name E-IT Technologies			
1a. Address 1 Av. Paes de Barros, 3333			
1b. Address 2 Mooca			
1c. City or town Sao Paulo			1d. Postal code 03149-100
1e. Country Brazil	1f. State, territory, or province Sao Paulo		
1g. Job title CEO / Co-Founder			
1h. Start date *(mm/yyyy)* 10/2010	1i. End date *(mm/yyyy)* Current	1j. Present ■ Yes ☐ No	1k. Hours worked per week 40

1l. Job duties: Specify details of job (work tasks performed, use of tools/equipment, supervision, etc.) (*up to 3,500 characters*)

At E-IT Technologies, Luciano Aparecido de Souza served as CEO and Co-Founder, leading the operations of a software company specializing in add-on solutions for the SAP R/3 and SAP ECC ecosystem, with emphasis on logistics, tax, and foreign trade processes. He managed a multidisciplinary team of more than 40 employees and supported more than 70 multinational corporations. He directed the company's international expansion and the implementation of fiscal and customs compliance solutions in Brazil, Ecuador, Peru, Colombia, Chile, and Argentina. Furthermore, he led initiatives involving business control recovery and logistics integration.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Appendix C: Supplemental Information
U.S. Department of Labor

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	C	1a. Section Name or Category of Supplemental Information	Foreign Worker Training Qualifications

1b. Supplemental Information. *(up to 1,500 characters)*

Training, Certifications and/or License(s) Information

Name of Institution: SAP Brasil
Name of Training: SCM601: Processes in Logistics Execution
Month/Year awarded: 03/2006

B. Supplemental Information 2 §

1. Section and Item Number	C	1a. Section Name or Category of Supplemental Information	Foreign Worker Training Qualifications

1b. Supplemental Information. *(up to 1,500 characters)*

Training, Certifications and/or License(s) Information

Name of Institution: Aduaneiras
Name of Training: Foreign Exchange and International Banking Operations in Foreign Trade
Month/Year awarded: 08/2002

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Appendix C: Supplemental Information
U.S. Department of Labor

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	C	1a. Section Name or Category of Supplemental Information	Foreign Worker Training Qualifications

1b. Supplemental Information. *(up to 1,500 characters)*

Training, Certifications and/or License(s) Information

Name of Institution: Aduaneiras
Name of Training: International Transportation and Cargo Unitization
Month/Year awarded: 08/2002

B. Supplemental Information 2 §

1. Section and Item Number	C	1a. Section Name or Category of Supplemental Information	Foreign Worker Training Qualifications

1b. Supplemental Information. *(up to 1,500 characters)*

Training, Certifications and/or Licenses(s) Information

Name of Certification: Regional Council of Business Administration
Name of Certificate: Professional License
Month/year awarded: 11/2025

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	Foreign Worker Work Experience

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer Name: ContourGlobal
Employer Address: Rua James Joule, 65, 16° andar, conj. 161, Cidade Monções, São Paulo, SP, Brazil
Postal Code: 04576-080
Job Title: SAP Technical Leader
Start Date - End Date: 06/2015 – 05/2017
Job Duties: At ContourGlobal, Luciano Aparecido de Souza served as SAP Technical Leader for the NeoEnergia carve-out project, managing the acquisition of six companies. He configured SAP MM and SD modules for 15 industrial plants and implemented Brazilian tax and fiscal localization. He designed LSMW programs for large-scale data migration of master data and inventory balances while ensuring data integrity. Additionally, he led the re-implementation of the Fixed Assets (FI-AA) module, optimized inbound systems to reduce processing time, and trained Key Users in an English-speaking environment.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	Foreign Worker Work Experience

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer Name: Apex Tool Group, LLC
Employer Address: Avenida Liberdade, 4055, Iporanga, Sorocaba, SP, Brazil
Job Title: SAP Project Manager
Start Date - End Date: 06/2013 – 01/2014
Job Duties: At Apex Tool Group, LLC, Luciano Aparecido de Souza served as SAP Project Manager, leading the strategic delivery of SAP solutions. He managed quality assurance for MM, SD, and FI module implementations. As a Solution Architect, he evaluated technical proposals and designed integration strategies between ERP and legacy systems. Furthermore, he directed organizational change management processes resulting from new systemic implementations while ensuring adherence to project schedules.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	Foreign Worker Work Experience

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer Name: Schneider Electric
Employer Address: Avenida das Nações Unidas, 23223, Vila Almeida, São Paulo, SP, Brazil
Postal Code: 04795-907
Job Title: SAP Project Manager
Start Date - End Date: 01/2013 – 07/2013
Job Duties: At Schneider Electric, Luciano Aparecido de Souza served as SAP Project Manager, coordinating distributed teams across five sites in three Brazilian states. He reported project performance, risks, and critical issues directly to the Steering Committee. He tracked technical-development schedules, evaluated SAP solution proposals and legacy-system integrations, and worked in English in accordance with the company's international standards and methodologies.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	Foreign Worker Work Experience

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer Name: Voith AG
Employer Address: Rua Friedrich von Voith, 825, Jaraguá, São Paulo, SP, Brazil
Postal Code: 02995-000
Job Title: SAP MM Consultant
Start Date - End Date: 04/2009 – 02/2012
Job Duties: At Voith AG, Luciano Aparecido de Souza served as an SAP MM Consultant, configuring the Materials Management module to support paper and energy production processes. He executed Brazilian localization requirements, ensuring compliance with national fiscal and tax regulations in SAP ERP. He provided international support to users in the United States, managed ongoing system improvements, and prepared technical documentation and training for Key Users.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Appendix C: Supplemental Information
U.S. Department of Labor

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: GE Energy
Employer Address: Sao Paulo, Sao Paulo - Brazil
Job Title: SAP MM Consultant
Start date - End date: 10/2008 - 04/2009
Job Duties: Acted in the implementation of SAP 4.6C with a focus on architecture and process design (BBP Design) for the MM module, integrating the Brazilian localization and defining technical specifications for developments in ABAP language.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Osram Sylvania
Employer Address: 200 Ballardvale Street, Wilmington, Massachusetts 01887, USA
Job Title: SAP MM Consultant
Start date - End date: 03/2008 - 10/2008
Job Duties: Led the regional rollout of the SAP 4.6C system for Osram units in Peru, Colombia, and Ecuador.In recognition of outstanding commitment and successful project delivery, received a formal Diploma of Recognition awarded by Osram's Board of Directors.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Appendix C: Supplemental Information
U.S. Department of Labor

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Tenda Atacadao
Employer Address: 365 Professor Joao Cavalheiro Salem St, Guarulhos, SP Brazil
Postal Code: 07243-580
Job Title: SAP MM Consultant
Start date - End date: 01/2008 - 02/2008
Job Duties: Specialist responsible for implementing the MM-CBP module in SAP 4.7, performing complex technical adaptations to support retail planning requirements in an environment without the IS-Retail module. Developed special programs, including customized forecasting (Forecast), BADIs, and strategic reports to optimize the supply flow between the company's 10 stores and distribution center.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: 3 Coracoes S/A
Employer Address: 100 Santa Clara St, Eusebio, CE, Brazil, 61768-290
Job Title: SAP MM Consultant
Start date - End date: 09/2007 - 12/2007
Job Duties: Acted in the design and implementation of the Fixed Assets (FI-AA) module in SAP 4.7 for the second-largest coffee group in Brazil.Was responsible for the technical configuration of the Brazilian localization, handling critical issues such as CIAP and taxes (PIS/COFINS), as well as leading data migration through customized programs in ABAP language.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Prysmian
Employer Address: 1100 Pirelli Ave, Sorocaba, SP, Brazil, 18103-085
Job Title: SAP MM Consultant
Start date - End date: 06/2007 - 07/2007
Job Duties: Technical consulting focused on the design and implementation of the External Services Management (MM-SRV) sub-module in SAP 4.6C for the global leader in high-tech cables.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: B.GROB do Brasil
Employer Address: 1811 Caminho do mar Ave, Sao Bernardo do Campo, SP, Brazil
Postal Code: 09609-000
Job Title: SAP MM Consultant
Start date - End date: 08/2006 - 06/2007
Job Duties: Responsible for the design and configuration of the MM module in SAP 4.7 for the German machining centers multinational.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Appendix C: Supplemental Information
U.S. Department of Labor

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Gebruder Heller Maschinenfabrik GmbH
Employer Address: 250 Joaquim Machado St, Sorocaba, SP, Brazil, 18087-280
Job Title: SAP MM Consultant
Start date - End date: 08/2005 - 05/2006
Job Duties: Led the process design (BBP) and technical configuration of the Brazilian localization within the MM module for the German multinational. Responsible for configuring tax codes and withholding taxes, as well as developing customization documentation.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Petroflex
Employer Address: 425 Barao de Souza Leao St, Recife, PE, Brazil, 51030-300
Job Title: SAP MM / PWCE Consultant
Start date - End date: 01/2005 - 07/2005
Job Duties: Responsible for defining the Brazilian localization for import processes, system gap mapping, and leading data migration utilizing LSMW tools and customized ABAP programs for the company's three industrial plants.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Embraco
Employer Address: 925 Rui Barbosa St, Joinville, SC, Brazil, 89219-158
Job Title: SAP MM / PWCE Consultant
Start date - End date: 04/2004 - 06/2004
Job Duties: Implementation of an add-on solution focused on Foreign Trade processes to bridge gaps within the SAP Brazilian localization. Acted in program design, pricing configuration (Pricing), tax codes, and user training, integrating the solution with FI, MM, CO, and AM modules.

B. Supplemental Information 2 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: Videolar S/A
Employer Address: 5555 Torquato Tapajos Ave, Manaus, AM, Brazil, 69041-025
Job Title: SAP MM Consultant
Start date - End date: 02/2004 - 04/2004
Job Duties: Technical leader in the restructuring and stabilization of the SAP 4.6C environment following failures in the original implementation. Performed the review of the organizational structure (Enterprise structure), redefinition of customized configurations, pricing and Brazilian localization configuration, ensuring business process continuity for AM, FI, MM, PP, and SD modules.

For Public Burden Statement, see the Instructions for Form ETA-9089.

OMB Approval: 1205-0451
Expiration Date: 02/28/2029

Application for Permanent Employment Certification
Form ETA-9089 – Appendix C: Supplemental Information
U.S. Department of Labor

SUPPLEMENTAL INFORMATION

A. Supplemental Information 1 §

1. Section and Item Number	E	1a. Section Name or Category of Supplemental Information	**Foreign Worker Work Experience**

1b. Supplemental Information. *(up to 1,500 characters)*

Work Experience

Employer name: CMR Industria e Comercio Ltda
Employer Address: 2000 Antonieta Piva Barranqueiros Ave, Jundiai, SP, Brazil
Postal Code: 13213-009
Job Title: SAP MM / PWCE Consultant
Start date - End date: 07/2003 - 01/2004
Job Duties: Acted in the SAP 4.7 implementation for a textile industry with international operations. Responsible for process design (BBP), technical configuration of the materials management module, and Brazilian localization. Led data migration utilizing LSMW tools and customized ABAP programs, integrating the plant in Brazil with representative offices in Argentina and France.

B. Supplemental Information 2 §

1. Section and Item Number		1a. Section Name or Category of Supplemental Information	

1b. Supplemental Information. *(up to 1,500 characters)*

For Public Burden Statement, see the Instructions for Form ETA-9089.

SUMMARY OF COVER LETTER
Petitioner: DE SOUZA, Luciano Aparecido
Type of Petition: I-140, EB-2 National Interest Waiver
Classification Sought: Immigration and Nationality Act § 203(b)(2)(B)(i)

This petition is submitted on behalf of Mr. Luciano Aparecido de Souza, a business administration and enterprise-systems professional with more than fifteen years of progressive post-baccalaureate experience at the intersection of SAP architecture, logistics, foreign trade, procurement, electronic invoicing, regulatory integration, and business operations. He holds the foreign equivalent of a U.S. Bachelor of Business Administration, completed graduate study in Logistics, is certified as an SAP Solution Consultant, completed specialized SAP logistics training, and is professionally registered as an Administrator in São Paulo.

Mr. de Souza qualifies for EB-2 classification as a member of the professions holding the equivalent of an advanced degree because he possesses a U.S.-equivalent bachelor's degree followed by substantially more than five years of progressive experience in the specialty. The record also supports exceptional ability in business in the alternative. Under *Matter of Dhanasar*, 26 I&N Dec. 884 (AAO 2016), he seeks a National Interest Waiver to establish and lead E-IT Technologies in Austin, Texas, as its General and Operations Manager. The company will provide scalable SAP-integrated solutions and consulting frameworks for logistics, procurement, goods receipt, electronic invoicing, trade workflows, regulatory controls, and enterprise-system interoperability to multiple U.S. organizations.

Moreover, Mr. de Souza's proposed endeavor satisfies the three-prong test under *Dhanasar*:

Substantial Merit and National Importance: The endeavor will integrate and automate enterprise workflows that support manufacturing, supply chains, inventory, invoicing, and cross-border trade. Its reusable, multi-client, multi-sector design extends beyond one employer and is intended to expand from Texas across the United States. Official NIST, CBP, Treasury, Census, BLS, and Texas materials confirm the broader importance of interoperable manufacturing data, supply-chain visibility, electronic invoicing, trade modernization, and the related professional capabilities.

Well-Positioned to Advance the Proposed Endeavor: Mr. de Souza combines directly related education, SAP certification, specialized training, and longstanding entrepreneurial leadership. Government corporate records identify him as E-IT Technologies' administrator and 85-percent owner; accountant-certified schedules document more than R$122.7 million in combined gross revenue for E-IT Technologies and E-IT Services over the reported periods. The record also documents E-GT, E-GR, and E-FCI implementations, 2015 ASUG recognition, detailed support from four client-side professionals, a structured Business Plan, and more than R$1 million in corroborated company investment assets.

Balancing of Benefits to the United States: As founder and General and Operations Manager, Mr. de Souza will create and direct a multi-client enterprise rather than fill a fixed position for a single employer. The plan anticipates eleven U.S. positions in addition to Mr. de Souza by Year 5, knowledge transfer, reusable systems, and services for supply-chain-intensive organizations. Labor certification would not adequately capture his founder-controlled capital, proven products, customer history, specialized architecture, and responsibility for creating the enterprise and its jobs. On balance, the waiver better serves the United States.

Considering the record as a whole, Mr. de Souza qualifies for EB-2 classification and satisfies the requirements for a National Interest Waiver. We respectfully request favorable review and approval of his petition and supporting documentation.

Thank you for your attention to this matter.
Sincerely,



Otavio Haverroth Silva
California Bar No. 343486

+1 510 714 0100 +1 619 960 8262 PO BOX 90487 / ZIP CODE 92169

July 19, 2026

USCIS Dallas Lockbox

U.S. Postal Service (USPS):

USCIS

Attn: I-140 P.O. Box 660128

Dallas, TX 75266-0128

Ref.: I-140 Immigrant Visa Self-Petition of Mr. Luciano Aparecido de Souza – Request for National Interest Waiver under the EB-2 Classification

BUSINESS ADMINISTRATION AND LOGISTICS / Bachelor of Business Administration and

Dear Immigration Officer:

Our firm represents Luciano Aparecido de Souza (the "Self-Petitioner" or "Mr. de Souza") in this Form I-140 self-petition. Mr. de Souza respectfully seeks classification under section 203(b)(2) of the Immigration and Nationality Act ("INA") as a member of the professions holding the equivalent of an advanced degree in the United States and, in the alternative, as an individual of exceptional ability in business. He also requests a waiver of the job-offer and permanent-labor-certification requirements because his proposed endeavor satisfies each element of the framework established in *Matter of Dhanasar*, 26 I&N Dec. 884 (AAO 2016).

Mr. de Souza proposes to establish and lead E-IT Technologies in Austin, Texas, as a specialized enterprise-systems company. The company will design, deploy, and scale SAP-integrated solutions and related consulting frameworks for logistics, procurement, goods receipt, electronic invoicing, regulatory controls, cross-border trade documentation, and enterprise-system interoperability. Its initial customers will be medium-sized and large organizations with complex supply chains and high transaction volumes, including manufacturers and businesses in energy, chemicals, pharmaceuticals, agribusiness, retail, distribution, industrial services, and international trade. The endeavor will begin in Texas and is expressly designed for multi-client delivery and expansion across the United States. (Exhibit C.I.)

This is not a generalized proposal to work as an information-technology consultant, nor is it a request based only on the importance of the SAP[1] ecosystem. The endeavor is a defined program of work: (1) adapt and commercialize reusable architectures derived from Mr. de Souza's proven E-GT, E-GR, and related enterprise solutions for United States requirements; (2) integrate logistics, procurement, financial, invoicing, and trade workflows with SAP environments; (3) replace fragmented manual processes with auditable data flows and interoperable system controls; (4) deliver these capabilities to multiple supply-chain-intensive enterprises; and (5) build a United States team that can implement, support, and further develop the solutions. The five-year plan projects growth from three total positions in Year 1, including Mr. de Souza, to twelve total positions in Year 5, or eleven positions

[1] "SAP" refers to enterprise resource planning (ERP) software developed by SAP SE that integrates core business functions, including finance, procurement, logistics, inventory, invoicing, and supply-chain operations. The "SAP ecosystem" includes these platforms and their related technologies, integrations, and implementation services.

in addition to the founder, while moving from project-based services toward repeatable and subscription-based offerings. (Exhibit C.I.)

The record supports the request through evidence that is mutually corroborating rather than merely predictive. Mr. de Souza earned the foreign equivalent of a United States Bachelor of Business Administration plus over five years of progressive, post-baccalaureate experience at the intersection of enterprise management, logistics, foreign trade, and SAP systems. He holds an SAP Solution Consultant certification in SCM–Procurement with SAP ECC 6.0, completed specialized SAP logistics and warehouse-management training, and is professionally registered as an Administrator in São Paulo. (Exhibits B and C.II.)

His record is also entrepreneurial and measurable. Mr. de Souza co-founded E-IT Technologies in Brazil in 2010 and has led its technical and business operations for more than fifteen years. Current corporate records identify him as the company's administrator and 85-percent equity owner. The company's stated business activities include information-technology consulting and the development and licensing of customizable and non-customizable software. Accountant-certified records report aggregate gross revenue of R$118,369,830.57 for E-IT Technologies from 2014 through 2025. A related enterprise, E-IT Services, established in 2018, generated aggregate gross revenue of R$4,403,206.14 through 2025. (Exhibit B.) These figures are presented as evidence of sustained execution and market adoption in Brazil, not as a guarantee that the United States venture will reproduce identical results.

Independent clients and senior industry professionals corroborate that record. Glenn Gunter describes implementations of E-GT in 2012, a system upgrade in 2013, and E-GR inbound automation in 2015 for a manufacturing facility in Sorocaba, Brazil. Leo Anderson of Eastman Chemical Company describes more than a decade of work with Mr. de Souza on SAP logistics, foreign-trade, and electronic-goods-receipt systems, including E-GT, E-GR, and E-FCI. Michael Powell recounts Mr. de Souza's work on high-stakes SAP deployments and statutory tax, fiscal-reporting, and electronic-invoicing integrations at Corning. Alvaro Marzullo describes approximately seven years of collaboration on SAP ECC6, import-process automation, bonded-warehouse studies, and customs-process optimization. (Exhibit C.II.) Contemporaneous trade-press evidence further shows that a Beauty'in enterprise-recovery project developed with E-IT Technologies earned second place in the 2015 ASUG Brazil Impact Awards, with reported benefits that included a stabilized SAP ECC 6.0 environment, inventory and stock adjustments, revised logistics processes, user training, automated integration with a logistics operator, and improved pricing and budget controls. (Exhibit C.II.)

The petition therefore rests on four connected propositions:

1. **EB-2 threshold eligibility.** Mr. de Souza's United States-equivalent bachelor's degree, extensive progressive post-degree experience, and professional work in enterprise systems, logistics, and management establish the equivalent of an advanced degree under 8 C.F.R. § 204.5(k)(2). Independently, his education, occupational certifications and registration, contemporaneous recognition, sustained leadership, and documented contributions establish exceptional ability in business under 8 C.F.R. § 204.5(k)(3)(ii) when considered in the aggregate.
2. **Substantial merit and national importance.** The specific endeavor will apply interoperable enterprise technology to logistics, procurement, invoicing, trade, and manufacturing workflows. Federal sources identify interoperability, integrated data exchange, advanced-manufacturing competitiveness, supply-chain visibility, and electronic invoicing as consequential operational priorities. The endeavor's prospective impact is broader than any one customer because its deliverables are designed to be repeatable across customers, sectors, and states, and because the United States operation will train and employ domestic professionals.
3. **Mr. de Souza is well positioned.** His academic preparation, specialized SAP credentials, fifteen-plus years of entrepreneurial leadership, established products, independently described

multinational projects, substantial historic business revenue, detailed United States plan, and documented access to more than R$1 million in corporate investment assets together show a credible bridge from past performance to future execution. (Exhibits B, C.I, and C.II.)

4. **The balance favors a waiver.** The endeavor is entrepreneurial and multi-client. A labor certification for one fixed position would not capture Mr. de Souza's founder-level General and Operations Manager role, capital allocation, product direction, and responsibility for creating the platform and its additional jobs. Waiver will not displace United States workers; the plan is to hire and train them. The United States will benefit even if other qualified workers are available because he combines proven implementation methods, capital, commercial execution, and venture-creation responsibility.

1. LEGAL STANDARD

1.1 Preponderance of the Evidence

The Self-Petitioner bears the burden of establishing eligibility. The applicable standard is preponderance of the evidence: the record must show that each material proposition is "more likely than not" or "probably true." *Matter of Chawathe*, 25 I&N Dec. 369, 375–76 (AAO 2010). The inquiry does not turn on the number of exhibits. USCIS must assess each item for relevance, probative value, and credibility, both individually and within the context of the record as a whole. Under that standard, even if some doubt remains, the burden is satisfied when the evidence leads to the conclusion that the claim is probably true.

This petition is organized accordingly. Academic records and an independent credential evaluation establish the nature and United States equivalency of Mr. de Souza's education. Government corporate records identify the existence, business purposes, ownership, capitalization, and management of his companies. Accountant-certified revenue schedules and tax materials document sustained commercial activity. A bank investment statement and accountant declaration corroborate available capital. Contemporaneous certificates establish specialized training and certification. Trade-press recognition and detailed letters from client-side executives corroborate the nature, duration, and operational effects of his work. The business plan then translates that established record into a specific United States endeavor. No single item is asked to carry the petition; the evidence is probative because the different sources reinforce the same chronology and capabilities.

1.2 Statutory and Regulatory Framework

INA § 203(b)(2)(A) allocates immigrant visas to qualified individuals who are members of the professions holding advanced degrees or their equivalent, and to individuals of exceptional ability in the sciences, arts, or business whose prospective services will substantially benefit the national economy, cultural or educational interests, or welfare of the United States. INA § 203(b)(2)(B)(i) authorizes waiver of the job-offer requirement when the waiver is in the national interest. See 8 U.S.C. § 1153(b)(2).

The implementing regulation defines an "advanced degree" as a United States academic or professional degree, or a foreign equivalent degree, above the baccalaureate level. It further provides that a United States baccalaureate degree or foreign equivalent degree followed by at least five years of progressive experience in the specialty "shall be considered the equivalent of a master's degree." 8 C.F.R. § 204.5(k)(2). Initial evidence may include an official academic record showing the baccalaureate degree or foreign equivalent together with evidence of at least five years of progressive post-baccalaureate experience in the specialty. 8 C.F.R. § 204.5(k)(3)(i)(B). See 8 C.F.R. § 204.5.

The same regulation defines exceptional ability as "a degree of expertise significantly above that ordinarily encountered" in the sciences, arts, or business. 8 C.F.R. § 204.5(k)(2). A petitioner ordinarily supplies evidence satisfying at least three of six regulatory categories, followed by a final-merits review of the record in its totality. 8 C.F.R. § 204.5(k)(3)(ii). The categories include a related academic credential; letters establishing at least ten years of full-time experience; a professional license or occupational certification; remuneration indicative of exceptional ability; membership in professional associations; and recognition for achievements and significant contributions by peers, governmental entities, or professional or business organizations. Comparable evidence may be submitted where a criterion does not readily apply. 8 C.F.R. § 204.5(k)(3)(iii).

1.3 The *Dhanasar* Framework

After EB-2 eligibility is established, *Matter of Dhanasar* asks whether the record proves, by a preponderance of the evidence, that:

1. the proposed endeavor has both substantial merit and national importance;
2. the petitioner is well positioned to advance the proposed endeavor; and
3. on balance, it would be beneficial to the United States to waive the requirements of a job offer and permanent labor certification.

The first prong focuses on the proposed endeavor rather than the general importance of an occupation or industry. Substantial merit may arise in business, entrepreneurship, technology, or other fields and need not be reduced to immediate economic gain. National importance depends on the endeavor's prospective impact, including broader implications for a field or industry, significant potential to employ United States workers, or other substantial positive economic effects. Geographic breadth is relevant but not dispositive; the nature and prospective reach of the work control.

The second prong focuses on the individual. Relevant considerations include education, skills, knowledge, and a record of success in related efforts; a detailed plan for future activities; progress toward the endeavor; and interest from potential customers, users, investors, or other relevant persons. *Id.* at 890. USCIS does not require proof that a venture is more likely than not to succeed ultimately. Rather, the question is whether the individual is well positioned to advance it. A business plan may explain the endeavor, but USCIS appropriately looks for independent evidence that corroborates the plan's central assumptions.

The third prong balances the benefits of the proposed endeavor and the individual's positioning against the interests ordinarily served by labor certification. Considerations include whether the nature of the endeavor makes a job offer or labor certification impractical; whether the United States would benefit from the individual's contributions even if other qualified workers are available; whether the endeavor presents sufficiently important or time-sensitive benefits; whether labor certification would fail to capture knowledge or skills exceeding a position's minimum requirements; and whether the endeavor may produce meaningful economic impact or jobs. A labor shortage alone does not establish this prong.

USCIS's current Policy Manual expressly recognizes the distinctive evidence presented by entrepreneurs. Ownership and an active central role, successful leadership of prior ventures, relevant degrees and certifications, investment, revenue growth, prior products, third-party review, and detailed letters may all be probative. At the same time, broad claims about entrepreneurship, job creation, or industry importance are insufficient. Strong petitions connect a documented record of success to a specific plan, show concrete preparatory steps, and support forecasts with independent evidence. See USCIS Policy Manual, Vol. 6, Pt. F, Ch. 5. This petition follows that approach.

2. THE EB-2 CLASSIFICATION

2.1 Mr. de Souza's Proposed Professional Role

Mr. de Souza's proposed role is **General and Operations Manager**, SOC 11-1021. He will serve as the founder-level executive responsible for United States market strategy, client engagement, product direction, integration standards, project delivery, financial and staffing decisions, and supervision of the company's service lines. During the launch phase, the same role necessarily includes principal responsibility for SAP solution architecture because he developed and directed the underlying methods and must establish the technical and delivery standards that the United States team will follow. (Exhibit C.I.) "Principal SAP Solution Architect" thus describes a specialized function performed within his General and Operations Manager role; it is not a competing proposed occupation.

The Department of Labor's Occupational Outlook Handbook directly confirms the character and preparation level of that occupation. BLS identifies General and Operations Managers within the "Top Executives" profile and explains that they direct day-to-day operations, formulate policies, plan the use of materials and human resources, assign work, and ensure completion of projects. BLS reports that a bachelor's degree is the typical entry-level education for top executives and that five years or more of related occupational experience is typical. It also explains that managerial experience is expected to be in the organization's area of specialty. BLS, Top Executives — General and Operations Managers. O*NET likewise places General and Operations Managers in Job Zone Four, "Considerable Preparation Needed," and identifies a four-year bachelor's degree and several years of related experience as typical preparation. O*NET, General and Operations Managers, SOC 11-1021.00.

Those sources match the position described in the business plan. Mr. de Souza will direct the provision of specialized SAP-centered products and services, allocate operating resources, manage budgets and customer delivery, coordinate sales and technical functions, establish procedures, hire and supervise personnel, and measure performance. (Exhibit C.I.) The work is managerial, but not generic: competent direction of this enterprise requires integrated knowledge of business administration, logistics, enterprise architecture, SAP procurement and materials management, foreign-trade workflows, electronic invoicing, data integration, and project leadership. The related Department of Labor profiles for management analysts, computer systems analysts, and logisticians further confirm that the underlying advisory, systems, and supply-chain functions ordinarily require baccalaureate-level preparation. BLS, Management Analysts; BLS, Computer Systems Analysts; BLS, Logisticians. Mr. de Souza's business degree, graduate logistics study, technical certifications, and progressive experience are academically and functionally tied to that professional work.

2.2 Mr. de Souza Holds the Equivalent of an Advanced Degree

2.2.1 United States-Equivalent Bachelor's Degree and Graduate Study

Mr. de Souza earned a *Título de Bacharel em Administração* from Universidade Metodista de São Paulo in March 2003. His academic records reflect a four-year program including Foreign Trade Systems, Financial and Budgetary Administration, Informatics, International Economics, Customs and Tax Legislation, Information Systems Management, Production Management, and Materials and Assets Management. (Exhibit B.)

He thereafter completed Fundação Getulio Vargas's graduate program in Business Logistics in September 2004. The program included Global Logistics, Supplier Development and Material Acquisition, Planning and Control of Production and Inventory, Service Management, Logistics Costs, Business Negotiation, and Investment Project Analysis. (Exhibit B.)

Academic Equivalency in the United States

BACHELOR OF BUSINESS ADMINISTRATION

ONE YEAR OF GRADUATE STUDY IN LOGISTICS

Carnegie Evaluations LLC, offers this evaluation, after reviewing copies of the original diploma certificates and transcripts provided. This evaluation is advisory in nature and is based on the assumption that the submitted documents are accurate. There are no apparent grounds to disbelieve the authenticity and accuracy of the documentation presented on behalf of Mr. Luciano Aparecido de Souza. In addition, this evaluation is based upon standard scholarly and professional sources as referenced at the end of this document. Carnegie Evaluations LLC, is not responsible for how this evaluation report will be used and is not responsible for damages resulting from such use of this report.

Carnegie Evaluations LLC reviewed the underlying diplomas, certificates, and transcripts. Its November 24, 2025 report concludes that the Brazilian education is equivalent to a **Bachelor of Business Administration and one year of graduate study in Logistics** from accredited United States institutions. (Exhibit B.) The petition relies on the evaluation exactly as written. It does not characterize the FGV credential, standing alone, as the foreign equivalent of a United States master's degree.

2.2.2 More Than Five Years of Progressive Post-Baccalaureate Experience

The advanced-degree equivalency instead follows the alternative expressly set out in 8 C.F.R. § 204.5(k)(2): a foreign-equivalent baccalaureate degree followed by at least five years of progressive experience in the specialty. The chronology demonstrates far more than the required period.

This experience is not supported by a résumé or ownership claim alone. Government corporate records establish that E-IT Technologies commenced operations on July 13, 2010, identify its closely related information-technology consulting and software activities, and identify Mr. de Souza as administrator and 85-percent owner. The company's accountant independently confirms that he is an equity partner and executive manager with control and decision-making authority. Accountant-certified revenue schedules and tax records demonstrate that the enterprises were economically active over many years. Most importantly, four client-side professionals describe, from first-hand knowledge, the systems he designed or directed, the operational settings, the successive projects, and the growing scope of his responsibilities from 2012 forward. Contemporaneous SAP certificates and professional coverage of the 2015 ASUG-recognized project provide additional dated anchors. (Exhibits B and C.II.) Read together under the preponderance standard, these independent sources establish both the duration and the substance of his post-baccalaureate experience.

- **2002–2004 — Foundation in foreign trade and logistics.** While completing his business degree and before finishing the FGV graduate program, Mr. de Souza completed specialized courses in foreign-exchange and international banking operations in foreign trade, international transportation and cargo unitization, competitive strategy, production and inventory planning, logistics costs, and global logistics. These studies supplied the commercial and supply-chain foundation later applied to SAP systems. (Exhibits B and C.II.)
- **2006 — Specialized SAP logistics execution and warehouse management.** He completed SAP courses SCM601, Processes in Logistics Execution; SCM610, Delivery Processes; SCM630, Warehouse Management; and SCM631, Additional Topics in Warehouse Management. The sequence progressed from logistics execution and delivery processes into increasingly specialized warehouse-management functionality. (Exhibit C.II.)

- **2007 — SAP professional certification.** SAP certified him as a Solution Consultant, SCM–Procurement with mySAP ERP 2005, using SAP Enterprise Central Component 6.0. The certificate bears identification number 0004453601 and a certification date of August 4, 2007. (Exhibit C.II.)



We hereby confirm that

Luciano Aparecido Souza

is certified as

Solution Consultant
SCM - Procurement with mySAP ERP 2005

Softwarecomponents: SAP Enterprise Central Component (ECC) 6.0

- **2010 — Entrepreneurial and managerial progression.** Mr. de Souza co-founded E-IT Technologies, which commenced operations on July 13, 2010. Corporate records describe the company's activities as information-technology project consulting and management and the development and licensing of customizable and non-customizable software. He progressed beyond consultant-level implementation into ownership, product direction, technical leadership, client management, and enterprise administration. Current records identify him as administrator and 85-percent owner. (Exhibit B.)
- **2012–2015 — Repeated implementations in manufacturing.** Glenn Gunter states that Mr. de Souza supported the implementation of E-GT for a manufacturing facility in Sorocaba in 2012, a business-system upgrade in 2013, and E-GR inbound automation in 2015. Mr. Gunter identifies operational efficiency, cost control, process reliability, innovation, critical-deadline management, and effective collaboration with information-technology and business users. (Exhibit C.II.) This reflects progressive responsibility across multiple systems and successive client needs rather than repetition of a single task.
- **2015 — Recognized enterprise recovery and integration.** ASUG Brazil's 2015 Impact Awards placed the Beauty'in "Recovering Business Control" project, developed with E-IT Technologies, second among the recognized cases. The contemporaneous article describes stabilization of SAP ECC 6.0; updates to development, testing, and production environments; inventory and stock adjustments; logistics-process revisions; user training; automated integration with a logistics operator; and new pricing and budget controls. (Exhibit C.II.) These are cross-functional responsibilities requiring the integration of business, logistics, governance, and technical judgment.
- **2012–2026 — Long-term client trust and multinational complexity.** Leo Anderson describes more than a decade of work involving foreign-trade, raw-material, resale-goods, goods-receipt, tax-compliance, and multi-continent operations. Alvaro Marzullo describes approximately seven years of collaboration on Corning's SAP ECC6 operations, import automation, bonded-warehouse studies, and customs optimization. Michael Powell describes high-stakes SAP deployments and the translation of complex statutory tax and electronic-reporting requirements into stable global architecture. (Exhibit C.II.)
- **2014–2025 — Sustained business leadership at scale.** Accountant-certified revenue schedules document R$118,369,830.57 in aggregate gross revenue for E-IT Technologies over twelve years, including annual revenue above R$10 million in five of the six years from 2020 through 2025. E-

IT Services, established in 2018, generated R$4,403,206.14 through 2025. (Exhibit B.) Sustaining operations, client delivery, staffing, financial management, and product development across that period evidences progression well beyond the five-year threshold.

This evidence shows an unbroken post-baccalaureate trajectory from specialized practitioner, to certified SAP consultant, to solution and product architect, and ultimately to founder-level General and Operations Manager, majority owner, and administrator of enterprises delivering complex systems to multinational clients. The progression is qualitative as well as chronological: his duties expanded from executing specialized logistics functions, to designing integrated solutions, to directing products and multi-stakeholder implementations, and then to managing the companies, capital, personnel, customers, and delivery model through which that work was commercialized. It is directly related to the specialty in which he will work in the United States. The evidence therefore establishes substantially more than five years of progressive post-baccalaureate experience and, with his foreign-equivalent bachelor's degree, the equivalent of an advanced degree under 8 C.F.R. § 204.5(k)(2).

2.3 In the Alternative, Mr. de Souza Qualifies as an Individual of Exceptional Ability in Business

Although the advanced-degree evidence independently establishes threshold eligibility, the record also satisfies the alternative exceptional-ability classification. At least three regulatory categories are met, and the evidence in its totality demonstrates expertise significantly above that ordinarily encountered in enterprise-systems and business-process consulting.

2.3.1 Related Academic Credentials — 8 C.F.R. § 204.5(k)(3)(ii)(A)

Mr. de Souza holds the foreign equivalent of a United States Bachelor of Business Administration and completed one year of graduate study in Logistics. The curricula are directly related to the endeavor: foreign trade, customs and tax legislation, information-systems management, production, materials, inventory planning, logistics costs, supplier development, and investment analysis. (Exhibit B.) The credentials therefore satisfy the academic-record criterion and, more importantly for final merits, supplied the business and logistics knowledge that differentiates his technical work from routine software configuration.

2.3.2 Occupational Certification and Professional Registration — 8 C.F.R. § 204.5(k)(3)(ii)(C)

SAP certified Mr. de Souza as a Solution Consultant in SCM–Procurement with SAP ECC 6.0 in 2007. He also holds current professional registration as an Administrator with the Regional Council of Administration of São Paulo, registration number 158485, first registered October 9, 2025. (Exhibit C.II.) The SAP credential confirms tested specialization in the enterprise platform central to the endeavor; the administrator registration confirms professional standing in the managerial field in which he will lead the United States entity.

2.3.3 Recognition for Achievements and Significant Contributions — 8 C.F.R. § 204.5(k)(3)(ii)(F)

The recognition evidence is both contemporaneous and third-party. ASUG Brazil's professional publication reported that the Beauty'in project developed with E-IT Technologies won second place in the 2015 Impact Awards. The award criteria identified by the publication included best practices, service-level improvements, originality, and innovation. The accompanying case description attributes concrete improvements to the project: stabilizing the SAP environment, separating and updating system environments, correcting inventory and stock processes, revising logistics, training users, automating

integration with the logistics operator, and improving pricing and budget controls. Corporate records establish Mr. de Souza's founder-level leadership of the company that developed the project, while the client letters independently identify him as the person directing the same class of SAP, logistics, integration, and enterprise-control work. (Exhibits B and C.II.) The award is therefore not presented in isolation or attributed to him merely because of ownership; it is considered with evidence connecting his documented role to the recognized work.



The client letters provide further recognition by professionals with first-hand knowledge. Glenn Gunter calls Mr. de Souza a trusted partner after successive implementations. Leo Anderson describes systemic and scalable contributions across enterprise and trade operations. Michael Powell describes an unusual capacity to translate dense regulatory requirements into stable system architecture. Alvaro Marzullo emphasizes his ability to direct complex projects involving multiple stakeholders, strict regulation, and mission-critical operations. (Exhibit C.II.) These statements are probative because they identify specific systems, dates, operational settings, and results; they are not generic endorsements.

2.3.4 Additional Objective Evidence of Sustained Professional Practice

The petition has already satisfied three regulatory categories through the related academic record, occupational certification and professional registration, and recognition evidence. The experience record supplies substantial additional weight at final merits. E-IT Technologies began operations in 2010; government corporate records identify Mr. de Souza as administrator and majority owner; the accountant confirms his executive control and decision-making authority; certified schedules document annual business revenue beginning in 2014; tax records corroborate the active economic relationship; and client letters describe his work on successive engagements from 2012 forward. (Exhibits B and C.II.) For a founder whose clients directly observed the substantive work, these mutually consistent records provide unusually objective evidence of sustained professional practice and leadership over more than a decade.

2.3.5 Final Merits

The final-merits question is not whether Mr. de Souza collected a minimum number of credentials. It is whether the aggregate evidence demonstrates expertise significantly above that ordinarily encountered in the field. It does.

First, his expertise spans three domains that enterprise transformations often separate: the business and regulatory process, the logistics and trade workflow, and the SAP architecture used to implement it. Second, he has converted that integrated knowledge into reusable products—E-GT for foreign-trade processes, E-GR for electronic-invoice validation and goods receipt, and E-FCI for fiscal calculation

and reporting—rather than limiting his work to hourly configuration. Third, multinational client representatives independently describe long-term reliance on those systems in manufacturing and cross-border operations. Fourth, the ASUG evidence documents recognition of a project on best-practice, service, originality, and innovation criteria. Fifth, the revenue record shows that the work supported a durable enterprise with sustained commercial adoption, not an isolated project.

Taken together, the related degree, graduate logistics study, SAP certification, professional registration, contemporaneous award recognition, documented products, majority ownership and leadership, sustained revenue, and detailed client testimony establish exceptional ability in business and enterprise systems. Mr. de Souza therefore qualifies for EB-2 classification on this alternative basis as well.

3. NATIONAL INTEREST WAIVER

3.1 The Proposed Endeavor

Because the first *Dhanasar* prong evaluates the specific endeavor rather than a broad occupation, the proposed work should be stated with precision. Serving as General and Operations Manager, Mr. de Souza will establish and direct an Austin-based enterprise that provides specialized SAP-centered system integration, process automation, and reusable software extensions to United States organizations with complex logistics, procurement, invoicing, and trade workflows. The company will combine five service and product lines:

1. **SAP consulting and process optimization.** Mr. de Souza and the United States team will assess and redesign procurement, materials-management, inventory, warehouse, goods-receipt, logistics, and finance-integration workflows in SAP environments.
2. **ERP integration and automation.** E-IT Technologies will connect SAP environments with financial, banking, logistics, vendor, electronic-document, and other enterprise platforms, reducing manual re-entry and improving the continuity and auditability of transactional data.
3. **Electronic invoicing and compliance-oriented solutions.** The company will automate invoice ingestion, validation, exception handling, and approval workflows and configure controls to fit applicable United States customer requirements. It will draw on the architecture and implementation experience developed through E-GR, while adapting the solution rather than transplanting Brazil-specific legal rules.
4. **Trade and supply-chain extensions.** The company will adapt concepts proven in E-GT—structured import and export workflows, documentation, cost settlement, customs-related information, and integration with core ERP data—to the operational and regulatory requirements of United States customers engaged in cross-border commerce.
5. **Custom extensions and scalable offerings.** The company will initially earn revenue from consulting and project implementation while developing modular extensions, integration accelerators, and subscription services that can be deployed across multiple customers without replacing their core ERP environments. (Exhibit C.I.)

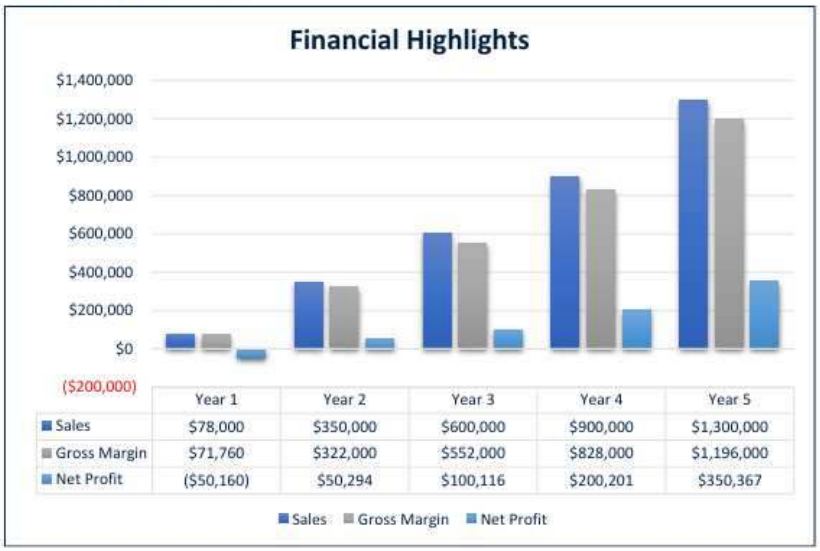
The General and Operations Manager role is the mechanism through which Mr. de Souza will execute this endeavor. He will define business and product strategy, allocate capital and personnel, translate customer processes into system requirements, establish architecture and implementation standards, supervise delivery, train United States personnel, and manage product development. During the launch stage, his responsibilities include the principal solution-architecture function because the United States service model must be built from the methods and systems he previously directed. His

central participation is therefore operational, managerial, and specialized, all within one founder-level role. (Exhibit C.I.)

The company will begin in Austin and pursue customers nationwide. Year 1 uses a lean three-person structure: Mr. de Souza, a business-development manager, and a part-time administrative or operations assistant, supplemented when necessary by project-based technical resources. The plan adds SAP/ERP consultants and a sales and marketing specialist in Year 2; a project manager and technical-support engineer in Year 3; a senior solution architect and human-resources specialist in Year 4; and customer-success and finance/accounting functions in Year 5. Total headcount is projected to reach twelve, including Mr. de Souza. (Exhibit C.I.)

The financial plan estimates an initial investment of $107,000, composed of $95,000 in launch expenses and $12,000 in initial reserves. It forecasts revenue of $78,000 in Year 1, $350,000 in Year 2, $600,000 in Year 3, $900,000 in Year 4, and $1.3 million in Year 5. It anticipates an initial loss while the company enters the market, profitability beginning in Year 2, and cumulative federal and state taxes of approximately $259,266 over five years. (Exhibit C.I.) These are projections, not accomplished facts. Their evidentiary value comes from their specificity and from independent corroboration of Mr. de Souza's prior record, ownership authority, and access to capital.

2.4.1 Financial Highlights Chart



E-IT Technologies' Five-Year Financial Highlights, including projected sales, gross margin, and net profit. (Exhibit C.I.)

3.2 FIRST PRONG: The Proposed Endeavor Has Substantial Merit and National Importance

3.2.1 Substantial Merit

The endeavor has substantial merit in business, technology, advanced manufacturing support, logistics, and workforce development. Its principal value is operational: it will enable organizations to move reliable information among procurement, inventory, warehouse, goods-receipt, financial, invoicing, trade, and external-partner systems. When those functions remain fragmented, organizations depend on manual entry, delayed reconciliations, and disconnected controls. When they are integrated, the same organizations can validate data earlier, manage exceptions, improve traceability, reduce avoidable processing, and make decisions using more complete operational information.

The federal government's own technical work recognizes the importance of integration and interoperability to modern manufacturing. NIST's *Current Standards Landscape for Smart*

Manufacturing Systems explains that standards support product design, production-system operations, and integration into business value chains; the flow of information across manufacturing control levels and among enterprise partners can lower costs and improve reliability and efficiency. It also identifies continuing limits in the interconnection of business and production systems. NISTIR 8107, Smart Manufacturing Standards Landscape. E-IT Technologies' services address that interface in practical deployments: the company will connect the ERP business layer to logistics, suppliers, documents, and operational workflows while preserving reliable controls.

The proposed electronic-invoicing and goods-receipt work likewise has concrete merit. The United States Department of the Treasury's Invoice Processing Platform demonstrates that electronic invoice management can reduce processing costs, manage approvals, support timely payment, and exchange files directly with SAP and other financial systems. Treasury reports that one federal agency using the platform reduced the cost of processing undisputed invoices by 54 percent and disputed invoices by 43 percent. U.S. Treasury, Invoice Processing Platform. Mr. de Souza does not claim that E-IT Technologies will operate Treasury's platform or reproduce those agency results. The official program instead confirms the underlying proposition: integrated electronic-invoice workflows can deliver meaningful efficiency, control, and data-exchange benefits, including in SAP environments.

The substantial merit is also demonstrated by Mr. de Souza's prior implementations. At Apex Tool Group's Brazilian manufacturing operation, Glenn Gunter states that E-GT, the 2013 system upgrade, and E-GR provided capabilities supporting efficiency, cost control, stable processes, manufacturing requirements, and customer demand. (Exhibit C.II.) Leo Anderson states that related work at Solutia and Eastman streamlined import operations, improved compliance, reduced costs, and supported scalable Latin American operations. (Exhibit C.II.) Alvaro Marzullo describes automation of import processes and improved operational efficiency at Corning during an important expansion period. (Exhibit C.II.) The ASUG case documents similar effects in a different customer environment. (Exhibit C.II.) These examples show that the proposed services are capable of producing operational value; they do not merely repeat generalized assertions from the business plan.

The workforce component adds merit without being treated as the sole basis for national importance. The plan will create United States positions in business development, SAP/ERP consulting, project management, technical support, solution architecture, customer success, finance, and administration. Mr. de Souza will transfer knowledge through project supervision and training. That model is consistent with the Department of Labor's description of systems analysts, who design improvements, oversee implementation, and train users, and logisticians, who select and implement systems for procurement and product movement. BLS projects faster-than-average growth from 2024 to 2034 for computer systems analysts, management analysts, and logisticians. These statistics evidence an active and consequential field, not an assertion that an occupational shortage alone satisfies *Dhanasar*. BLS, Computer Systems Analysts; BLS, Management Analysts; BLS, Logisticians.

3.2.2 National Importance Requires Broader Prospective Implications

National importance cannot be established simply by describing SAP as important, identifying large client industries, or projecting profit for E-IT Technologies. USCIS's Policy Manual makes clear that benefits to one employer or its customers alone generally are insufficient. It also gives the example of a software professional whose client-specific work may lack broader implications. The relevant question is therefore whether Mr. de Souza's own endeavor—not the occupation in the abstract—has prospective implications for a field, region, or the public at a level consistent with national importance.

The endeavor meets that standard for five connected reasons: it addresses enterprise integration in nationally consequential production and goods-movement systems; it is designed around repeatable tools and methods rather than a single engagement; it targets multiple industries and customers

nationwide; it will transfer knowledge and create United States implementation capacity; and its economic plan is supported by a record of prior adoption, revenue, and available capital. The argument is not that every ERP project is nationally important. It is that this specific venture is structured to convert a proven body of systems into scalable, multi-client capabilities for supply-chain-intensive United States enterprises. Official sources establish the national significance of the operational problems; the case-specific evidence establishes the endeavor's proposed response, prior validation, and prospective reach. That is the required evidentiary bridge.

3.2.3 The Endeavor Supports the Digital Integration Needed by United States Manufacturing

The 2024 *Strategic Plan for the Manufacturing USA Program*, published by NIST, states that the program connects people, ideas, and technology to solve industry-relevant advanced-manufacturing challenges and enhance industrial competitiveness. Its goals include increasing United States manufacturing competitiveness, transitioning innovative technologies into scalable and cost-effective domestic manufacturing capabilities, accelerating an advanced-manufacturing workforce, and promoting resilient institute networks. It further recognizes that digital technologies are increasingly important to manufacturing and connects advanced manufacturing with economic prosperity, resilience, supply chains, and high-quality employment. NIST, Strategic Plan for the Manufacturing USA Program (2024).

E-IT Technologies will not conduct federally funded manufacturing research, and this petition does not claim governmental sponsorship. The relevance is functional. Manufacturers cannot deploy advanced production technologies effectively if purchasing, inventory, warehouse, invoice, logistics, finance, and external-partner data remain fragmented. E-IT's proposed systems integration and automation operate at that enterprise layer. By designing reusable SAP extensions and implementation frameworks for manufacturers and other supply-chain-intensive organizations, the company will support the transition from disconnected processes to more integrated, reliable, and scalable operations.

The opportunity is economically consequential. The United States Census Bureau reports that United States goods shipments reached 12.2 billion tons and $18.0 trillion in value in 2022; manufacturing establishments alone shipped 4.9 billion tons of commodities worth $7.1 trillion. U.S. Census Bureau, 2022 Commodity Flow Survey Release. These national figures do not prove that E-IT will capture a particular market share. They establish that the logistics, inventory, goods-receipt, and trade workflows the endeavor targets operate within systems of national economic scale. A reusable solution that improves the reliability and integration of those workflows has prospective significance beyond the revenue of the consulting company itself.

3.2.4 The Endeavor Supports Supply-Chain Visibility and Cross-Border Data Modernization

The Automated Commercial Environment ("ACE") is the United States government's system through which the trade community reports imports and exports and the government determines admissibility. CBP describes ACE as the system of record for trade transactions. U.S. Customs and Border Protection, Automated Commercial Environment. CBP's September 2025 modernization issue paper identifies increased supply-chain visibility and accountability and faster government action among the intended advancements of ACE modernization. CBP, ACE Modernization Issue Paper (Sept. 2025).

E-IT Technologies will not replace ACE, make admissibility decisions, or provide governmental customs functions. Its role is on the enterprise side: organizing import and export information, documents, product and cost data, approvals, and ERP transactions so that businesses can maintain more reliable workflows and interface with brokers, carriers, partners, and applicable reporting systems. Mr. de Souza's E-GT experience is directly relevant to that enterprise-side challenge. Leo Anderson

identifies E-GT as an SAP-integrated foreign-trade system used to streamline import and export operations, and Alvaro Marzullo describes Mr. de Souza's work on import automation, bonded-warehouse processes, and customs optimization. (Exhibit C.II.)

The broader implication is therefore not merely faster processing for one customer. The endeavor will adapt a repeatable architecture for organizations operating across suppliers, facilities, ports, carriers, brokers, and jurisdictions. Improvements in the structure, validation, and traceability of enterprise trade data can support visibility and operational continuity across more than one supply chain. Because the company will serve customers nationally and develop modular offerings, the prospective impact extends beyond a single worksite.

3.2.5 Repeatable Products and Multi-Client Delivery Distinguish the Endeavor from Ordinary Consulting

USCIS correctly cautions that a software professional who adapts an employer's code for individual clients may have difficulty proving national importance without evidence of broader effects. This endeavor contains the features that distinguish it from that example: named architectures already used in multiple organizations, a plan to adapt them into repeatable extensions and accelerators, a nationwide multi-client model, and a United States delivery team that will extend implementation capacity beyond Mr. de Souza's personal labor.

First, Mr. de Souza has already led the development and implementation of named, reusable solutions. E-GT structures foreign-trade workflows within SAP. E-GR validates and processes electronic-invoice XML data for goods receipt. E-FCI performs specialized fiscal calculations and reporting. (Exhibits C.I and C.II.) The United States plan does not assume that Brazil-specific rules automatically apply here. Instead, it will adapt the underlying architecture—document ingestion, validation rules, exception management, workflow integration, and ERP posting—to customer and jurisdiction requirements in the United States.

Second, the business model deliberately progresses from founder-led consulting to modular extensions and subscription services. Revenue is divided among SAP process optimization, ERP integration, electronic invoicing and compliance, custom extensions, and SaaS or subscription offerings. By Year 5, the plan projects material revenue from each line rather than dependence on a single customer or one type of engagement. (Exhibit C.I.) This structure supports dissemination across customers.

Third, the record shows prior cross-customer transferability. The letters describe implementations in tool manufacturing, chemicals, materials, and other multinational environments. The ASUG evidence documents a separate consumer-products enterprise-recovery project. (Exhibit C.II.) Although each implementation was adapted to its customer, the same core competencies—SAP integration, logistics, goods receipt, invoicing, trade, and business controls—produced value across industries. That record makes the planned multi-sector United States model credible.

Fourth, the endeavor includes workforce multiplication. By developing implementation standards and training United States consultants, project managers, support engineers, and architects, Mr. de Souza will extend the delivery capability beyond his own billable hours. The plan's Year 5 structure includes two SAP/ERP consultants, a senior solution architect, a project manager, and a technical-support engineer in addition to business and administrative roles. (Exhibit C.I.) This feature is directly relevant to prospective impact: a team can deploy and support the framework across multiple enterprises and states.

3.2.6 Austin Is a Logical Launch Point for a Nationally Oriented Endeavor

Austin is the initial operating base, not the limit of the endeavor's reach. The Texas Governor's Economic Development and Tourism Office describes Texas as a leading advanced-manufacturing and export state and identifies target clusters including aerospace and defense, automotive, computers and semiconductors, and production technology and heavy machinery. It also emphasizes the state's central location, infrastructure, workforce, and access to domestic and international markets. Office of the Texas Governor, Advanced Manufacturing. These sectors are potential users of the logistics, enterprise-integration, inventory, procurement, and trade capabilities at the center of E-IT's plan.

The business plan provides for nationwide customer acquisition, remote and on-site delivery, strategic partnerships, recurring services, and expansion after the Austin launch. (Exhibit C.I.) The petition does not rely on an unconfirmed claim that a future office will be placed in a distressed census tract. Nor does it claim that a local Austin consulting business is nationally important merely because Texas has a large economy. Austin matters because it provides access to relevant industries and talent from which a deliberately national, multi-client delivery model can be launched.

3.2.7 Job Creation and Fiscal Effects Reinforce, but Do Not Substitute for, Broader Impact

The business plan projects growth from three total workers in Year 1 to twelve in Year 5. Because Mr. de Souza is included in those totals, the plan represents eleven positions in addition to the founder by Year 5, not twelve newly created positions. Payroll is projected to increase from $93,000 to $668,000 annually, and cumulative federal and state taxes are projected at approximately $259,266 over five years. (Exhibit C.I.)

These projections are relevant but not dispositive. Eleven additional jobs alone would not necessarily establish national importance in a large regional economy. Their significance is that they implement and scale the endeavor: consultants and architects expand delivery; project and support personnel sustain deployments; customer-success and business-development personnel extend customer adoption; and finance, human-resources, and administrative personnel support a durable United States operation. The positions are mechanisms through which a founder-led practice becomes a multi-client enterprise capable of broader impact.

The projections also have a credible financial foundation. An accountant who has served the Brazilian enterprise since January 2021 states that Mr. de Souza is an equity partner and executive manager with authority to allocate resources and identifies R$1,000,000 in financial availability. A May 11, 2026 business investment statement reports a net balance of R$1,005,018.89 across investment funds and certificates of deposit. (Exhibit C.II.) That amount exceeds the plan's stated initial capital requirement when viewed as evidence of available Brazilian-currency resources, subject to transfer, exchange, formation, tax, and other implementation requirements. It corroborates capacity; it does not eliminate normal startup risk.

3.2.8 First-Prong Conclusion

The endeavor's substantial merit is demonstrated by its capacity to improve process reliability, data integration, invoice and goods-receipt automation, logistics visibility, and enterprise controls. Its national importance arises from the specific design and prospective reach of the venture: reusable solutions; multi-client and multi-sector deployment; nationwide expansion; relevance to the digital integration of manufacturing and goods movement; enterprise-side support for cross-border data workflows; and training and employment of United States professionals who will multiply delivery capacity.

Official sources confirm that advanced-manufacturing competitiveness, interoperable information flows, supply-chain visibility, electronic invoicing, and systems-oriented logistics are consequential

United States concerns. The independent evidence shows that Mr. de Souza has previously delivered the same class of solutions across customers and industries. The business plan connects that record to a defined United States implementation model. Considered together, the evidence establishes both substantial merit and national importance under the first prong of *Dhanasar*.

3.3 SECOND PRONG: Mr. de Souza Is Well Positioned to Advance the Proposed Endeavor

The second prong does not require certainty that the venture will reach every forecast. *Dhanasar* identifies a non-exhaustive set of considerations—education, knowledge, skills, a record of success, a model or plan, progress, and interest or support—and expressly recognizes that entrepreneurial ventures may ultimately fall short despite intelligent planning and competent execution. Neither *Dhanasar* nor the Policy Manual makes an already-operating United States entity, a completed United States sale, or a United States customer contract a mandatory prerequisite. The question is whether the total record shows that Mr. de Souza is well positioned to advance the endeavor. It does. The proposed work is not a departure from his career; it is the next geographic and commercial stage of the same integrated enterprise-systems work he has already led for more than fifteen years.

3.3.1 His Education Connects Business, Foreign Trade, Logistics, and Information Systems

Mr. de Souza's Bachelor of Business Administration is substantively related to the endeavor. The coursework includes Foreign Trade Systems, Informatics, International Economics, Customs and Tax Legislation, Production Management, Information Systems Management, and Materials and Assets Management. His subsequent FGV graduate study adds Global Logistics, Supplier Development and Material Acquisition, Production and Inventory Planning, Logistics Costs, Service Management, and Investment Project Analysis. (Exhibit B.)

That combination is important because enterprise integration is not purely a programming exercise. A solution architect working on purchasing, inventory, imports, invoices, and financial posting must understand the transactions the software represents. The degree and graduate study enable Mr. de Souza to identify the business objective, understand the logistics and control requirements, and translate them into system design. The independent credential evaluation confirms both the United States-equivalent bachelor's degree and the additional year of graduate-level logistics study. (Exhibit B.)

3.3.2 His Technical Training Is Specific to the Endeavor's Core Workflows

Mr. de Souza then developed specialized SAP expertise tied to the same functional areas. In 2006 he completed SAP training in logistics execution, delivery processes, warehouse management, and advanced warehouse-management topics. In 2007 SAP certified him as a Solution Consultant in SCM–Procurement with SAP ECC 6.0. (Exhibit C.II.) Earlier foreign-trade courses covered international banking and currency operations and international transportation and cargo unitization. (Exhibit C.II.)

The sequence matters. His credentials are not an assortment of unrelated short courses. They trace the architecture of the proposed solutions: procurement creates obligations; transportation moves goods; delivery and warehouse functions manage physical receipt; invoice and financial integrations validate and record the transaction; trade and customs processes govern cross-border movement; and ERP integration connects the steps. That is the same end-to-end perspective described by the client witnesses.

His current professional registration as an Administrator with CRA-SP further corroborates formal standing in business administration. (Exhibit C.II.) Although the registration is recent and does not by itself prove the earlier experience, it complements the longstanding academic, corporate, revenue, and client evidence.

3.3.3 He Has a Documented Record of Building and Leading a Related Enterprise

E-IT Technologies began operations on July 13, 2010—approximately seven years after Mr. de Souza received his business degree. Its corporate purpose includes information-technology project consulting, operational assistance and management, and the development and licensing of software. Current records show a fully subscribed capital of R$550,000, identify Mr. de Souza as the administrator with general management authority, and allocate 85 percent of the equity to him. (Exhibit B.)

"E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA"
CNPJ 12.349.468/0001-75
NIRE 35224511288

This evidence is highly probative under the entrepreneur guidance in the USCIS Policy Manual. It establishes more than passive ownership. Mr. de Souza has authority to represent and manage the company, and the company's legal activities closely match the proposed United States services. The enterprise has operated for more than fifteen years, so he has already confronted the functions that a new consulting and software company must manage: technical delivery, product direction, customer acquisition and retention, staffing and subcontracting, financial control, and adaptation to new client requirements.

The record of E-IT Services adds corroboration. Brazilian registration evidence shows that the related company opened September 3, 2018, with activities including information-technology consulting and customizable and non-customizable software development and licensing. (Exhibit B.) Operating related entities over time supports Mr. de Souza's claim that he can structure and supervise more than a single individual consultancy.

3.3.4 Sustained Revenue Corroborates Commercial Execution

The accountant-certified schedules provide an objective measure of continuity. E-IT Technologies reported annual gross revenue as follows: R$3,952,896.89 in 2014; R$5,898,679.32 in 2015; R$8,724,575.99 in 2016; R$9,856,866.58 in 2017; R$9,026,891.50 in 2018; R$12,064,524.27 in 2019; R$10,113,553.13 in 2020; R$8,186,045.97 in 2021; R$12,738,071.08 in 2022; R$14,432,727.92 in 2023; R$12,784,561.59 in 2024; and R$10,590,436.33 in 2025. The twelve-year total was R$118,369,830.57. (Exhibit B.)

Revenue Statement

São Paulo, October 9, 2025

We hereby declare, for all appropriate purposes, that the company E-IT Technologies Consultoria de Informatica Ltda, registered under CNPJ No. 12.349.468/000175, reported the following gross revenues for the periods indicated below.

Year	Amounts
2014	R$ 3,952,896.89
2015	R$ 5,898,679.32
2016	R$ 8,724,575.99
2017	R$ 9,856,866.58
2018	R$ 9,026,891.50
2019	R$ 12,064,524.27
2020	R$ 10,113,553.13
2021	R$ 8,186,045.97
2022	R$ 12,738,071.08
2023	R$ 14,432,727.92
2024	R$ 12,784,561.59
2025	R$ 10,590,436.33
Total	**R$ 118,369,830.57**

E-IT Services reported R$4,403,206.14 in gross revenue from 2018 through 2025. (Exhibit B.) The petition does not equate Brazilian reais with United States dollars or assume identical margins. It also does not treat gross revenue as proof of profit. The schedules are relevant because they demonstrate repeated customer demand and the capacity to maintain business operations across economic cycles. The revenue is consistent with the long-term engagements described independently by the support letters.

The personal tax filings from 2022 through 2025 further document Mr. de Souza's relationship to and income from the businesses. (Exhibit C.II.) They are not offered to expose unnecessary personal financial details or to substitute income for substantive expertise. They corroborate that the businesses and ownership interests reflected in the corporate documents were economically active.

3.3.5 He Has Developed and Deployed Solutions Closely Related to the United States Plan

The strongest evidence of positioning is that Mr. de Souza has already developed and implemented the class of solutions he proposes to adapt and scale.

E-GT (Enhanced Global Trade). E-GT integrates foreign-trade workflows with SAP. The record associates it with import and export operations, customs-related processes, logistics, cost settlement, and enterprise data. Glenn Gunter identifies a successful E-GT implementation in 2012 followed by continued engagements. Leo Anderson describes it as an SAP-integrated system used to streamline import and export operations. Alvaro Marzullo describes related import automation and customs-process work. (Exhibit C.II.) This history is directly relevant to the planned United States trade and supply-chain extensions.

E-GR (Enhanced Goods Receipt). E-GR automates validation and processing of electronic-invoice data and its connection to goods receipt. Glenn Gunter identifies an E-GR inbound-automation implementation in 2015. Leo Anderson states that the system used XML invoice data to improve the speed and security of goods-receipt processing. (Exhibit C.II.) The architecture—document ingestion, validation, exception handling, transaction matching, and ERP posting—is readily relevant to United States customers even though the legal and invoice formats must be adapted.

E-FCI and fiscal integrations. E-FCI addressed a complex Brazil-specific reporting requirement using SAP data. Michael Powell likewise describes Mr. de Souza's work with SPED, fiscal reporting, and digital-invoicing requirements in Corning's global architecture. (Exhibit C.II.) E-IT does not propose to sell Brazilian FCI compliance as a United States requirement. The evidentiary value lies in Mr. de Souza's demonstrated method: analyze dense legal and business rules, convert them into auditable system logic, integrate the logic with a global ERP, and deploy without disrupting operations.

Enterprise recovery and optimization. The 2015 ASUG case shows that E-IT's work was not limited to one proprietary module. The recognized Beauty'in project stabilized SAP ECC 6.0, addressed environment governance, reconciled inventory and stock, revised logistics workflows, trained users, automated an external logistics-operator interface, and improved pricing and budget controls. (Exhibit C.II.) This range closely matches the proposed SAP process-optimization and integration services.

The products and projects provide a credible bridge between past and future. Mr. de Souza is not asking USCIS to infer that general management experience will enable him to start a technical firm. He has already led a technical firm that created relevant solutions, deployed them in demanding environments, retained customers over many years, and generated substantial revenue.

3.3.6 Independent Witnesses Corroborate His Role, Not Merely the Field's Importance

USCIS gives greater weight to letters that are specific, based on first-hand knowledge, and supported by independent evidence. The four completed letters in the record satisfy those characteristics.

Glenn Gunter — Apex Tool Group. Mr. Gunter served as Business Applications Manager when Mr. de Souza supported the Sorocaba manufacturing facility and is identified in the letter as Senior Director, Application Services. He dates the relationship to 2012 and identifies three distinct engagements: E-GT implementation in 2012, a business-system upgrade in 2013, and E-GR implementation in 2015. He reports that the systems supported efficiency, cost control, stable processes, manufacturing requirements, and customer demand, and that Mr. de Souza demonstrated leadership, innovation, deadline management, and collaboration with technical and business users. (Exhibit C.II.) The dated projects align with the company's corporate and revenue chronology.

Leo Anderson — Eastman Chemical Company. Mr. Anderson, Contractor Governance SAP Technical Lead Architect, states that he worked with Mr. de Souza for well over a decade, beginning through Solutia and continuing after its acquisition by Eastman. He describes a complex foreign-trade solution for imports of raw materials and resale goods across continents into South America and specifically identifies E-GT, E-GR, and E-FCI. He emphasizes Mr. de Souza's combination of SAP architecture, logistics, foreign trade, tax compliance, development, business judgment, and coaching. (Exhibit C.II.) This letter supports both technical depth and the ability to transfer knowledge.

Michael Powell — former Corning collaborator and current GAF Materials Corp director. Mr. Powell states that he worked with Mr. de Souza on multiple high-stakes SAP deployments and regulatory integration projects at Corning. He describes direct observation of enterprise architecture that connected technical complexity with operational compliance, including statutory tax, fiscal-reporting, and digital-invoicing integrations. He identifies the ability to translate volatile regulatory rules into stable, scalable software within global systems. (Exhibit C.II.) Although the letter offers opinions on the legal prongs that USCIS will determine independently, its factual descriptions of the work are probative.

Alvaro Marzullo — former senior Corning Latin America executive. Mr. Marzullo states that he worked with Mr. de Souza and E-IT Technologies for approximately seven years while serving in senior Corning leadership roles. He identifies SAP ECC6 implementation and stabilization, specialized foreign-trade-system integration, import automation, bonded-warehouse analysis, customs optimization, and work with executive, operational, consulting, and technical stakeholders. (Exhibit C.II.) His accompanying professional background supports his capacity to evaluate business impact.

The letters are consistent with each other while remaining independently detailed. They identify different customers and perspectives, yet repeatedly describe the same distinguishing abilities: integrated SAP and business knowledge, complex logistics and trade implementation, long-term reliability, scalable solution design, and effective leadership across technical and executive teams. That consistency increases their probative value under the preponderance standard.

3.3.7 The United States Business Plan Is Detailed and Tied to His Record

The business plan defines target customers, service lines, phases of market entry, staffing, pricing and revenue assumptions, startup costs, and a five-year financial model. (Exhibit C.I.) Its strongest feature is not any single forecast. It is the fit between the forecast and Mr. de Souza's demonstrated capabilities.

The initial service lines—SAP process optimization, systems integration, invoice automation, trade and compliance workflows, and custom extensions—are the same lines in which he has products,

training, client implementations, or recognition. The Year 1 model appropriately depends on Mr. de Souza for solution architecture while adding business-development and administrative support. Technical hiring begins as customers and revenue are projected to grow. The later transition toward reusable and recurring offerings mirrors his prior development of E-GT, E-GR, and E-FCI. The target sectors mirror the types of complex, regulated, and supply-chain-intensive environments described by the client witnesses.

The plan also identifies implementation risk rather than assuming immediate profit. It forecasts a Year 1 loss and profitability beginning in Year 2. (Exhibit C.I.) The pro forma statements are planning scenarios, not accomplished financial facts. The second prong does not require certainty, and the petition does not rely on the projections alone. The forecasts are instead evaluated against the staged market-entry sequence and, more importantly, the independent evidence of Mr. de Souza's capacity to finance, manage, and deliver the work.

3.3.8 He Has Documented Access to Launch Capital and Authority to Deploy It

The plan estimates $107,000 in initial funding. (Exhibit C.I.) Independent financial evidence supports access to resources. Domingos Orestes Chiomento of DOC Contabilidade Empresarial states that his accounting firm has served E-IT Technologies since January 1, 2021; that Mr. de Souza is an equity partner and executive manager with control and decision-making authority; that the company has R$1,000,000 in financial availability; and that Mr. de Souza can allocate or distribute resources in accordance with applicable corporate and legal requirements. (Exhibit C.II.)

The Itaú investment statement dated May 11, 2026 reports R$410,425.61 in an investment fund and R$594,593.28 in a certificate-of-deposit product, for a total net balance of R$1,005,018.89 in the name of E-IT Technologies. (Exhibit C.II.) The accountant letter and bank record corroborate one another. Together with the corporate records identifying Mr. de Souza's management authority and ownership, they establish a plausible funding path. The petition recognizes that lawful transfer, currency conversion, company formation, taxation, and ordinary business formalities remain necessary; it does not treat the Brazilian balance as cash already deposited in a United States company.

> Based on the accounting, tax, and financial documentation reviewed in the regular course of professional services, I certify that Mr. **Luciano Aparecido de Souza** holds an ownership interest that grants him control over the aforementioned company, including administrative authority and control over its assets, as provided in its organizational documents.
>
> Additionally, I declare that **E-IT Technologies Consultoria de Informática LTDA** has financial availability in the amount of **R$1.000.000,00** duly reflected in its accounting records and financial statements.

3.3.9 His Record Addresses the Policy Manual's Entrepreneur Factors

The USCIS Policy Manual identifies evidence of ownership and a central role, related education and certifications, prior entrepreneurial achievement, investment, revenue, products, customer use, third-party review, and a detailed plan as potentially probative. These are considerations, not a checklist of conditions that must all be completed in the United States before filing. Mr. de Souza's record satisfies numerous independent categories:

- ownership and central role are established by corporate records showing 85-percent ownership and administrator authority;
- education and training are established by the BBA, graduate logistics study, SAP courses, SAP certification, and CRA-SP registration;

- prior entrepreneurial achievement is established by more than fifteen years of company operation;
- revenue is established by accountant-certified annual schedules and corroborating tax records;
- products and customer use are established by the named E-GT, E-GR, and E-FCI systems and the client letters;
- third-party recognition is established by the ASUG Impact Awards coverage and four detailed support letters;
- financial capacity is established by the accountant declaration and bank investment statement; and
- the proposed activities, staffing, market-entry phases, and financial assumptions are set out in the business plan.

The launch-stage posture does not diminish the probative value of that record. Mr. de Souza is not asking USCIS to credit an untested idea based only on a future business plan. The proposed services extend work already performed; the products and methods have already been used by customers; the founder has already operated and capitalized related enterprises; the launch requirement is supported by documented resources; and independent customers have verified the underlying capabilities over many years. *Dhanasar* asks whether he is positioned to take the next steps, not whether those steps were completed before the petition was filed.

3.3.10 Second-Prong Conclusion

Mr. de Souza is well positioned because his qualifications are cumulative and directly aligned. His education explains the business and logistics processes; his SAP training supplies platform-specific expertise; his long-running companies demonstrate entrepreneurial execution; his products demonstrate solution development; the client letters demonstrate adoption and results; the award evidence provides contemporaneous recognition; the revenue schedules demonstrate sustained commercial activity; the business plan identifies a realistic sequence of United States activities; and the financial evidence supports the ability to fund launch steps.

No one can guarantee the outcome of an entrepreneurial venture, and *Dhanasar* does not require such a guarantee. The record establishes the relevant proposition: among professionals proposing a SAP-centered logistics and enterprise-integration business, Mr. de Souza has an unusually strong combination of related education, certified technical knowledge, product history, multinational implementation experience, long-term client trust, majority ownership, revenue generation, management authority, capital, and a specific plan. He is therefore well positioned to advance the endeavor.

3.4 THIRD PRONG: On Balance, It Would Benefit the United States to Waive the Job-Offer and Labor-Certification Requirements

The third prong asks whether the benefits of the endeavor and Mr. de Souza's positioning, taken together, outweigh the interests ordinarily served by a job offer and permanent labor certification. Labor certification protects United States workers by testing a defined position, offered by a defined employer, in a particular labor market, under minimum stated requirements. That protection is important. In this case, however, the structure of the endeavor, the nature of Mr. de Souza's contribution, and the plan to create rather than occupy subordinate positions make the conventional process a poor fit. The waiver better serves the United States.

3.4.1 A Conventional Job Offer Would Not Capture the Entrepreneurial Endeavor

Mr. de Souza is not proposing to fill a preexisting SAP consultant vacancy for a third-party employer. As E-IT Technologies' founder and General and Operations Manager, he will direct the

founder-controlled launch resources, define the products and methods, exercise the initial solution-architecture responsibility, acquire customers, negotiate engagements, supervise implementation, and hire the team. The job opportunities for other workers arise only after he creates and advances the enterprise. (Exhibits C.I and C.II.)

A labor certification centered on one offered General and Operations Manager position could not evaluate whether the United States should receive the benefits of the underlying venture. It would test whether minimally qualified workers are available for specified duties at a worksite. It would not capture Mr. de Souza's investment, ownership risk, preexisting products, authority to deploy capital, responsibility for creating the employer, or obligation to build a team and a multi-client platform. USCIS's Policy Manual specifically recognizes that, where a person is self-employed in a manner that generally does not adversely affect United States workers or owns a business that provides jobs for United States workers, there may be little benefit from labor certification.

The plan is also inherently multi-client and not tied to a single worksite. E-IT Technologies will serve customers in different sectors and, as it expands, different states. Project needs will vary among logistics, invoicing, integration, trade, and custom-extension work. A single employer-employee job description would narrow the very cross-client and product-development activity that gives the endeavor broader prospective value.

3.4.2 The Endeavor Is Designed to Add United States Jobs and Capabilities

Waiver will not enable E-IT Technologies to replace a United States worker in an existing position. The company is projected to begin with three total workers, including Mr. de Souza, and grow to twelve total workers by Year 5. The eleven additional positions include business-development, administrative, SAP consulting, marketing, project-management, technical-support, senior-architecture, human-resources, customer-success, and finance functions. (Exhibit C.I.)

The proposed hiring sequence protects rather than undermines the values behind labor certification. Technical execution begins with the founder because the architecture and customer methodology derive from his prior work. As revenue and engagements develop, the plan adds United States professionals to deliver, support, and scale those systems. Mr. de Souza's role includes coaching and knowledge transfer; Leo Anderson specifically describes him as a leader-developer who coaches and shares SAP knowledge. (Exhibit C.II.) In this structure, his contribution is complementary to the domestic workforce.

The petition does not contend that the United States lacks all qualified SAP professionals. BLS projections and occupational data are relevant to the importance and continuing demand of the work, but a labor shortage alone would not satisfy the third prong. The balance favors waiver because Mr. de Souza will create a delivery platform, invest capital, adapt existing solutions, and employ others—not because he seeks preferential access to a vacancy.

3.4.3 Mr. de Souza Brings Knowledge and a Record That Minimum Job Requirements Cannot Capture

Labor certification generally examines minimum qualifications for a position. Mr. de Souza's value arises from the combination and depth of experience beyond such minimums:

- a United States-equivalent business degree and graduate logistics study;
- specialized SAP logistics, procurement, delivery, and warehouse training;
- SAP Solution Consultant certification dating to 2007;
- more than fifteen years founding and leading a related software and consulting enterprise;
- majority ownership and formal administrator authority;

- design and implementation experience with E-GT, E-GR, and E-FCI;
- long-term work in multinational manufacturing, chemicals, materials, and foreign-trade environments;
- the ability to translate regulatory and operational rules into integrated enterprise architecture;
- contemporaneous professional recognition; and
- a documented record of commercial revenue and available capital.

(Exhibits B and C.II.) A recruitment test for an operations manager or systems consultant could identify workers meeting a degree-and-experience floor. It could not readily select for the entrepreneurial package at issue: proven products, founder-level authority, cross-domain knowledge, customer history, capital commitment, and responsibility for launching the enterprise.

This distinction is consistent with *Dhanasar*. The third prong may be satisfied where the individual offers contributions of such value that the United States benefits even assuming other qualified workers are available. 26 I&N Dec. at 891. The petition does not argue that Mr. de Souza is the only person capable of SAP integration. It shows that his particular record and assets will produce a different benefit from hiring an otherwise qualified worker into a fixed role.

3.4.4 The United States Will Benefit Even If Other Qualified Workers Are Available

The prospective benefits are additive:

1. **Deployment of proven methods.** Mr. de Souza will adapt architectures developed through prior E-GT, E-GR, fiscal-integration, and enterprise-recovery work. United States customers obtain the benefit of that accumulated implementation record rather than a first-time design exercise.
2. **Capital formation and business creation.** He will commit founder-controlled resources to establish the operation. The accountant and bank evidence corroborate access to more than R$1 million in business investment assets against a stated initial requirement of $107,000. (Exhibits C.I and C.II.)
3. **Reusable capacity.** The venture will convert consulting knowledge into modular extensions, accelerators, and subscription services that can be deployed across customers. The value therefore is not limited to one employer's internal system.
4. **Domestic employment and training.** The company plans eleven positions in addition to Mr. de Souza by Year 5 and a payroll projected at $668,000 annually. Those workers will acquire experience in SAP integration, logistics, project delivery, support, and customer success. (Exhibit C.I.)
5. **Support for consequential operational systems.** The services target the ERP, logistics, inventory, invoicing, and trade workflows that support manufacturing and goods movement. NIST, CBP, Treasury, Census, and BLS sources establish the importance of interoperable manufacturing data, supply-chain visibility, electronic invoicing, and systems-oriented logistics.
6. **Fiscal and downstream economic activity.** The plan projects cumulative federal and state tax payments of approximately $259,266 over five years and anticipates spending on professional services, technology, facilities, marketing, and contractors. (Exhibit C.I.) These projections are secondary supportive factors rather than the core of the waiver request.

The availability of other workers does not negate any of these benefits. A qualified United States consultant could be hired by an existing company, and E-IT's plan anticipates hiring such professionals. What depends on Mr. de Souza is the creation and direction of this particular enterprise and the adaptation of the products and methods he has spent years developing.

3.4.5 The Balance Does Not Depend on an Unsupported Claim of Emergency

Some waivers involve a discrete, urgent public-health or national-security need. That is one possible third-prong factor, not a universal requirement. *Dhanasar* expressly replaced the former test with a more flexible balancing inquiry that does not require proof of harm to the national interest or comparison against United States workers. This petition does not claim that approval of one enterprise-systems company will resolve a national emergency. It instead relies on the cumulative balance recognized by *Dhanasar* and the Policy Manual: the entrepreneurial structure makes labor certification impractical; the founder's knowledge and assets exceed what minimum job requirements would capture; the endeavor is designed to create United States positions; the services support nationally consequential operational systems; and the benefits remain additive even if qualified workers are available.

Timeliness still has practical relevance. Manufacturing, trade, and enterprise systems continue to modernize. CBP is pursuing ACE modernization; NIST identifies the transition of advanced manufacturing technologies, interoperability, workforce capacity, and supply-chain resilience as continuing concerns; and BLS projects growth in the related systems, management, and logistics occupations. Delaying the founder's ability to organize, fund, and direct the venture would defer those contributions. But the waiver request does not rise or fall on urgency alone.

3.4.6 Third-Prong Conclusion

The labor-certification process offers limited value where the self-petitioner will create the employer, invest the launch capital, supply the underlying products and methods, serve multiple customers, and hire United States workers. By contrast, waiver permits the United States to receive the benefit of a proven entrepreneur's integrated business, logistics, foreign-trade, and SAP expertise and the domestic activity it will support.

The record also protects against the concern that "entrepreneur" is merely a label. Mr. de Souza has operated a related company since 2010; holds majority ownership and management authority; has independently documented revenue; developed and deployed relevant systems; earned professional recognition; obtained detailed client support; produced a specific United States plan; and documented access to capital. (Exhibits B, C.I, and C.II.) On balance, the national benefits of permitting him to advance the endeavor outweigh the benefits of requiring a job offer and labor certification.

4. FINAL CONSIDERATIONS - CONCLUSION

The record establishes, by a preponderance of the evidence, that Mr. de Souza qualifies for the requested classification and waiver.

1. **He satisfies the EB-2 threshold.** His foreign education is equivalent to a United States Bachelor of Business Administration plus one year of graduate study in logistics. That degree was followed by far more than five years of progressive experience in the specialty, establishing the equivalent of an advanced degree under 8 C.F.R. § 204.5(k)(2). Alternatively, his related academic record, SAP certification, professional registration, sustained experience, contemporaneous recognition, client-validated contributions, entrepreneurial leadership, and commercial record establish exceptional ability in business.
2. **The endeavor has substantial merit and national importance.** E-IT Technologies will deliver and scale SAP-centered integration, logistics, goods-receipt, electronic-invoicing, trade-workflow, and enterprise-automation solutions for multiple United States customers. The work has operational merit, and its reusable, multi-client, multi-sector, nationwide design gives it prospective implications beyond a single employer. Official sources confirm the national

significance of advanced-manufacturing competitiveness, interoperable data, supply-chain visibility, electronic invoicing, and systems-oriented logistics.

3. **Mr. de Souza is well positioned.** His education and certifications align directly with the endeavor. He has more than fifteen years leading a related enterprise; current majority ownership and management authority; named products; independently described multinational implementations; a recognized SAP enterprise-recovery project; accountant-certified revenue; detailed support from four client-side professionals; a specific United States plan; and documented access to founder-controlled resources.
4. **The balance favors waiver.** A conventional labor certification would test a fixed job rather than the founder's creation, capitalization, architecture, and expansion of a multi-client enterprise. The plan adds eleven United States positions beyond Mr. de Souza, transfers knowledge, and benefits United States organizations even if other qualified workers are available. Waiver advances, rather than compromises, the interests underlying the labor-certification system.

For these reasons, Mr. de Souza respectfully requests approval of his Form I-140 petition as a member of the professions holding the equivalent of an advanced degree or, in the alternative, as an individual of exceptional ability in business, together with a National Interest Waiver under INA § 203(b)(2)(B)(i).

Thank you for your time and consideration to Mr. De Souza's application.

Respectfully submitted,



Otavio Haverroth Silva
California Bar # 343486

Exhibit list

Exhibits:	Pages:
Exhibit A	
Curriculum Vitae of Luciano Aparecido de Souza	1-13
Exhibit B - Advanced Degree Eligibility	
Bachelor of Business Administration, with a Concentration in Foreign Trade – Diploma, Certificate, and Academic Transcripts – Methodist University of São Paulo (UMESP)	14-30
Graduate Study in Logistics – MBA Diploma, Certificate, and Supporting Academic Records – Fundação Getulio Vargas (FGV)	31-36
Academic Credential Evaluation – Carnegie Evaluations LLC, including the evaluator's curriculum vitae and supporting academic references	37-60
Exhibit B - Professional Experience and Business Activity:	
Accountant-Certified Revenue Schedule – E-IT Services Consultoria de Informática Ltda.	61-63
Accountant-Certified Revenue Schedule – E-IT Technologies Consultoria de Informática Ltda.	64-66
Corporate Records, Amendments, and Contracts – E-IT Technologies Consultoria de Informática Ltda.	67-102
Corporate Records, Amendments, and Contracts – E-IT Services Consultoria de Informática Ltda.	103-142
Exhibit C.I – First Prong – Substantial Merit and National Importance	
Business Plan for E-IT Technologies – Austin, Texas	143-208

Government and Policy Materials Supporting Advanced Manufacturing, Enterprise-System Interoperability, Supply-Chain Visibility, Electronic Invoicing, Trade Modernization, and Related Professional Demand:	209-414

Exhibit C.II – Second Prong – Well Positioned to Advance the Proposed Endeavor

All documents contained in Exhibit B	415

Exhibit C.II – Second Prong – Professional Licenses and Certifications

Professional Registration as an Administrator – Regional Council of Administration of São Paulo (CRA-SP)	416-418
SAP Solution Consultant Certification – SCM–Procurement with mySAP ERP 2005	419

Exhibit C.II - Second Prong: Courses and Additional Professional Qualifications

SAP Courses and Certificates	420-430
Other Professional Courses and Certificates	431-435

Exhibit C.II - Second Prong: Evidence of Professional Recognition

ASUG Brasil Impact Awards (2015) – Second-Place Recognition for the Beauty'in SAP Enterprise-Recovery Project and Supporting Publication	436-444

Exhibit C.II - Second Prong: Evidence of Compensation and Professional Standing

Brazilian Individual Income Tax Returns – Tax Years 2022 through 2025	445-525
Glassdoor Salary Benchmark Evidence – Chief Technology Officer / Technology Director in Brazil	526-530

Exhibit C.II - Second Prong: Evidence of Financial Viability and Company Assets

Accountant's Letter concerning E-IT Technologies' financial availability and Mr. de Souza's ownership, management authority, and capacity to allocate company resources	531-535
Itaú Consolidated Investment Position – E-IT Technologies Consultoria de Informática Ltda.	536-538

Exhibit C.II - Second Prong: Letters of Support

Mr. Glenn Gunter – Senior Director, Application Services, Apex Tool Group, LLC	539
Mr. Leo Anderson – Contractor Governance SAP Technical Lead Architect, Eastman Chemical Company	540-541
Mr. Michael Powell – Director, IT Product Management – Manufacturing Operations & Supply Chain	542-546
Mr. Alvaro Piero Marzullo – Vice President, Latin America & Caribbean, CAMIN Cargo Control, with supporting curriculum vitae	547-554

Exhibit D - Personal Documents

Birth Certificate and Corresponding Certified English Translation	555-557
Passport Biographical Page	558
United States Visa	559
Marriage Certificate and Corresponding Certified English Translation	560-562
Derivative’s Birth Certificate and Corresponding Certified English Translation	563-571
Derivative’s Passport Biographical Page	572-574
Derivative’s United States Visa	575-577

Exhibit A

LUCIANO APARECIDO DE SOUZA

Email | luapbr@gmail.com

Phone | +55 11 98163 6332

Professional with over 20 years of experience in technology and business process management, with a strong focus on the SAP ecosystem for logistics, foreign trade, and fiscal integration. Founder and CEO of E-IT Technologies since 2010, leading the development of solutions used by large multinational corporations across multiple Latin American countries. Specialist in the implementation and optimization of SAP systems, with a proven track record in leading complex projects and delivering operational efficiency and tax compliance. Recognized by the industry, with participation in projects awarded by ASUG Brasil. Possesses a solid background in Business Administration and Logistics, with international experience in high-complexity corporate environments.

WORK EXPERIENCE

CEO / CO-FOUNDER

E-IT Technologies | São Paulo, São Paulo - Brazil |

10/2010 - PRESENT

- Executive leadership of a Software House specialized in add-on products for the SAP ecosystem (R/3 and ECC), with a focus on logistics, tax, and foreign trade.
- Multidisciplinary team management with over 40 employees and support for a portfolio of more than 70 multinational corporations (e.g., Volkswagen, Pfizer, Merck).
- Responsible for the company's international expansion, implementing solutions for fiscal and customs compliance in Brazil, Ecuador, Peru, Colombia, Chile, and Argentina.
- Achieved 2nd Place at the 2015 ASUG Impact Awards with a project focused on business control recovery and logistics integration for the company Beauty'in.

SAP TECHNICAL LEADER

ContourGlobal | São Paulo, São Paulo - Brazil

06/2015 - 05/2017

- NeoEnergia Carve-out Project: Technical leadership in the acquisition of 6 companies across 4 different states, being responsible for the complete Rollout configuration of MM/SD modules for 15 industrial plants.
- Brazil Localization: Review and implementation of the Brazilian localization (taxes and fiscal regulations) for new company codes and manufacturing plants.
- Strategic Data Migration: Design and execution of data load programs (LSMW) for migrating material master data, inventory balances, business partners (Vendor/Customer), and general ledger accounts (G/L), ensuring the integrity of the systemic transition.
- Financial Re-implementation (FI-AA): Leadership in the re-implementation of the Fixed Assets module (FI-AA), performing the revaluation of assets to market value (current value).

- Operational Efficiency: Optimization of the Inbound system (goods/invoice receipt) to reduce manual tasks and processing time.
- Leadership and Training: Responsible for training Key Users and compiling all technical project documentation in an English-driven work environment.

SAP PROJECT MANAGER

Apex Tool Group, LLC | Sorocaba, São Paulo - Brazil

06/2013 - 01/2014

- Project Management and Planning: Leadership and strategic planning of SAP projects, ensuring adherence to schedules and the delivery of highly complex solutions.
- Quality Assurance (QA): Quality management in the implementation and processes of MM (Materials), SD (Sales), and FI (Financial) modules, ensuring the integrity of the delivered solutions.
- Solution Architecture: Technical evaluation of solution proposals across different SAP modules and designing integration strategies between the ERP and legacy systems.
- Change Management: Leadership in organizational change management processes resulting from new systemic implementations.

SAP PROJECT MANAGER

Schneider Electric | São Paulo, São Paulo - Brazil

01/2013 - 07/2013

- Multi-site Coordination: Leadership of distributed teams across 5 different sites located in 3 Brazilian states, ensuring process alignment on a large scale.
- Stakeholder Management: Responsible for reporting directly to the Steering Committee, presenting performance indicators, risks, and critical project status.
- Schedule Design: Technical development and rigorous tracking of the activity schedule to ensure delivery within corporate deadlines.
- Evaluation of Complex Solutions: Analysis of solution proposals across multiple SAP modules and consulting for integration with the company's legacy systems.
- Global Environment: Full-time performance in English, following Schneider Electric's international standards and methodologies.

SAP MM CONSULTANT

Voith AG | São Paulo, São Paulo - Brazil

04/2009 - 02/2012

- MM Technical Configuration: Responsible for the comprehensive configuration of the Materials Management (MM) module, ensuring system alignment with paper and energy production processes.
- Brazil Localization: Technical execution of the Brazilian localization, ensuring that all national fiscal and tax regulations were correctly integrated into the SAP ERP.
- International Support (USA): Acting in direct support to users in the United States, demonstrating technical and operational fluency in a global environment.
- Maintenance and New Developments: Management of ongoing support and leadership in new systemic developments for performance improvement and process automation.

- Documentation and Training: Development of technical process documentation and conducting training for Key Users, facilitating the adoption of new functionalities within the corporate environment.

SAP MM Consultant

GE Energy | São Paulo, São Paulo - Brazil

10/2008 - 04/2009

- Acted in the implementation of SAP 4.6C with a focus on architecture and process design (BBP Design) for the MM module, integrating the Brazilian localization and defining technical specifications for developments in ABAP language.

SAP MM Consultant

Osram Sylvania | Brazil / Ecuador / Peru / Colombia

03/2008 - 10/2008

- Led the regional rollout of the SAP 4.6C system for Osram units in Peru, Colombia, and Ecuador.
- Due to high commitment and success in project delivery, was formally honored with a Diploma of Recognition awarded by Osram's board of directors.

SAP MM Consultant

Tenda Atacado | São Paulo, São Paulo - Brazil

01/2008 - 02/2008

- Specialist responsible for implementing the MM-CBP module in SAP 4.7, performing complex technical adaptations to support retail planning requirements in an environment without the IS-Retail module.
- Developed special programs, including customized forecasting (Forecast), BADIs, and strategic reports to optimize the supply flow between the company's 10 stores and distribution center.

SAP FI-AA consultant

3 Corações S/A | Fortaleza, Ceará - Brazil

09/2007 - 12/2007

- Acted in the design and implementation of the Fixed Assets (FI-AA) module in SAP 4.7 for the second-largest coffee group in Brazil.
- Was responsible for the technical configuration of the Brazilian localization, handling critical issues such as CIAP and taxes (PIS/COFINS), as well as leading data migration through customized programs in ABAP language.

SAP MM Consultant

Prysmian | Sorocaba, São Paulo - Brazil

06/2007 - 07/2007

- Technical consulting focused on the design and implementation of the External Services Management (MM-SRV) sub-module in SAP 4.6C for the global leader in high-tech cables.

SAP MM Consultant

B.GROB do Brasil | São Paulo, São Paulo - Brazil

08/2006 - 06/2007

- Responsible for the design and configuration of the MM module in SAP 4.7 for the German machining centers multinational.

SAP MM Consultant

Gebrüder Heller Maschinenfabrik GmbH | Sorocaba, São Paulo - Brazil

08/2005 - 05/2006

- Led the process design (BBP) and technical configuration of the Brazilian localization within the MM module for the German multinational. Responsible for configuring tax codes and withholding taxes, as well as developing customization documentation.

SAP MM / PWCE consultant

Petroflex | Brazil

01/2005 - 07/2005

- Responsible for defining the Brazilian localization for import processes, system gap mapping, and leading data migration utilizing LSMW tools and customized ABAP programs for the company's three industrial plants.

SAP MM / PWCE consultant

EMS Sigma Pharma S/A | Hortolândia, São Paulo - Brazil

06/2004 - 01/2005

- Technical experience in SAP MM module implementation and support projects within manufacturing and technology industries. Responsible for process design, Brazilian localization configuration, and end-user support during the critical phases of Go-live and system stabilization.

SAP MM / PWCE consultant

Embraco | Joinville, Santa Catarina - Brazil

04/2004 - 06/2004

- Implementation of an add-on solution focused on Foreign Trade processes to bridge gaps within the SAP Brazilian localization. Acted in program design, pricing configuration (Pricing), tax codes, and user training, integrating the solution with FI, MM, CO, and AM modules.

SAP MM Consultant

Videolar S/A | Manaus, Amazonas - Brazil

02/2004 - 04/2004

- Technical leader in the restructuring and stabilization of the SAP 4.6C environment following failures in the original implementation. Performed the review of the organizational structure (Enterprise structure), redefinition

of customized configurations, pricing and Brazilian localization configuration, ensuring business process continuity for AM, FI, MM, PP, and SD modules.

SAP MM / PWCE CONSULTANT

CMR Indústria e Comércio Ltda. | São Paulo, São Paulo - Brazil

07/2003 - 01/2004

- Acted in the SAP 4.7 implementation for a textile industry with international operations. Responsible for process design (BBP), technical configuration of the materials management module, and Brazilian localization. Led data migration utilizing LSMW tools and customized ABAP programs, integrating the plant in Brazil with representative offices in Argentina and France.

ACADEMIC BACKGROUND

BACHELOR'S DEGREE IN BUSINESS ADMINISTRATION (EMPHASIS IN FOREIGN TRADE)

Methodist University of São Paulo

São Bernardo do Campo, São Paulo - Brazil

03/2003

Focus on Foreign Trade Systems, International Economics, and Customs and Tax Legislation.

GRADUATE DEGREE IN BUSINESS LOGISTICS

Getulio Vargas Foundation (FGV)

Rio de Janeiro, Rio de Janeiro - Brazil

09/2004

Focus on Global Logistics, Competitive Strategies, and Supply Chain.

MAIN COURSES / SEMINARS

- **SCM631: ADDITIONAL TOPICS IN WAREHOUSE MANAGEMENT | SAP BRASIL | 06/2006**
- **SCM630: WAREHOUSE MANAGEMENT | SAP BRASIL | 06/2006**
- **SCM610: DELIVERY PROCESSES | SAP BRASIL | 05/2006**
- **SCM601: PROCESSES IN LOGISTICS EXECUTION | SAP BRASIL | 03/2006**
- **FOREIGN EXCHANGE AND INTERNATIONAL BANKING OPERATIONS IN FOREIGN TRADE | ADUANEIRAS 08/2002**
- **INTERNATIONAL TRANSPORTATION AND CARGO UNITIZATION | ADUANEIRAS | 08/2002**

CERTIFICATIONS

- **SAP CERTIFIED SCM - PROCUREMENT WITH MY SAP ERP 2005 - 04/2007**

PROFESSIONAL LICENSE

CRA-SP - REGIONAL COUNCIL OF BUSINESS ADMINISTRATION

01218815034

AWARDS AND HONORS

- **2nd PLACE - ASUG IMPACT AWARDS 2015**
  ASUG Brasil (Brazilian SAP Users Association) | 2015

  Awarded for the "Beauty'in Case Study: Recovering Business Control", recognized as one of the most successful, innovative, and excellent technology implementation projects within the SAP ecosystem in Brazil. The award is the premier distinction of the SAP community in the country for cases with a transformative impact on business.

07/2026.

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.

LUCIANO APARECIDO DE SOUZA

E-mail | luapbr@gmail.com

Telefone | +55 11 98163 6332

Profissional com mais de 20 anos de experiência em tecnologia e gestão de processos de negócios, com forte atuação no ecossistema SAP voltado para logística, comércio exterior e integração fiscal. Fundador e CEO da E-IT Technologies desde 2010, liderando o desenvolvimento de soluções utilizadas por grandes corporações multinacionais em múltiplos países da América Latina. Especialista em implementação e otimização de sistemas SAP, com histórico comprovado na condução de projetos complexos e na entrega de eficiência operacional e conformidade tributária. Reconhecido pela indústria, com participação em projetos premiados pela ASUG Brasil. Possui sólida formação em Administração e Logística, com atuação internacional em ambientes corporativos de alta complexidade.

EXPERIÊNCIA

CEO / CO-FOUNDER

E-IT Technologies | São Paulo, SP – Brasil |

10/2010 – PRESENTE

- Liderança executiva de uma Software House especializada em produtos *add-on* para o ecossistema SAP (R/3 e ECC), com foco em logística, tax e comércio exterior.
- Gestão de equipe multidisciplinar com mais de 40 colaboradores e suporte a uma carteira de mais de 70 corporações multinacionais (ex: Volkswagen, Pfizer, Merck).
- Responsável pela expansão internacional da empresa, implementando soluções em conformidade fiscal e aduaneira no Brasil, Equador, Peru, Colômbia, Chile e Argentina.
- Conquista do 2° Lugar no ASUG Impact Awards 2015 com o projeto de recuperação de controle empresarial e integração logística para a empresa Beauty'in.

SAP TECHNICAL LEADER

ContourGlobal | São Paulo, SP – Brasil

06/2015 – 05/2017

- Projeto de Carve-out NeoEnergia: Liderança técnica na aquisição de 6 empresas em 4 estados diferentes, sendo responsável pela configuração completa de *Rollout* dos módulos MM/SD para 15 plantas industriais.
- Localização Brasil: Revisão e implementação da localização brasileira (impostos e normas fiscais) para novos *company codes* e unidades fabris.
- Migração de Dados Estratégicos: Design e execução de programas de carga (LSMW) para migração de dados mestres de materiais, saldos de estoque, parceiros de negócios (Vendor/Customer) e contas contábeis (G/L), garantindo a integridade da transição sistêmica.
- Reimplementação Financeira (FI-AA): Liderança na reimplementação do módulo de Ativo Imobilizado (FI-AA), realizando a reavaliação de ativos para valor de mercado (*current value*).

- Eficiência Operacional: Otimização do sistema de *Inbound* (entrada de notas/mercadorias) para redução de atividades manuais e tempo de processamento.
- Liderança e Treinamento: Responsável pelo treinamento de *Key Users* e por toda a documentação técnica do projeto em ambiente de trabalho conduzido em Inglês.

SAP PROJECT MANAGER

Apex Tool Group, LLC | Sorocaba, SP – Brasil

06/2013 – 01/2014

- Gestão de Projetos e Planejamento: Atuação na liderança e no planejamento estratégico de projetos SAP, garantindo o cumprimento de cronogramas e entregas de alta complexidade.
- Garantia de Qualidade (QA): Gestão da qualidade nas implementações e processos dos módulos MM (Materiais), SD (Vendas) e FI (Financeiro), assegurando a integridade das soluções entregues.
- Arquitetura de Soluções: Avaliação técnica de propostas de solução em diferentes módulos SAP e desenho de estratégias de integração entre o ERP e sistemas legados.
- Gestão de Mudanças (Change Management): Liderança nos processos de gestão de mudanças organizacionais decorrentes de novas implementações sistêmicas.

SAP PROJECT MANAGER

Schneider Electric | São Paulo, SP — Brasil

01/2013 – 07/2013

- Coordenação Multi-site: Liderança de equipes distribuídas em 5 unidades (*sites*) diferentes, localizadas em 3 estados do Brasil, garantindo o alinhamento de processos em larga escala.
- Gestão de Stakeholders: Responsável pelo reporte direto ao *Steering Committee* (Comitê de Direção), apresentando indicadores de performance, riscos e status crítico do projeto.
- Desenho de cronograma: Elaboração técnica e acompanhamento rigoroso do cronograma de atividades para assegurar a entrega dentro dos prazos corporativos.
- Avaliação de soluções complexas: Análise de propostas de soluções em múltiplos módulos SAP e consultoria para integração com sistemas legados da companhia.
- Ambiente Global: Atuação integral em Inglês, seguindo os padrões e metodologias internacionais da Schneider Electric.

SAP MM CONSULTANT

Voith AG | São Paulo, SP — Brasil

04/2009 – 02/2012

- Configuração Técnica MM: Responsável pela configuração integral do módulo de Gestão de Materiais (MM), garantindo a aderência do sistema aos processos produtivos de papel e energia.
- Localização Brasil: Execução técnica da localização brasileira, assegurando que todas as regras fiscais e tributárias nacionais fossem integradas corretamente ao ERP da SAP.
- Suporte Internacional (USA): Atuação no suporte direto a usuários dos Estados Unidos, demonstrando fluência técnica e operacional em ambiente global.
- Manutenção e Novos Desenvolvimentos: Gestão de suporte contínuo e liderança em novos desenvolvimentos sistêmicos para melhoria de performance e automação de processos.

- Documentação e Capacitação: Elaboração de documentação técnica de processos e condução de treinamentos para *Key Users*, facilitando a adoção de novas funcionalidades no ambiente corporativo.

SAP MM Consultant

GE Energy | São Paulo, SP — Brasil

10/2008 – 04/2009

- Atuou na implementação do SAP 4.6C com foco na arquitetura e design de processos (*BBP Design*) para o módulo MM, integrando a localização brasileira e definindo especificações técnicas para desenvolvimentos em linguagem ABAP.

SAP MM Consultant

Osram Sylvania | Brasil / Equador / Peru / Colômbia

03/2008 – 10/2008

- Liderou o *rollout* regional do sistema SAP 4.6C para as unidades da Osram no Peru, Colômbia e Equador.
- Pelo alto compromisso e sucesso na entrega do projeto, foi formalmente homenageado com um Diploma de Reconhecimento concedido pela diretoria da Osram.

SAP MM Consultant

Tenda Atacado | São Paulo, SP — Brasil

01/2008 – 02/2008

- Especialista responsável pela implementação do módulo MM-CBP no SAP 4.7, realizando adaptações técnicas complexas para suportar os requisitos de planejamento de varejo em um ambiente sem o módulo IS-Retail.
- Desenvolveu programas especiais, incluindo previsões customizadas (Forecast), BADI's e relatórios estratégicos para otimizar o fluxo de suprimentos entre as 10 lojas e o centro de distribuição da companhia.

SAP FI-AA Consultant

3 Corações S/A | Fortaleza, CE — Brasil

09/2007 – 12/2007

- Atuou no design e implementação do módulo de Ativos Imobilizados (FI-AA) no SAP 4.7 para o segundo maior grupo de café do Brasil.
- Foi responsável pela configuração técnica da localização brasileira, tratando de temas críticos como CIAP e impostos (PIS/COFINS), além de liderar a migração de dados através de programas customizados em linguagem ABAP.

SAP MM Consultant

Prysmian | Sorocaba, SP — Brasil

06/2007 – 07/2007

- Consultoria técnica focada no design e implementação do sub-módulo de Serviços (MM-SRV) no SAP 4.6C para a líder global em cabos de alta tecnologia.

SAP MM Consultant

B.GROB do Brasil | São Paulo, SP — Brasil

08/2006 – 06/2007

- Responsável pelo design e configuração do módulo MM no SAP 4.7 para a multinacional alemã de centros de usinagem.

SAP MM Consultant

Gebrüder Heller Maschinenfabrik GmbH | Sorocaba, SP — Brasil

08/2005 – 05/2006

- Liderou o design de processos (*BBP*) e a configuração técnica da localização brasileira no módulo MM para a multinacional alemã. Responsável pela configuração de códigos de imposto (*Tax codes*) e impostos retidos (*Withholding taxes*), além da elaboração de documentação de customização.

SAP MM / PWCE Consultant

Petroflex | Brasil

01/2005 – 07/2005

- Responsável pela definição da localização brasileira para processos de importação, mapeamento de lacunas sistêmicas e liderança na migração de dados utilizando ferramentas LSMW e programas ABAP customizados para as três plantas industriais da companhia.

SAP MM / PWCE Consultant

EMS Sigma Pharma S/A | Hortolândia, SP — Brasil

06/2004 – 01/2005

- Atuação técnica em projetos de implementação e suporte do módulo SAP MM em indústrias de manufatura e tecnologia. Responsável pelo design de processos, configuração de localização brasileira e suporte ao usuário final durante as fases críticas de *Go-live* e estabilização de sistemas.

SAP MM / PWCE Consultant

Embraco | Joinville, SC — Brasil

04/2004 – 06/2004

- Implementação de solução *add-on* focada em processos de Comércio Exterior para cobrir lacunas da localização brasileira no SAP. Atuou no design de programas, configuração de precificação (*Pricing*), códigos de impostos e treinamento de usuários, integrando a solução aos módulos FI, MM, CO e AM.

SAP MM Consultant

Videolar S/A | Manaus, AM — Brasil

02/2004 – 04/2004

- Líder técnico na reestruturação e estabilização do ambiente SAP 4.6C após falhas na implementação original. Realizou a revisão da estrutura organizacional (*Enterprise structure*), redefinição de parametrizações

customizadas, configuração de precificação e localização brasileira, garantindo a continuidade dos processos de negócio para os módulos AM, FI, MM, PP e SD.

SAP MM / PWCE CONSULTANT

CMR Indústria e Comércio Ltda. | São Paulo, SP — Brasil

07/2003 – 01/2004

- Atuou na implementação do SAP 4.7 para indústria do setor têxtil com operações internacionais. Responsável pelo design de processos (*BBP*), configuração técnica do módulo de gestão de materiais e localização brasileira. Liderou a migração de dados utilizando ferramentas LSMW e programas customizados em ABAP, integrando a planta no Brasil aos escritórios de representação na Argentina e na França.

EDUCAÇÃO

BACHAREL EM ADMINISTRAÇÃO DE EMPRESAS (FOREIGN TRADE EMPHASIS)

Universidade Metodista de São Paulo

São Bernardo do Campo, SP — Brasil

03/2003

Foco em Sistemas de Comércio Exterior, Economia Internacional e Legislação Aduaneira e Tributária.

PÓS-GRADUAÇÃO EM LOGÍSTICA EMPRESARIAL

Fundação Getulio Vargas (FGV)

Rio de Janeiro, RJ — Brasil

09/2004

Foco em Logística Global, Estratégias Competitivas e Cadeia de Suprimentos.

PRINCIPAIS CURSOS / SEMINÁRIOS

- **SCM631: ADDITIONAL TOPICS IN WAREHOUSE MANAGEMENT | SAP BRASIL | 06/2006**
- **SCM630: WAREHOUSE MANAGEMENT | SAP BRASIL | 06/2006**
- **SCM610: DELIVERY PROCESSES | SAP BRASIL | 05/2006**
- **SCM601: PROCESSES IN LOGISTICS EXECUTION | SAP BRASIL | 03/2006**
- **CÂMBIO E OPERAÇÕES BANCÁRIAS INTERNACIONAIS NO COMÉRCIO EXTERIOR | ADUANEIRAS | 08/2002**
- **TRANSPORTES INTERNACIONAIS E UNITIZAÇÃO DE CARGAS | ADUANEIRAS | 08/2002**

CERTIFICAÇÕES

- **SAP CERTIFIED SCM — PROCUREMENT WITH MYSAP ERP 2005 – 04/2007**

LICENÇA PROFISSIONAL

CRA-SP – CONSELHO REGIONAL DE ADMINISTRAÇÃO

01218815034

PRÊMIOS E HONRARIAS

- **2º LUGAR – ASUG IMPACT AWARDS 2015**
  ASUG Brasil (Associação de Usuários SAP Brasil) | 2015

  Premiado pelo "Case Beauty'in: Recuperando o Controle Empresarial", reconhecido como um dos projetos de maior sucesso, inovação e excelência em implementação tecnológica no ecossistema SAP no Brasil. O prêmio é a principal distinção da comunidade SAP no país para casos de impacto transformador em negócios.

07/2026.

Exhibit B - Advanced Degree Eligibility

Methodist
University
of São Paulo

C E R T I F I C A T E

The Methodist University of São Paulo – UMESP – hereby confers upon

Luciano Aparecido de Souza

R.G. No. 35.803.491-7 this Certificate of BACHELOR'S DEGREE IN BUSINESS ADMINISTRATION, for the completion of the BUSINESS ADMINISTRATION PROGRAM WITH A CONCENTRATION IN FOREIGN TRADE, in the academic year of 2002, whose graduation date coincides with the issuance of this certificate, in accordance with the law and the general regulations of this University.

São Bernardo do Campo, March 13, 2003.

-----// signature //-----
Prof. Antonio Cleiton Ramos Negreiro
Academic Secretary

-----// signature //-----
Prof. Ms. Luiz Silvério Silva
Head of the School of Administrative Sciences

Scanned with CamScanner

METHODIST UNIVERSITY OF SÃO PAULO – UMESP
SCHOOL OF ADMINISTRATIVE SCIENCES
BUSINESS ADMINISTRATION PROGRAM – Concentration in Foreign Trade
Recognized by Decree No. 79.856 of
07/23/197, Federal Official Gazette of 07/24/1977.

Scanned with CamScanner

I, Raphael Michels Fantinato de Moura, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Raphael Michels Fantinato de Moura. **Date: November 10, 2025.**

Universidade Metodista de São Paulo

UMESP

REPÚBLICA FEDERATIVA DO BRASIL
ORDEM E PROGRESSO

CERTIFICADO

A Universidade Metodista de São Paulo – UMESP – confere a

Luciano Aparecido de Souza

R.G. nº35.803.491-7 o presente certificado de Bacharel em Administração pela conclusão do curso de Administração com Habilitação em Comércio Exterior, no ano letivo de 2002 , cuja data de colação de grau é a mesma da expedição deste certificado, nos termos da lei e do regimento geral desta Universidade.

São Bernardo do Campo, 13 de março de 2003.

Prof. Antonio Cleiton Ramos Negreiro
Secretário Acadêmico

Prof.Ms. Luiz Silvério Silva
Diretor da Fac. de Ciências Administrativas

Universidade Metodista de São Paulo

Scanned with CamScanner

UNIVERSIDADE METODISTA DE SÃO PAULO - UMESP
FACULDADE DE CIÊNCIAS ADMINISTRATIVAS
CURSO DE ADMINISTRAÇÃO - Habilitação Em Comercio Exterior
Reconhecido pelo Decreto Nº 79.856 DE
23/07/1977 D.O.U. de 24/07/77.

Scanned with CamScanner



Methodist University of São Paulo

School of Administrative Sciences

Methodist University of São Paulo

The President of the Methodist University of São Paulo, in the exercise of his legal duties and considering the completion of the *Business Administration Program* on *03/13/2003*, hereby confers the degree of *Bachelor of Business Administration* upon

Luciano Aparecido de Souza

Brazilian, RG No. *35.803.491-7/SP*, born on *08/15/1979*, in the *State of São Paulo*, and grants him this diploma, so that he may enjoy all legal rights and prerogatives.

São Bernardo do Campo, January 21, 2008.

-----// signature //-----
Prof. Maria Aparecida Fernandes Ribeiro
Academic Secretary

-----// signature //-----
Graduate

-----// signature //-----
Prof. Dr. Marcio de Moraes
President

Scanned with CamScanner

METHODIST UNIVERSITY OF SÃO PAULO
SCHOOL OF ADMINISTRATIVE SCIENCES
BUSINESS ADMINISTRATION PROGRAM
Recognized by Decree No. 79.856 of 07/23/197,
Federal Official Gazette of 07/24/1977

METHODIST UNIVERSITY OF SÃO PAULO
SCHOOL OF ADMINISTRATIVE SCIENCES

APOSTILLE

The graduate completed, in this School, the concentration in:
FOREIGN TRADE

São Bernardo do Campo, January 21, 2008.

-----// signature //-----
Academic Secretary

METHODIST UNIVERSITY OF SÃO PAULO
Diploma registered under No. **15419**
Process No. **15419/08** in accordance to Article 48, §1 of Law No. 9394/96
São Bernardo do Campo, January 21, 2008.
-----// signature //-----
Marcia Maciel
Diploma Registration Division
Approved by: -----// signature //-----
Prof. Maria Aparecida Fernandes Ribeiro
Academic Secretary

Scanned with CamScanner

I, Raphael Michels Fantinato de Moura, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Raphael Michels Fantinato de Moura. **Date: November 10, 2025.**



Universidade Metodista de São Paulo

Faculdade de Ciências Administrativas

O Reitor da Universidade Metodista de São Paulo, no uso de suas atribuições legais e tendo em vista a conclusão do *Curso de Administração* em *13/03/2003*, confere o título de *Bacharel em Administração* a

Luciano Aparecido de Souza

nacionalidade *brasileira*, RG nº *35.803.491-7/SP*, nascido a *15/08/1979* natural do *Estado de São Paulo* e outorga-lhe o presente Diploma, a fim de que possa gozar de todos os direitos e prerrogativas legais.

São Bernardo do Campo, 21 de janeiro de 2008.

Prof. Maria Aparecida Fernandes Ribeiro
Secretária Acadêmica

Diplomado

Prof. Dr. Marcio de Moraes
Reitor

Scanned with CamScanner

UNIVERSIDADE METODISTA DE SÃO PAULO
FACULDADE DE CIÊNCIAS ADMINISTRATIVAS
CURSO DE ADMINISTRAÇÃO - BACHAREL
Reconhecimento Decreto nº 79.856 de 23/06/1977.
Diário Oficial da União de 24/06/1977

UNIVERSIDADE METODISTA DE SÃO PAULO
FACULDADE DE CIÊNCIAS ADMINISTRATIVAS

APOSTILA

O diplomado concluiu , nesta Faculdade, a Habilitação em:
COMÉRCIO EXTERIOR

São Bernardo do Campo, 21 de janeiro de 2008.

.....
Secretaria Acadêmica

UNIVERSIDADE METODISTA DE SÃO PAULO
Diploma registrado sob nº **15419**
Processo nº **15419/08** nos termos do artigo 48 § 1º, da Lei nº 9394/96.
São Bernardo do Campo, 21 de janeiro de 2008.

.....
Marcia Maciel
Seção de Registro de Diplomas

Visto: .....
Prof.ª Maria Aparecida Fernandes Ribeiro
Secretaria Acadêmica

Scanned with CamScanner

ACADEMIC TRANSCRIPT

Program:	BUSINESS ADMINISTRATION	Campus:	RUDGE RAMOS
License:	FOREIGN TRADE	Class schedule:	EVENING
Legal Act:	RECOGNIZED BY Decree No. 79,856 of 06/23/1977		
Published in the Federal Official Gazette on:		06/24/1977	

Academic Record No.:	43994		
Name:	LUCIANO APARECIDO DE SOUZA		
Place of Birth:	SÃO PAULO	Date of Birth:	08/15/1979
Nationality:	BRAZILIAN	CPF:	286.551.298-36
ID Number:	35.803.491-7	Issuing Authority:	SSPSP
Voter ID:		Electoral District/ Polling Station:	/
Military Discharge Number:		Series/RM/Category:	//
Presented Document:		Issued by:	

HIGH SCHOOL OR EQUIVALENT

Institution:	EFICAZ SCHOOL
City:	São Bernardo do Campo
Year of completion:	1998

ADMISSION PROCESS

Admission Method:	COMPETITIVE ENTRANCE EXAM	Year of Admission:	1999
Institution:	METHODIST UNIVERSITY OF SÃO PAULO		
Date of exam:	12/1998		
Total score:	29.0	Ranking:	282

GRADUATION

Degree awarded:	Bachelor's Degree in BUSINESS ADMINISTRATION	Graduation ceremony:	03/13/2003
Year of completion:	2002	Date of certificate issuance:	01/21/2008

NOTE

Until 1999, the passing grade average was seven, with a minimum of five after the final exam.
In 2000, the passing grade average was five.
As of 2001, the passing grade average was seven.
Took the National Course Examination on 06/09/2002.

São Bernardo do Campo, January 21, 2008

-----// signature //-----
Prof. Maria Aparecida Fernandes Ribeiro
Academic Secretary

Scanned with CamScanner

Methodist
University
of São Paulo

ACADEMIC TRANSCRIPT

Student: 043994 – LUCIANO APARECIDO DE SOUZA **Program:** 032 – BUSINESS ADMINISTRATION
CPF: 28655129836 **RG:** 35.803.491-7 **Curriculum:** 04 EVENING

Code	Course	Hours	Term	Year	Grade	Absences	Result
01094	GENERAL PHILOSOPHY I	36	01	1999/1	7.0	2	Passed
01336	FOREIGN TRADE SYSTEMS I	36	01	1999/1	8.5	0	Passed
01419	ACCOUNTING I	36	01	1999/1	8.0	0	Passed
01420	BASIC MATHEMATICS I	36	01	1999/1	7.0	1	Passed
01425	PHYSICAL EDUCATION I	36	01	-----	---	--	Exempt/CT
01867	FINANCIAL AND BUDGETARY ADMINISTRATION I	36	01	1999/1	8.0	0	Passed
01868	LAW I	36	01	1999/1	8.0	2	Passed
01869	ENGLISH I	36	01	1999/1	7.0	0	Passed
01870	INFORMATICS I	36	01	1999/1	9.5	2	Passed
01871	ADMINISTRATIVE THEORY I	36	01	1999/1	7.0	0	Passed
01872	SOCIOLOGY OF ORGANIZATIONS I	36	01	1999/1	10.0	0	Passed
01056	PHYSICAL EDUCATION II	36	02	-----	---	--	Exempt/CT
01096	GENERAL PHILOSOPHY II	36	02	1999/2	8.0	2	Passed
01334	FOREIGN TRADE SYSTEMS II	36	02	1999/2	8.0	4	Passed
01427	ACCOUNTING II	36	02	1999/2	7.0	2	Passed
01428	BASIC MATHEMATICS II	36	02	1999/2	7.0	2	Passed
02044	LAW II	36	02	1999/2	8.5	0	Passed
02045	ENGLISH II	36	02	1999/2	5.5	9	Passed
02046	INFORMATICS II	36	02	1999/2	6.0	8	Passed
02047	SOCIOLOGY OF ORGANIZATIONS II	36	02	1999/2	1.00	0	Passed
02048	ADMINISTRATIVE THEORY II	36	02	1999/2	8.0	8	Passed
02049	FINANCIAL AND BUDGETARY ADMINISTRATION II	36	02	1999/2	6.5	4	Passed
01333	FOREIGN TRADE SYSTEMS III	40	03	2000/1	5.0	2	Passed
01436	STATISTICS I	40	03	2000/1	7.5	5	Passed
02134	FINANCIAL AND BUDGETARY ADMINISTRATION III	80	03	2000/1	6.0	4	Passed
02135	PRODUCTION MANAGEMENT I	40	03	2000/1	6.0	2	Passed
02136	ENGLISH III	40	03	2000/1	5.5	0	Passed
02137	ORGANIZATIONAL PSYCHOLOGY I	40	03	2000/1	8.5	2	Passed
02138	ADMINISTRATIVE THEORY III	40	03	2000/1	5.0	2	Passed
02139	ECONOMICS I	40	03	2000/1	5.0	4	Passed
02140	LAW III	40	03	2000/1	6.5	4	Passed
01335	FOREIGN TRADE SYSTEMS IV	40	04	2000/2	5.5	10	Passed
01444	STATISTICS II	40	04	2000/2	5.5	6	Passed
02042	ECONOMICS II	40	04	2000/2	7.0	4	Passed
02241	ENGLISH IV	40	04	2000/2	6.0	8	Passed
02242	ORGANIZATIONAL PSYCHOLOGY II	40	04	2000/2	9.0	6	Passed
02243	ADMINISTRATIVE THEORY IV	40	04	2000/2	8.5	4	Passed
02244	LAW IV	40	04	2000/2	6.0	4	Passed
02240	PRODUCTION MANAGEMENT II	40	04	2002/1	7.5	8	Passed
02239	FINANCIAL AND BUDGETARY ADMINISTRATION IV	80	04	2002/2	7.5	0	Passed
01051	INTERNATIONAL ECONOMICS I	40	05	2001/1	8.0	6	Passed
01450	EXCHANGE THEORY AND PRACTICE I	80	05	2001/1	7.5	8	Passed
02245	ADMINISTRATIVE THEORY V	40	05	2001/1	7.0	4	Passed
02246	CUSTOMS AND TAX LEGISLATION I	40	05	2001/1	7.0	4	Passed
02247	ENGLISH V	40	05	2001/1	7.0	0	Passed
02248	MARKETING MANAGEMENT I	40	05	2001/1	7.5	2	Passed
02249	SPANISH I	40	05	2001/1	8.0	0	Passed
02250	INTERNATIONAL PHYSICAL DISTRIBUTION I	40	05	2001/1	7.0	8	Passed
02251	HUMAN RESOURCES MANAGEMENT I	40	05	2001/1	8.0	4	Passed
01046	INTERNATIONAL ECONOMICS II	40	06	2001/2	7.0	10	Passed
01458	EXCHANGE THEORY AND PRACTICE II	80	06	2001/2	7.0	20	Passed
02252	ADMINISTRATIVE THEORY VI	40	06	2001/2	7.5	4	Passed
02253	CUSTOMS AND TAX LEGISLATION II	40	06	2001/2	7.5	2	Passed
02254	ENGLISH VI	40	06	2001/2	7.0	0	Passed
02255	MARKETING MANAGEMENT II	40	06	2001/2	8.5	8	Passed

Notes **Page: 2/3** **Issue date:** 01/21/2008 -----// signature //-----

** Courses taken in another program.
* Courses taken under a different curriculum within the current program.

TECNOLOGY AND INFORMATION – FSGG040

Translator's Note: "Exempt/CT" stands for "Exempt/Credit Transfer".

Scanned with CamScanner

Methodist
University
of São Paulo

ACADEMIC TRANSCRIPT

Student: 043994 – LUCIANO APARECIDO DE SOUZA **Program:** 032 – BUSINESS ADMINISTRATION
CPF: 28655129836 **RG:** 35.803.491-7 **Curriculum:** 04 EVENING

Code	Course	Hours	Term	Year	Grade	Absences	Result
022556	SPANISH II	40	06	2001/2	7.5	0	Passed
02257	INTERNATIONAL PHYSICAL DISTRIBUTION II	40	06	2001/2	10.0	2	Passed
02258	HUMAN RESOURCES MANAGEMENT II	40	06	2001/2	7.5	2	Passed
01470	BRAZILIAN ECONOMY I	40	07	2002/1	8.5	4	Passed
01472	INTERNATIONAL LAW I	40	07	2002/1	7.5	8	Passed
02259	MARKETING MANAGEMENT III	40	07	2002/1	8.0	7	Passed
02260	ENGLISH VII	40	07	2002/1	7.0	2	Passed
02261	SPANISH III	40	07	2002/1	8.0	1	Passed
02262	INFORMATION SYSTEMS MANAGEMENT I	80	07	2002/1	7.0	10	Passed
02263	ORGANIZATION, SYSTEMS AND METHODS I	40	07	2002/1	9.0	7	Passed
02264	MATERIALS AND ASSETS MANAGEMENT I	80	07	2002/1	7.5	16	Passed
01479	BRAZILIAN ECONOMY II	40	08	2002/2	7.0	0	Passed
01481	INTERNATIONAL LAW II	40	08	2002/2	7.5	4	Passed
02265	MARKETING MANAGEMENT IV	40	08	2002/2	8.0	2	Passed
02266	ENGLISH VIII	40	08	2002/2	10.0	2	Passed
02267	SPANISH IV	40	08	2002/2	9.0	2	Passed
02268	INFORMATION SYSTEMS MANAGEMENT II	80	08	2002/2	8.5	6	Passed
02269	ORGANIZATION, SYSTEMS AND METHODS II	40	08	2002/2	8.5	3	Passed
02270	MATERIALS AND ASSETS MANAGEMENT II	80	08	2002/2	8.5	12	Passed
02271	MANDATORY SUPERVISED INTERNSHIP	300	08	2002/2	---	0	Completed
	TOTAL HOURS:	3420				-----// signature //-----	

TYPED BY: -----// signature //-----
VERIFIED BY: -----// signature //-----

TECNOLOGY AND INFORMATION – FSGG040

Notes **Page: 3/3** **Issue date:** 01/21/2008

** Courses taken in another program.
* Courses taken under a different curriculum within the current program.

Scanned with CamScanner

I, Raphael Michels Fantinato de Moura, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Raphael Michels Fantinato de Moura. **Date: November 11, 2025.**

Universidade Metodista de São Paulo

HISTÓRICO ESCOLAR

Curso:	ADMINISTRAÇÃO	Campus:	RUDGE RAMOS
Habilitação:	COMÉRCIO EXTERIOR	Turno:	NOITE
Ato Legal:	RECONHECIMENTO Decreto Nº 79.856 de 23/06/1977		
Publicação D.O.U.:	24/06/1977		

Registro Acadêmico:	43994		
Nome:	LUCIANO APARECIDO DE SOUZA		
Natural de:	SAO PAULO	Data de Nascimento:	15/08/1979
Nacionalidade:	BRASILEIRA	CPF:	286.551.298-36
Doc. de Identidade:	35.803.491-7	Órgão Emissor:	SSPSP
Título de Eleitor:		Zona/Seção:	/
Quitaçao Militar nº:		Série/RM/Categoria:	//
Doc. Apresentado:		Expedido por:	

ENSINO MÉDIO OU EQUIVALENTE

Estabelecimento:	COLÉGIO EFICAZ
Município:	São Bernardo do Campo
Ano de Conclusão:	1998

PROCESSO SELETIVO

Forma de Ingresso:	PROCESSO SELETIVO	Ano de Ingresso:	1999
Instituição:	UNIVERSIDADE METODISTA DE SÃO PAULO		
Realizado em:	12/1998		
Total de Pontos:	29.0	Classificação:	282

CONCLUSÃO

Título de:	Bacharel em ADMINISTRAÇÃO	Colação de Grau:	13/03/2003
Ano de Conclusão:	2002	Data da Expedição:	21/01/2008

OBSERVAÇÃO

Até 1999 média para aprovação sete,mediante exame final cinco.
Em 2000 média para aprovação cinco.
A partir de 2001 média para aprovação sete.
Realizou Exame Nacional de Cursos em 09/06/2002.

São Bernardo do Campo, 21 de janeiro de 2008

Profª. Maria Aparecida Fernandes Ribeiro
Secretária Acadêmica

Scanned with CamScanner

Universidade Metodista de São Paulo

HISTORICO ESCOLAR

Aluno: 043994 - LUCIANO APARECIDO DE SOUZA **Curso:** 032 - ADMINISTRACAO

CPF: 28655129836 **RG:** 35.803.491-7 **Currículo:** 04 NOTURNO

Código	Disciplina	Carga Hor.	Sem.	Ano	Nota	Falta	Resultado
01094	FILOSOFIA GERAL I	36	01	1999/1	7.0	2	Aprov.
01336	SISTEM. COM. EXT. I	36	01	1999/1	8.5	0	Aprov.
01419	CONTABILIDADE I	36	01	1999/1	8.0	0	Aprov.
01420	MATEMATICA BASICA I	36	01	1999/1	7.0	1	Aprov.
01425	EDUCACAO FISICA I	36	01	------	---	--	Disp/AE
01867	ADM.FINANCEIRA ORCAMENTARIA I	36	01	1999/1	8.0	0	Aprov.
01868	DIREITO I	36	01	1999/1	8.0	2	Aprov.
01869	INGLES I	36	01	1999/1	7.0	0	Aprov.
01870	INFORMATICA I	36	01	1999/1	9.5	2	Aprov.
01871	TEORIAS DA ADMINISTRACAO I	36	01	1999/1	7.0	0	Aprov.
01872	SOCIOLOGIA DAS ORGANIZACOES I	36	01	1999/1	10.0	0	Aprov.
01056	EDUC. FISICA II	36	02	------	---	--	Disp/AE
01096	FILOSOFIA GERAL II	36	02	1999/2	8.0	2	Aprov.
01334	SISTEM. COM. EXT. II	36	02	1999/2	8.0	4	Aprov.
01427	CONTABILIDADE II	36	02	1999/2	7.0	2	Aprov.
01428	MATEMATICA BASICA II	36	02	1999/2	7.0	2	Aprov.
02044	DIREITO II	36	02	1999/2	8.5	0	Aprov.
02045	INGLES II	36	02	1999/2	5.5	9	Aprov.
02046	INFORMATICA II	36	02	1999/2	6.0	8	Aprov.
02047	SOCIOLOGIA DAS ORGANIZACOES II	36	02	1999/2	10.0	0	Aprov.
02048	TEORIAS DA ADMINISTRACAO II	36	02	1999/2	8.0	8	Aprov.
02049	ADM.FINANCEIRA E ORCAMENT.II	36	02	1999/2	6.5	4	Aprov.
01333	SISTEM. COM. EXT. III	40	03	2000/1	5.0	2	Aprov.
01436	ESTATISTICA I	40	03	2000/1	7.5	5	Aprov.
02134	ADM.FINANCEIRA E ORCAMENT. III	80	03	2000/1	6.0	4	Aprov.
02135	ADMINISTRACAO DA PRODUCAO I	40	03	2000/1	6.0	2	Aprov.
02136	INGLES III	40	03	2000/1	5.5	0	Aprov.
02137	PSICOLOGIA DAS ORGANIZACOES I	40	03	2000/1	8.5	2	Aprov.
02138	TEORIAS DA ADMINISTRACAO III	40	03	2000/1	5.0	2	Aprov.
02139	ECONOMIA I	40	03	2000/1	5.0	4	Aprov.
02140	DIREITO III	40	03	2000/1	6.5	4	Aprov.
01335	SISTEM. COM. EXT. IV	40	04	2000/2	5.5	10	Aprov.
01444	ESTATISTICA II	40	04	2000/2	5.5	6	Aprov.
02042	ECONOMIA II	40	04	2000/2	7.0	4	Aprov.
02241	INGLES IV	40	04	2000/2	6.0	8	Aprov.
02242	PSICOLOGIA DAS ORGANIZACOES II	40	04	2000/2	9.0	6	Aprov.
02243	TEORIAS DA ADMINISTRACAO IV	40	04	2000/2	8.5	4	Aprov.
02244	DIREITO IV	40	04	2000/2	6.0	4	Aprov.
02240	ADMINISTRACAO DA PRODUCAO II	40	04	2002/1	7.5	8	Aprov.
02239	ADM.FINANCEIRA ORCAMENT.IV	80	04	2002/2	7.5	0	Aprov.
01051	ECONOMIA INTERNACIONAL I	40	05	2001/1	8.0	6	Aprov.
01450	TEORIA E PRATICA CAMBIAL I	80	05	2001/1	7.5	8	Aprov.
02245	TEORIAS DA ADMINISTRACAO V	40	05	2001/1	7.0	4	Aprov.
02246	LEGISLACAO ADUAN.TRIBUTARIA I	40	05	2001/1	7.0	4	Aprov.
02247	INGLES V	40	05	2001/1	7.0	0	Aprov.
02248	ADMINISTRACAO MERCADOLOGICA I	40	05	2001/1	7.5	2	Aprov.
02249	ESPANHOL I	40	05	2001/1	8.0	0	Aprov.
02250	DISTRIBUCAO FIS.INTERNAC. I	40	05	2001/1	7.0	8	Aprov.
02251	ADMINIST.RECURSOS HUMANOS I	40	05	2001/1	8.0	4	Aprov.
01046	ECONOMIA INTERNACIONAL II	40	06	2001/2	7.0	10	Aprov.
01458	TEORIA E PRATICA CAMBIAL II	80	06	2001/2	7.0	20	Aprov.
02252	TEORIAS DA ADMINISTRACAO VI	40	06	2001/2	7.5	4	Aprov.
02253	LEGISL.ADUANEIRA TRIBUTARIA II	40	06	2001/2	7.5	2	Aprov.
02254	INGLES VI	40	06	2001/2	7.0	0	Aprov.
02255	ADMINISTRACAO MERCADOLOGICA II	40	06	2001/2	8.5	8	Aprov.

Observações **Pág.:** 2/3 **Emissão:** 21/01/2008

** Disciplinas cursadas em outro curso.
* Disciplinas cursadas em outro curriculo no curso atual.

TECNOLOGIA E INFORMAÇÃO - FSG040

Scanned with CamScanner

Universidade Metodista de São Paulo

UMESP

HISTORICO ESCOLAR

Aluno: 043994 - LUCIANO APARECIDO DE SOUZA **Curso:** 032 - ADMINISTRACAO

CPF: 28655129836 **RG:** 35.803.491-7 **Currículo:** 04 NOTURNO

Código	Disciplina	Carga Hor.	Sem.	Ano	Nota	Falta	Resultado
02256	ESPANHOL II	40	06	2001/2	7.5	0	Aprov.
02257	DISTRIBUICAO FIS.INTERNAC. II	40	06	2001/2	10.0	2	Aprov.
02258	ADMINIST.RECURSOS HUMANOS II	40	06	2001/2	7.5	2	Aprov.
01470	ECONOMIA BRASILEIRA I	40	07	2002/1	8.5	4	Aprov.
01472	DIREITO INTERNACIONAL I	40	07	2002/1	7.5	8	Aprov.
02259	ADMINISTRACAO MERCADOLOGICAIII	40	07	2002/1	8.0	7	Aprov.
02260	INGLES VII	40	07	2002/1	7.0	2	Aprov.
02261	ESPANHOL III	40	07	2002/1	8.0	1	Aprov.
02262	ADMIN.SISTEMAS DE INFORMACAO I	80	07	2002/1	7.0	10	Aprov.
02263	ORGANIZACAO,SIST.E METODOS I	40	07	2002/1	9.0	7	Aprov.
02264	ADMIN.RECURSOS MAT.PATRIM. I	80	07	2002/1	7.5	16	Aprov.
01479	ECONOMIA BRASILEIRA II	40	08	2002/2	7.0	0	Aprov.
01481	DIREITO INTERNACIONAL II	40	08	2002/2	7.5	4	Aprov.
02265	ADMINISTRACAO MERCADOLOGICA IV	40	08	2002/2	8.0	2	Aprov.
02266	INGLES VIII	40	08	2002/2	10.0	2	Aprov.
02267	ESPANHOL IV	40	08	2002/2	9.0	2	Aprov.
02268	ADM.SISTEMAS DE INFORMACAO II	80	08	2002/2	8.5	6	Aprov.
02269	ORGANIZACAO,SIST.E METODOS II	40	08	2002/2	8.5	3	Aprov.
02270	ADM.RECURSOS MATER.PATRIMON.II	80	08	2002/2	8.5	12	Aprov.
02271	ESTAGIO OBRIG.SUPERVISIONADO	300	08	2002/2	---	0	Cumpriu
	TOTAL DA CARGA HORARIA :	3420					

DIGITADO POR: NEIDE

CONFERIDO POR:

Observações **Pág.:** 3/3 **Emissão:** 21/01/2008

** Disciplinas cursadas em outro curso.
* Disciplinas cursadas em outro currículo no curso atual.

SECRETARIA DE INFORMAÇÃO - FSG/UMESP

Scanned with CamScanner

GETULIO VARGAS
FOUNDATION

The Dean of the School of Graduate Studies in Economics and the Dean of the Brazilian School of Public and Business Administration of the Getulio Vargas Foundation hereby confer upon

LUCIANO APARECIDO DE SOUZA

this Certificate for the Graduate Program in
BUSINESS LOGISTICS,

Advanced Level, with a workload of 360 hours, held in Santos - SP, from March 15, 2003, to September 19, 2004.

Rio de Janeiro, July 18, 2008.

-----// signature //-----
Renato Fragelli Cardoso
Dean of the EPGE/FGV

-----// signature //-----
Bianor Scelza Cavalcanti
Dean of the EBAPE/FGV

I, Raphael Michels Fantinato de Moura, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Raphael Michels Fantinato de Moura. **Date: November 10, 2025.**

FUNDAÇÃO
GETULIO VARGAS

O Diretor da Escola de Pós-Graduação em Economia e o Diretor da Escola Brasileira de Administração Pública e de Empresas da Fundação Getulio Vargas conferem a

Luciano Aparecido de Souza

Certificado, do Curso de Pós-Graduação

Logística Empresarial

Nível Aperfeiçoamento, com 360 horas-aula, realizado em Santos - SP, no período de 15 de março de 2003 a 19 de setembro 2004.

Rio de Janeiro, 18 de julho de 2008.

Renato Fragelli Cardoso
Diretor da EPGE/FGV

Bianor Scelza Cavalcanti
Diretor da EBAPE/FGV

FGV GETULIO VARGAS FOUNDATION

ACADEMIC TRANSCRIPT

FGV management

Student name: Luciano Aparecido de Souza

Place of Birth: São Bernardo do Campo/SP | Date of Birth: 08/15/1979 | Program duration: 03/15/2003 to 09/19/2004

Program: Graduate Program in Business Logistics | Total class hours: 360 | Grade Point Average: 8.46

Course	Responsible Instructor	Degree	Class H.	Attendance	Final Grade
Fundamentals and Development of Business Logistics	Silvio Roberto Ignácio Pires	Doctorate in Mechanical Engineering / University of São Paulo	12h	100%	8.00
Competitive Strategies	Jamil Moyses Filho	Master's in Public Administration / Getulio Vargas Foundation	12h	100%	9.50
Marketing & Logistics	Francisco Pereira da Silva	Master's in Production Engineering / Federal University of Santa Catarina	12h	100%	10.00
Global Logistics	Mônica Romero Marinho	Master's in Education / University of Havana	24h	100%	9.70
Business Negotiation	Gersem Martins de Andrade	Master's in Petroleum Engineering / Leland Stanford Junior University	24h	75%	10.00
Introduction to Scientific Methodology	Fernando Saba Arbache	Master's in Production Engineering / Pontifical Catholic University of Rio de Janeiro	12h	100%	7.50
Financial Mathematics	Ana Tereza Schlaepfer Spinola	Master's in Public Administration / Getulio Vargas Foundation	12h	100%	8.90
Supplier Development and Material Acquisition	Antonio de Pádua Salmeron Ayres	Master's in Production Engineering / Methodist University of Piracicaba	24h	100%	8.70
Storage, Transport, and Distribution	Antonio de Pádua Salmeron Ayres	Master's in Production Engineering / Methodist University of Piracicaba	24h	100%	8.10
People Management in Competitive Environments	Carmelita Seno Cardeira Alves	Doctorate in Production Engineering / Federal University of Rio de Janeiro	12h	100%	8.00
Planning and Control of Production and Inventory	Geraldo Luiz de Almeida Pinto	Specialist in Total Quality Management / Getulio Vargas Foundation	24h	100%	8.80
Service Management	José Ferreira dos Santos	Specialist in Strategic Service Management / Regional Council of Administration – RJ	24h	100%	7.00
E-Business / E-Procurement	Carlos Fernandes Franco Junior	Doctorate in Administration / University of São Paulo	24h	75%	7.50
Integrated Business Management Systems	Marcelo Krieger	Master's in Electrical Engineering / Pontifical Catholic University of Rio de Janeiro	24h	100%	8.00
Logistics Costs	Fernando Faria Salgado	Master's in Ocean Engineering / Federal University of Rio de Janeiro	24h	100%	7.00
Logistics Project Planning, Control, and Evaluation	Jamil Moyses Filho	Master's in Public Administration / Getulio Vargas Foundation	24h	75%	8.80
Business Games	Daniel Angelo Silvestre	Master's in Management Systems / Fluminense Federal University	24h	100%	8.00
Investment Project Analysis	Iida Maria de Paiva Almeida Spritzer	Doctorate in Production Engineering / Federal University of Rio de Janeiro	24h	100%	8.80

CERTIFICATE NO. ***1579***

[program Stamp with signature]

[school Stamp with signature]

E- 037502

I, Raphael Michels Fantinato de Moura, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Raphael Michels Fantinato de Moura. **Date: November 10, 2025.**

FUNDAÇÃO GETULIO VARGAS

HISTÓRICO ESCOLAR

FGV management

Nome do aluno: Luciano Aparecido de Souza

Naturalidade: São Bernardo do Campo/SP | Data de nascimento: 15/08/1979 | Período: 15/03/2003 a19/09/2004

Curso: Pós-Graduação Logística Empresarial | Total de Horas-Aula: 360 | Coeficiente de Rendimento: 8,46

Disciplina	Docente Responsável	Titulação	H / A	Freqüência	Média Final
Fundamentos e Desenvolvimento da Logística Empresarial	Silvio Roberto Ignácio Pires	Doutor em Engenharia Mecânica / Universidade de São Paulo	12h	100%	8,00
Estratégias Competitivas	Jamil Moysés Filho	Mestre em Administração Pública / Fundação Getulio Vargas	12h	100%	9,50
Marketing & Logística	Francisco Pereira da Silva	Doutor em Engenharia de Produção / Universidade Federal de Santa Catarina	12h	100%	10,00
Logística Global	Mônica Romero Mannho	Mestre em Educação / Universidade de Havana	24h	100%	9,70
Negociação Empresarial	Gersem Martins de Andrade	Mestre em Engenharia de Petróleo / Leland Stanford Junior University	24h	75%	10,00
Introdução à Metodologia Científico	Fernando Saba Arbache	Mestre em Engenharia de Produção / Pontifícia Universidade Católica do Rio de Janeiro	12h	100%	7,50
Matemática Financeira	Ana Tereza Schlaepfer Spinola	Mestre em Administração Pública / Fundação Getulio Vargas	12h	100%	8,90
Desenvolvimento de Fornecedores e Aquisição de Material	Antonio de Pádua Salmeron Ayres	Mestre em Engenharia de Produção / Universidade Metodista de Piracicaba	24h	100%	8,70
Armazenagem, Transporte e Distribuição	Antonio de Pádua Salmeron Ayres	Mestre em Engenharia de Produção / Universidade Metodista de Piracicaba	24h	100%	8,10
Gestão de Pessoas em Ambientes Competitivos	Carmelita Seno Cardeira Alves	Doutor em Engenharia de Produção / Universidade Federal do Rio de Janeiro	12h	100%	8,00
Planejamento, Controle da Produção e Estoques	Geraldo Luiz de Almeida Pinto	Especialista em Gestão Pela Qualidade Total / Fundação Getulio Vargas	24h	100%	8,80
Gestão de Serviços	José Ferreira dos Santos	Especialista em Gestão Estratégica de Serviços / Conselho Regional de Administração - Rj	24h	100%	7,00
Negócios Eletrônicos/E-procurement	Carlos Fernandes Franco Junior	Doutor em Administração / Universidade de São Paulo	24h	75%	7,50
Sistemas Integrados de Gestão Empresarial	Marcelo Krieger	Mestre em Engenharia Elétrica / Pontifícia Universidade Católica do Rio de Janeiro	24h	100%	8,00
Custos Logísticos	Fernando Faria Salgado	Mestre em Engenharia Oceânica / Universidade Federal do Rio de Janeiro	24h	100%	7,00
Planejamento, Controle e Avaliação de Projetos Logísticos	Jamil Moysés Filho	Mestre em Administração Pública / Fundação Getulio Vargas	24h	75%	8,80
Jogos de Negócios (Business Game)	Daniel Angelo Silvestre	Mestre em Sistemas de Gestão / Universidade Federal Fluminense	24h	100%	8,00
Análise de Projetos de Investimentos	Ilda Maria de Paiva Almeida Spritzer	Doutor em Engenharia de Produção / Universidade Federal do Rio de Janeiro	24h	100%	8,80

CERTIFICADO Nº 1579

ESCOLA DE PÓS GRADUAÇÃO EM ECONOMIA SETOR ACADÊMICO FGV

ESCOLA BRASILEIRA DE ADMINISTRAÇÃO PÚBLICA E DE EMPRESAS SETOR ACADÊMICO F.G.V.

E- 037502

Carnegie Evaluations LLC
315 East High Street, Bound Brook, New Jersey, 08805
Email: info@carnegieevaluations.com
Website: www.carnegieevaluations.com
Phone: (848)300-0099
Fax: (848) 300-5199

EVALUATION OF ACADEMICS

Carnegie Evaluations LLC, who specializes in the evaluation of foreign educational credentials, has prepared the following academic credential evaluation.

November 24, 2025

Name: **Mr. Luciano Aparecido DE SOUZA**

Following is a description of Mr. De Souza's foreign degree:

Institution:	*Universidade Metodista de Sao Paulo*
Degree:	*Titulo de Bacharel em Administracao*
Date of Award:	March 2003
Years of Study:	Four
Country:	Brazil

Institution:	*Fundacao Getulio Vargas*
Degree:	*Curso de Pos-Graduacao Logistica Empresarial*
Date of Award:	September 2004
Years of Study:	One and a Half
Country:	Brazil

Academic Equivalency in the United States

BACHELOR OF BUSINESS ADMINISTRATION

ONE YEAR OF GRADUATE STUDY IN LOGISTICS

Carnegie Evaluations LLC, offers this evaluation, after reviewing copies of the original diploma certificates and transcripts provided. This evaluation is advisory in nature and is based on the assumption that the submitted documents are accurate. There are no apparent grounds to disbelieve the authenticity and accuracy of the documentation presented on behalf of Mr. Luciano Aparecido de Souza. In addition, this evaluation is based upon standard scholarly and professional sources as referenced at the end of this document. Carnegie Evaluations LLC, is not responsible for how this evaluation report will be used and is not responsible for damages resulting from such use of this report.

DISCUSSION OF MR. DE SOUZA'S ACADEMICS

This credential evaluation is provided upon review of the degree certificates and transcripts awarded to Mr. Luciano Aparecido de Souza during the course of his academic career. An analysis of Mr. De Souza's foreign educational courses for *Titulo de Bacharel em Administracao* (translated as Degree of Bachelor of Business Administration) from *Universidade Metodista de Sao Paulo* (translated as Methodist University of Sao Paulo) and *Curso de Pos-Graduacao Logistica Empresarial* (translated as Graduate Program in Business Logistics) from *Fundacao Getulio Vargas* (translated as Getulio Vargas Foundation) forms the basis for the following evaluation.

Mr. De Souza graduated with a Degree of Bachelor of Business Administration from Methodist University of Sao Paulo in March 2003. Methodist University of Sao Paulo is an accredited institution of higher education in Sao Bernardo do Campo, Brazil. Methodist University of Sao Paulo's Degree of Bachelor of Business Administration requires graduation from the US equivalent of high school and competitive entrance examinations for admission and enrollment. Mr. De Souza satisfactorily completed the academic course requirements required for a Degree of Bachelor of Business Administration. He majored in Business Administration and was awarded *Titulo de Bacharel em Administracao* from the institute.

This is a four-year undergraduate program of study that is equivalent to a Bachelor's degree from an accredited institution of higher education in the United States. The academic criterion maintained by Methodist University of Sao Paulo is significantly similar to those parameters upheld by any other accredited colleges and universities in the United States.

The *Titulo de Bacharel em Administracao* curriculum includes advanced bachelor's-level coursework and examinations in Foreign Trade Systems, Financial and Budgetary Administration, Administrative Theory, Informatics, Sociology of Organizations, Production Management, Organizational Psychology, Law, International Economics, Customs and Tax Legislation, Marketing Management, Human Resources Management, Information Systems Management, Organization, Systems and Methods, Materials and Assets Management, and other related subjects.

Thereafter, Mr. De Souza graduated with a Graduate Program in Business Logistics from Getulio Vargas Foundation in September 2004. Getulio Vargas Foundation is an accredited institution of higher education in Rio de Janeiro, Brazil. Getulio Vargas Foundation's Graduate Program in Business Logistics requires graduation from Bachelor level studies and competitive entrance examinations for admission and enrollment. Mr. De Souza satisfactorily completed the academic course requirements required for Graduate Program in Business Logistics. He majored in Business Logistics and was awarded *Curso de Pos-Graduacao Logistica Empresarial* from the institute.

This is a one and a half-year graduate program of study, which is substantially similar to the required coursework leading to completion of one year of Graduate-level studies from a regionally accredited University in the United States. The academic criterion maintained by Getulio Vargas Foundation is significantly similar to those parameters upheld by any other accredited colleges and universities in the United States.

The *Curso de Pos-Graduacao Logistica Empresarial* curriculum includes advanced graduate-level coursework and examinations in Fundamentals and Development of Business Logistics, Competitive Strategies, Marketing and Logistics, Global Logistics, Business Negotiation, Supplier Development and Material Acquisition, People Management in Competitive Environments, Planning and Control of Production and Inventory, Service Management, Logistics Costs, Business Games, Investment Project Analysis, and completed a thesis project.

Upon reviewing Mr. De Souza's academic history, it becomes apparent that Mr. De Souza has satisfied the coursework requirements, which are substantially similar and equivalent to those required for the completion of a four-year Bachelor's Degree and one year of graduate-level program at an accredited institution of higher education in the United States.

SUMMARY

On the basis of the academic reputations of Methodist University of Sao Paulo and Getulio Vargas Foundation, the nature and duration of the academic course work, and the grades attained in the courses, it is the judgment of Carnegie Evaluations LLC that Mr. De Souza has attained the equivalent of a Bachelor of Business Administration and one year of graduate study in Logistics from an accredited institution of higher education in the United States.

Carnegie Evaluations LLC represents this evaluation report to be an accurate and correct evaluation to the best of its knowledge and belief, pursuant to the requirements of the Citizenship and Immigration Services of the United States Department of Homeland Security. Carnegie Evaluations LLC does not represent that the documentation submitted to it by anyone for evaluation meets the evidentiary standards of any state or federal agency or any court. This evaluation report, as are all such reports provided by Carnegie Evaluations LLC, is advisory for the customer who requested it.

The foregoing evaluation of Mr. De Souza has been reviewed and approved by me, Dr. Zach G. Zacharia, on November 24, 2025.

Sincerely,



Zach G. Zacharia, Ph.D.
Director, Carnegie Evaluations LLC.
Associate Professor of Supply Chain Management
Director, Lehigh Center for Supply Chain Research
Lehigh University

Evaluation Resources:

1. World Higher Education Database. International Association of Universities' Worldwide Database of Higher Education Institutions, Systems and Credentials. www.whed.net.
2. AACRAO EDGE. AACRAO Electronic Database for Global Education. https://www.aacrao.org/edge
3. Central Intelligence Agency (CIA). The World Factbook. https://www.cia.gov/the-world-factbook/
4. ENIC-NARIC. European Network of Information Centres in the European Region, National Academic Recognition Information Centres in the European Union. www.enic-naric.net.

Bio: Professor Zach G. Zacharia

I am the Interim Department Chair, Decision and Technology Analytics (DATA) Department, an Associate Professor of Supply Chain Management, and Director of the Center for Supply Chain Research Lehigh in the College of Business and Economics, Lehigh University, where I teach Graduate and Undergraduate courses in Supply Chain Operations Management and Logistics and Transportation. In addition, I am also a visiting Professor at the Indian Institute of Technology (IIT) in New Delhi, India. I graduated with a B.S. in Mechanical Engineering from the University of Calgary, an MBA from the University of Alberta, and a Ph.D. in Logistics with a minor in Marketing from the University of Tennessee. My current research interests include Collaboration/Coopetition within the Supply Chain, Supplier Satisfaction, and the Physical Internet.

Before joining Academia, I worked at the University of Tennessee, Center for Transportation Research, for six years as an Associate Director. I also worked at the Department of Transportation in Alberta, Canada, for ten years as an Equipment Engineer. I am a principal in BZS Consulting, which primarily focuses on teaching Supply Chain Operations Management and evaluating collaboration and procurement strategies across firms in a supply chain.

I have developed significant international contacts and collaborations with many affiliate schools in several countries in Europe, Asia, and South America. I have evaluated numerous portfolios of international students from countries around the world and have performed in-depth assessments of how these foreign courses are equated to corresponding courses in the United States.

I have 29 refereed publications, including 2 articles in the Journal of Operations Management, 8 articles in the *Journal of Business Logistics,* and articles in *Decision Sciences*, the *Journal of Supply Chain Management, Industrial Marketing Management, International Journal of Production Research, International Journal of Production and Operations Management, International Journal of Logistics Management, Journal of Retailing, Journal of Business and Industrial Marketing, Marketing Management, Supply Chain Management Review, Journal of International Technology and Information Management*, *Journal of Vehicle Design* and *Wall Street Journal*. As a member of a Supply Chain Research Group at the University of Tennessee, I co-authored a book titled "*Supply Chain Management*" (Sage Publications, December 2000). I also contributed a chapter on logistics service providers and new product development in the book titled *Managing Innovation: The New Competitive Edge for Logistics Service Providers*, Stephan M. Wagner ed.**,** Kuehne Foundation Book Series (2007).

Among the awards that Dr. Zacharia has received is the DATA Department Service Award (2023), Staub Faculty Excellence Award (2013) for the College of Business, Lehigh University, Best Paper Finalist (2010) from the Journal of Operations Management, Best Paper Award (2007) from NARTS and Best Dissertation Proposal Award (2000) from University of Arkansas. As a member of a Supply Chain Research Group at the University of Tennessee, he coauthored a book titled Supply Chain Management (Sage Publications, December 2000).

A. Biographical Information

Zach G. Zacharia, Ph.D.
Interim Department Chair, Decision and Technology Analytics Department
Associate Professor Supply Chain Management
Director, Center for Supply Chain Management Lehigh
Supply Chain Management Program Director
Department of Management, College of Business Administration and Economics
Lehigh University, 621 Taylor Street, Bethlehem, PA, 18015
Office: (610) 758-4433, Fax: (610) 758-6941
zgz208@lehigh.edu

EDUCATION

1996 - 2001 **THE UNIVERSITY OF TENNESSEE** **Knoxville, TN**
Doctor of Philosophy in Business Administration

- Major: Logistics, Minor: Marketing
- Dissertation Title: An Analysis of the Effect of Logistics Involvement in Cross-functional Integrated New Product Development Projects (Advisor: Dr. John T. Mentzer)

1988 – 1993 **THE UNIVERSITY OF ALBERTA** **Edmonton, AB**
Master of Business Administration

1981 - 1985 **THE UNIVERSITY OF CALGARY** **Calgary, AB**
Bachelor of Science, Mechanical Engineering

1980 - 1981 **RED DEER COLLGE** **Red Deer, AB**
Bachelor of Science

1979 – 1980 **THE UNIVERSITY OF ALBERTA** **Edmonton, AB**
Bachelor of Science

WORK EXPERIENCE SUMMARY

2016 – Present, Director, Center for Supply Chain Research Lehigh
2013 – Present, Associate Professor – Lehigh University
2008 – 2013 Assistant Professor – Lehigh University
2001 – 2008 Assistant Professor - Texas Christian University
1999 – 2001 Associate Director – Transportation Center, University of Tennessee
1997 – 1999 Assistant Director - Transportation Center, University of Tennessee
1995 – 1997 Senior Research Associate – University of Tennessee
1989 – 1995 Research Engineer – R&D Branch, Alberta Transportation & Utilities
1985 – 1989 Equipment Engineer – Alberta Transportation & Utilities

CONSULTING PROJECTS, EXECUTIVE EDUCATION

2023 Ecofriendly Behavior on Personal Transportation, AFIT, Dalton
2020 Financial Flow in SC, DiCentral, Houston

2020	Expert Witness – Real Estate Company, Bethlehem
2020	Lehigh University, Executive Education, Bethlehem
2019	Lehigh University, Executive Education, Bethlehem
2019	SC Collaboration in Drop Ship, DiCentral, Houston
2018	Coopetition in the Defense Industry, AFIT, Dayton
2018	IIT New Delhi, Executive Education, Delhi, India
2017	Lehigh University, Executive Education, Bethlehem
2016	IIT Madras, Global Initiative of Academic Networks, Chennai, India
2015	Morrison Executive Education, Santo Domingo, Dominican Republic
2014	CSCMP Executive Seminar, Bogota, Columbia
2012	Supply Chain Management Simulation, WAM Systems, Philadelphia
2010	Supply Chain Management Overview, Universidad de Piura, Peru
2007	Procurement of Capability Guidelines, Lockheed Martin Aeronautics
2002	Truck Safety Recommendations, University of Tennessee

B. Publications and Creative Activities

EDITORIAL ROLES (6)

- Senior Associate Editor- *International Journal of Logistics Management (2018-current)*
- Senior Editor- *Journal of Business Logistics (2016- current)*
- Special Issue Editor-(Physical Internet) - *Journal of Business Logistics (2018-2020)*
- Special Issue Editor- (Inter-Disciplinary Research) *Journal of Business Logistics (2014-2015)*
- Editorial Board Member – *Journal of Operations Management*
- Editorial Board Member –*Transportation Journal*
- Editorial Board Member – *Journal of Supply Chain Management*

DISSERTATION COMMITTEE MEMBER (2)

- Michael Plasch - *Supply Chain Collaboration - Investigating Motives, Drivers And Success Factors* – Johannes Kepler University Linz, Austria, 2021
- Kimberly K. Whitehead – *It's A Matter Of Give And Take: Exploring The Role Of Knowledge Transfer Within Supply Chain Collaboration* - University of Texas at Arlington, USA, 2014

BOOK CHAPTERS (5)

- **Zacharia, Zach G**. "Is there a role for Logistics Service Providers in New Product Development?" *Managing Innovation: The New Competitive Edge for Logistics Service Providers*, Stephan M. Wagner ed., Kuehne Foundation Book Series. Ch 7, 2008.
- Mentzer, John T., William J. DeWitt, James S. Keebler, Soonhong Min, Nancy W. Nix, Carlo D. Smith, and **Zach G. Zacharia**, "What is Supply Chain Management" *Supply Chain Management*, Thousand Oaks, CA: Sage Publications, Ch.1, 2000.
- **Zacharia, Zach G**., "R&D and New Product Development in Supply Chain Management" *Supply Chain Management*, John T. Mentzer ed.**,** Thousand Oaks, CA: Sage Publications, Ch.6, 2000.
- **Zacharia, Zach G**., "The Evolution and Growth of Production in Supply Chain Management" *Supply Chain Management*, John T. Mentzer ed., Thousand Oaks, CA: Sage Publications, Ch.8, 2000.
- **Zacharia, Zach G**, "The Evolution and Growth of Information Systems in Supply Chain Management" *Supply Chain Management*, John T. Mentzer ed., Thousand Oaks, CA: Sage Publications, Ch.11, 2000.

REFEREED PUBLICATIONS (29)

29. Varun Jain, Usha Mohan, Zach G. Zacharia, Nada R. Sanders (2022) "Improving patient satisfaction and outpatient diagnostic center efficiency using novel online real-time scheduling" *Operations Research for Health Care,* 32, 1-17, 100338

28. Saif Mir, Misty Blessley, **Zach Zacharia**, John Aloysius (2022) "Mending Fences in the Buyer-Supplier Relationship: The Role of Justice in Relationship Restoration" *Journal of Supply Chain Management*. Vol. 58, No. 3, 23 – 46.

27. Dev, Navin; Ravi Shankar; **Zach Zacharia**, Sanjeev Swami, (2021) "Supply chain resilience for managing the ripple effect in Industry 4.0 for green product diffusion" *International Journal of Physical Distribution & Logistics Management* Vol. 51 No. 8, 897-930.

26. Ballot, Eric, Benoit Montreuil, **Zach G. Zacharia**, (2021) "Physical Internet: First Results and Next Challenges" *Journal of Business Logistics* Vol 42 No. 1, 1 – 7.

25. Treiblmaier, Horst, Kristijan Mirkovski, Paul B. Lowry, **Zach G. Zacharia**, (2020) "The Physical Internet as a New Supply Chain Paradigm: A Systematic

Literature Review and a Comprehensive Framework" *International Journal of Logistics Management* Vol. 31 No. 2, 239-287.

24. **Zach G. Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger (2019) "The Emerging Role of Coopetition Within Inter-Firm Relationships" *International Journal of Logistics Management* Vol. 30, No. 2, 414-437.

23. Soonhong Min, **Zach G. Zacharia**, Carlo D. Smith (2019) "Defining Supply Chain Management: In the Past, Present and Future" *Journal of Business Logistics* Vol. 40 No.1, 44-55.

22. Kimberly Whitehead, **Zach Zacharia**, Edmund Prater (2019) "Investigating the Role of Knowledge Transfer in Supply Chain Collaboration" *International Journal of Logistics Management"* Vol. 30, No. 1, 284-302.

21. Misty Blessly, Saif Mir, **Zach G. Zacharia**, John Aloysius (2018) "Breaching Relational Obligations In A Buyer-Supplier Relationship: Feelings Of Violation, Fairness Perceptions And Supplier Switching" *Industrial Marketing Management* Vol. 74, Oct, 215-226.

20. Faraz, Alireza, Nada R. Sanders, **Zach G. Zacharia**, Markus Gerschberger (2018) "Monitoring Type B Buyer-Supplier Relationships" *International Journal of Production Research* Vol. 56, No. 18, 6225-6239.

19. Whitehead, Kimberly, **Zach G. Zacharia**, Edmund Prater, (2016) "Absorptive Capacity Versus Distributive Capability: The Asymmetry of Knowledge Transfer" *International Journal of Operations and Production Management* Vol. 36, No 10, 1308-1332.

18. Nada R. Sanders, Brian R. Fugate, **Zach G. Zacharia**, (2016) "Interdisciplinary Research In SCM: Through the Lens of The Behavioral Theory of The Firm" *Journal of Business Logistics* Vol. 37, No 2, 107-112.

17. Nancy W. Nix, **Zach G. Zacharia,** (2014) "The Impact of Collaborative Engagement on Knowledge and Performance Gains in Episodic Collaborations" *International Journal of Logistics Management* Vol. 25, No 2, 245-269.

16. **Zach G. Zacharia,** Nada R. Sanders, Brian R. Fugate (2014) "The Evolving Role of Disciplines Within Supply Chain Management" *Journal of Supply Chain Management* Vol. 50, No 1, 73-88.

15. Nada R. Sanders, **Zach G. Zacharia**, Brian R. Fugate (2013) "The Interdisciplinary Future of Supply Chain Management Research" *Decision Sciences* Vol. 44, No. 3, 413-429.

14. Geoffrey T. Stewart, **Zach G. Zacharia,** Andrew B. Artis (2012) "Leveraging Relationship Orientation and its Impact on Relationship Outcomes" *Journal of Business and Industrial Marketing,* Vol. 27, No. 8, 644-658.

13. **Zach G. Zacharia,** Nancy W. Nix, Robert F. Lusch (2011) "Capabilities that Enhance Outcomes of an Episodic Supply Chain Collaboration" *Journal of Operations Management*, Vol. 29, No. 6, 591-603.

12. **Zach G. Zacharia,** Nada R. Sanders, Nancy W. Nix (2011) "The Emerging Role of the Third-Party Logistics Provider (3PL) as a Supply Chain Orchestrator" *Journal of Business Logistics*, Vol. 32, No. 1, 40-54.

11. Danny Lanier, Jr., William F. Wempe, **Zach G. Zacharia**, (2010) "Concentrated Supply Chain Membership and Financial Performance: Chain- and Firm-Level Perspectives" *Journal of Operations Management*, Vol.28, No.1, 1-16.

10. **Zach G. Zacharia**, Chad W. Autry, David S. Preston, Charles W. Lamb, (2009) "IT Alignment with Business Strategies in a Healthcare Organizations: An Empirical Analysis" *Journal of International Technology and Information Management*, Vol. 18, No. 3/4, 477-494.

9. **Zach G. Zacharia,** Nancy W. Nix and Robert F. Lusch, (2009) "An Analysis of Supply Chain Collaborations and Their Effect on Performance" *Journal of Business Logistics*, Vol. 30, No. 2, 101-123.

8. Chad W. Autry, **Zach G. Zacharia** and Charles W. Lamb, (2008) "A Logistics Strategy Taxonomy" *Journal of Business Logistics,* Vol. 29. No. 2, 53-74.

7. Nancy W. Nix, Robert F. Lusch, **Zach G. Zacharia**, and Wesley R. Bridges, (2008) "Competent Collaborations" *Marketing Management*, Vol. 17, No. 2, 18-24.

6. **Zach G. Zacharia** and John T. Mentzer (2007) "The Role of Logistics in New Product Development," *Journal of Business Logistics*, Vol. 28, No. 1, 83-110.

    a. Reprinted in:
    b. *Logistique and Management,* Vol. 16, No. 1, 35-53, (2008).

5. **Zach G. Zacharia** and John T. Mentzer (2004) "Logistics Salience In A Changing Environment," *Journal of Business Logistics*, Vol. 25, No. 1, 187-210.

    a. Reprinted in:
    b. *The ICFAI Journal of Supply Chain Management*, Vol. 3, No. 1, 53-72, (2006).

4. Mentzer, John T., William DeWitt, James S. Keebler, Soonhong Min, Nancy W. Nix, Carlo D. Smith, **Zach G. Zacharia** (2001) "Defining Supply Chain Management," *Journal of Business Logistics*, Vol. 22, No. 2, 1-25.

    c. Reprinted in:
    d. *Logistique and Management,* Vol. 9, No. 2, 3-19, (2001).

3. **Zacharia, Zach G**., John E. Tidwell and Stephen H. Richards (2001) "An Overview of Truck and Bus Safety:1999 Knoxville Symposium," *Journal of Vehicle Design*, Vol. 26, No. 4, 442-453.

2. Mentzer, John T., Min Soonhong and **Zach G. Zacharia** (2000) "The Nature of Interfirm Partnering in Supply Chain Management," *Journal of Retailing*, Winter, Vol. 76, Issue 4, 549-568.

1. **Zacharia, Zach G**. and Bart Jennings (1998) "The Use of Active Participation and Group Competition to Facilitate Training and Technology Transfer for Adult Learners," *Transportation Research Record,* No. 1637, 13-18.

PAPERS UNDER REVIEW (2)

- Zach G. Zacharia, Scott C. Ellis, Saif Mir, Robert J. Trent - "Gaining Advantage Through Social Exchange: How and Under What Conditions" (Revise and Resubmit)

- **Saif Mir, Timothy W. Breitbach, Zach G. Zacharia, Benjamin T. Hazen "Supplier Cultivation: An Accelerator Approach to Ecosystem Innovation" (Under Review)**

NON - REFEREED PUBLICATIONS (5)

5. **Zach G. Zacharia** (2020), What Every CFO Needs to Know about Supply Chains

4. **Zach G. Zacharia** (2019), Supply Chain Collaboration in Transformative Vertical Industries (Implications of Omnichannel and Drop Shipping)

3. Robert J. Trent, **Zach G. Zacharia,** (2012) "The Wisdom of Becoming a Preferred Customer," *Supply Chain Management Review* Vol. 16, No. 6, 10-18.

2. Nix, W. Nancy, Robert F. Lusch, **Zach G. Zacharia**, and Wesley R. Bridges, (2007) "The Hand That Feeds You – What Makes Some Collaborations with Suppliers Succeed – When So Many Fail?" *The Journal Report- Business Insight* (A Joint Venture with MIT *Sloan Management Review* and *Wall Street Journal*), Dow Jones and Company

1. **Zacharia, Zach G**. (1994) "Expert System Simplifies Bridge Paint Maintenance Programs," *Materials Performance,* June, 25 - 28.

CONFERENCE PROCEEDINGS (18)

18. **Zach Zacharia**, Timothy Breitbach, Ben Hazen, Saif Mir (2019) "Utilizing Accelerator Programs for adopting Innovations to Encourage the Adoption" *CSCMP Conference,* Anaheim, CA, September 15.
17. **Zach Zacharia**, Timothy Breitbach, Ben Hazen, Saif Mir (2018) "Utilizing Accelerator Programs to Encourage the Adoption of New Innovations in Large Organizations" *DSI Conference,* Chicago, IL, November 17.
16. Robert Weidmer, **Zach Zacharia**, (2018) "Competing Governance Mechanisms in Buyer-Supplier Relationships" *DSI Conference,* Chicago, IL, November 16.
15. **Zach Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger (2017) "The Role of Coopetition in Buyer Supplier Relationships" *DSI Conference,* Washington, DC, November 18.
14. **Zach Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger (2017) "Understanding the Antecedents and Outcomes of Coopetition" *CSCMP Academic Research Conference,* Atlanta, Georgia, September 24.
13. **Zach Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger (2017) "The Evolving Role of Coopetition within the Supply Chain" *CSCMP European Research Seminar,* Barcelona, Spain, May 19.
12. Gouda, Sirish, **Zach Zacharia**, Haritha Saranga (2016) "Linking New Forms of Work Organization and External Integration: Mediating role of cross functional collaboration" *DSI Conference,* Austin, Texas, November 21.
11. Blessley, Misty, Saif Mir, **Zacharia, Zach G.,** John Aloysius (2016) "The role of apologies following transgressions in buyer-supplier relationships." *CSCMP Educator Conference,* Orlando, Florida, September 25.
10. Blessley, Misty, Saif Mir, **Zacharia, Zach G.,** John Aloysius (2016) "The role of transactional and relational psychological contract breach in supplier switching behavior." *CSCMP European Research Seminar,* Vienna, Austria, May 13.
9. Blessley, Misty, Saif Mir, **Zacharia, Zach G.,** John Aloysius (2015) "Should I stay or should I go? The role of transactional and relational psychological contract breach in supplier switching behavior." *CSCMP Educator Conference,* San Diego, California, September 27.
8. **Zacharia, Zach G.,** Nancy W. Nix and Robert F. Lusch (2007) "Supply Chain Collaborations: Project Performance and Business Performance" *18th North American Teaching and Research Conference,* Tempe, Arizona, March 29-31.

7. **Zacharia, Zach G.** (2005) "Team Based Learning in MBA and Undergraduate Supply Chain Management Classes" *16th North American Teaching and Research Conference,* Tempe, Arizona, March 17-19.

6. Nix, Nancy W., **Zach G. Zacharia** and Robert F. Lusch (2005) "Keys to Effective Supply Chain Collaboration" *16th North American Teaching and Research Conference,* Tempe, Arizona, March 17-19.

5. **Zacharia, Zach G.** and Marc E. Ruzicka (2003) "Experiential Learning: Live Business Cases in MBA Supply Management and Logistics Classes" *14th North American Teaching and Research Conference,* Tempe, Arizona , March 21- 23.

4. **Zacharia**, **Zach G** (2000) "The Evolution and Growth of Production in the Supply Chain", *Society for Marketing Advances Conference*, Orlando, Florida, November 8-10.

3. **Zacharia, Zach G**., John E. Tidwell and Stephen H. Richards (2000) "An Overview of Truck and Bus Safety:1999 Knoxville Symposium," *4th International Fatigue Management Conference*, Perth, Australia, March 19-2.

2. **Zacharia, Zach G**. and Bart Jennings (1998), "The Use of Active Participation and Group Competition to Facilitate Training and Technology Transfer for Adult Learners," *Transportation Research Board Conference Proceedings,* Washington, District of Columbia, January 4-8.

1. **Zacharia, Zach G**. (1992), "Bridge Paint Expert Systems"*, Second International Organization for Economic Cooperation and Development (OECD) Conference on Knowledge Based Expert Systems in Transportation*, Montreal, Canada, April 3-7.

CONFERENCE PRESENTATIONS (3)

3. **Zach Zacharia**, (2022) "Identifying and Ranking Supply Chain Risks" *WDSI Conference,* Waikoloa, HI, April 7.

2. Annibal Sodero**, Zach Zacharia**, (2022) "Antecedents and outcomes of drop-shipping adoption in the retail supply chain" Euroama Conference, Berlin, July 3rd

1. Saif Mir**, Zach Zacharia**, (2022) "Risks in Procurement and Sourcing" DSI Conference Houston, November 21

PODCASTS (5)

- **Zacharia, Zach G**. (2021), "Red Flags in the Supply Chain" https://business.lehigh.edu/blog/2021/zach-zacharia-red-flags-supply-chain (July 2nd)

- **Zacharia, Zach G**. (2021), "Red Flags in the Supply Chain" https://business.lehigh.edu/blog/2021/zach-zacharia-red-flags-supply-chain (July 2nd)

- **Zacharia, Zach G**. (2021), "Disruptive New Paradigm of the Physical Internet" https://business.lehigh.edu/blog/2021/zach-zacharia-disruptive-new-paradigm-physical-internet (June 3rd)

- **Zacharia, Zach G**. (2018), "Dealing with Disruptive Innovations in the Supply Chain" (https://cbe.lehigh.edu/blog/posts/dealing-disruptive-innovations-supply-chain) (October 24)

- **Zacharia, Zach G**. (2017), "Drop Shipping: A New Opportunity for Retailers and Suppliers" (https://cbe.lehigh.edu/blog/posts/drop-shipping-new-opportunity-retailers-and-suppliers) December 11

- **Zacharia, Zach G**. (2017), "What You Need to Know About the Physical Internet" (https://cbe.lehigh.edu/blog/posts/what-you-need-know-about-physical-internet (March 14) (Ranked 4th in Google Search for Physical Internet)

WORKING PAPERS (6)

- Zach Zacharia, Michael Plasch, Markus Gerschberger "Explorative and exploitative motives for coopetition" *Target: International Journal of Production Economics*

- Zach Zacharia, Annibal Sodero "Drop Shipping and its Effects on the New E-Commerce Retail Paradigm" *Target: Journal of Operations Management"*

- Zach Zacharia, Robert Wiedmer, Kimberly Whitehead "Competing Governance Mechanisms in Buyer-Supplier Relationships" *Target: Journal of Operations Management*

- Zach Zacharia, Cedric Heuchenne, Nada Sanders, Faraz, Alireza "Comparison of populations based on binary characteristics in the presence of non-response" *Target: Production Operations Management Journal*

- Zach Zacharia, Gopal Kumar "Environmental and social performance leads to supply chain performance? An analysis in context of sustainable collaboration" *Target: Supply Chain Management: An International Journal*

- Zach Zacharia, Benjamin Hazen, Timothy Breitbach, Saif Mir "How Accelerator Programs Facilitate Innovation Adoption in Large Organizations" *Target: Journal of Operations Management*

27.Honors and Awards (25)

2023	DATA Department Service Award, Lehigh University
2018	Teaching Innovation Grant, CBE, Lehigh University
2018	Senior Associate Editor for *International Journal of Logistics Management*
2017	Best Reviewer Award *Journal of Business Logistics*
2016	Editor for *Journal of Business Logistics News*
2016	Associate Editor for *Production Operations Management* Special Issue
2015	Associate Editor for *Journal of Business Logistics*
2015	Member of the *Transportation Journal* Editorial Board
2013	Robert and Christine Staub Faculty Excellence Award
2012	Member of the *Journal of Supply Chain Management* Editorial Board
2011	Best Paper Finalist for 2010 (*Journal of Operations Management*)
2011	Best Paper Award (European DSI Conference)
2010-2011	Council of Supply Chain Management Professional Educator Conference Chair
2010	Member of the *Journal of Operations Management* Editorial Board
2010	Member of the *Journal of Business Logistics* Editorial Board
2009-2010	Supply Chain Management Educator Conference Proceedings Editor
2007-2008	Council of Supply Chain Management Case Editor
2007	Best Paper Award (*NARTS-ISM Conference*)
2006	Tied for highest SPOT (Student Perception of Teaching) score
2005	Highest SPOT (Student Perception of Teaching) in INSC department
2000	Doctoral Dissertation Proposal Award (*University of Arkansas)*
2000	Outstanding Student Paper Award *(Society for Marketing Advances)*
2000	Finalist *(ISBM Doctoral Dissertation Award)*
2000	Scholarly Research Grant Recipient *(University of Tennessee)*
1999, 1997	Fellow *(Council of Logistics Management Doctoral Symposium)*

28. Research Funding (16)

2019	DiCentral – SCM and Financial Flow Research $20,000
2019	Ben Franklin Technology Partners and ESPI $20,000
2018	AFIT – Managing Customer Driven Coopettittion Projects $25,000
2017	DiCentral – Drop Shipment Research $20,000
2014-2015	International Travel Grant - One of 5 recipients selected across the entire University $5000
2011	Faculty Research Grant – Lehigh University (Principal Investigator), Catherine Ridings (Lehigh University) " Does investment in Supply Chain Management and Information Technology provide value for micro firms?" $4500
2009	Summer Research Grant – College of Business and Economics, Lehigh University (Principal Investigator), Nada R. Sanders (Lehigh University, Brian S. Fugate (Colorado State University) *"State of Supply Chain Management: A Visionary Perspective"* $3000
2002-2007	Charles Tandy American Enterprise Center Faculty Research Award *(Texas Christian University)* ($10,000/yr)
2003, 05, 07	Junior Faculty Research Grant *(Institute of Supply Management)* ($750/yr)
2005	Research Center for Teaching Excellence, Faculty Fellow Grant *(Texas Christian University)* ($2500)

F. Scholarly Presentations (79)

- **Zacharia, Zach G.,** "*Supply Chain Collaboration in Transformative Vertical Industries"* Retail Value Chain Federation Conference, Teaneck, New Jersey, May 6, 2019

- **Zacharia, Zach G.,** "*Theoretical and Conceptual Foundations of Supply Chain Management"* PhD Research Seminar, Indian Institute of Technology, New Delhi, January India, January 25, 2018.

- **Zach Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger "*The Role of Coopetition in Buyer Supplier Relationships*" *DSI Conference,* Washington, DC, November 18, 2017

- **Zacharia, Zach G.,** "*Utilizing Drop Shipment to Improve Your Bottom Line"* Retail Value Chain Federation Conference, Phoenix, Arizona, November 6, 2017

- **Zach Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger "*Understanding the Antecedents and Outcomes of Coopetition*" *CSCMP Academic Research Conference,* Atlanta, Georgia, September 24, 2017

- **Zacharia, Zach G.,** "*Complexity in Supply Chain Management"* PhD Research Seminar, Atlanta, Georgia, September 23, 2017

- **Zacharia, Zach G.,** "*Coopetition Research"* PhD Research Seminar, Atlanta, September 22, 2017

- **Zacharia, Zach G.,** "*Buyer Supplier Relationships"* PhD Research Seminar, Atlanta, September 21, 2017

- **Zacharia, Zach G.,** "*Publishing Research in American Supply Chain Journals"* Indian Institute of Technology, New Delhi, India, July 21, 2017.

- **Zacharia, Zach G.,** "*Transforming Traditional Networks Through the Use of Collaborative Environments"* Supply Chain Leaders in Action Conference, Naples, Florida June 5, 2017

- **Zach Zacharia**, Michael Plasch, Usha Mohan, Markus Gerschberger (2017) "*The Evolving Role of Coopetition within the Supply Chain*" CSCMP European Research Seminar*,* Barcelona, Spain, May 19.

- **Zacharia, Zach G.,** "*Logistics PhD programs in the US panel session"* Logistics Doctoral Symposium, Auburn University, Auburn, February 24, 2017.

- **Zacharia, Zach G.,** "*A Research Journey"* Indian Institute of Technology, Trichy, India, February 6, 2017.

- **Zacharia, Zach G.,** "*Orientation and Firm Infrastructure"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria January 12, 2017

- **Zacharia, Zach G.,** "*Strategy"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria January 11, 2017

- **Zacharia, Zach G.,** "*Conceptual Foundations from Procurement and Operations"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria January 10, 2017

- **Zacharia, Zach G.,** "*Conceptual Foundations from Marketing and Logistics"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria January 9, 2017

- **Zacharia, Zach G.,** "*Theoretical and Conceptual Foundations of Supply Chain Management"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria August 10, 2016

- **Zacharia, Zach G.,** "*Philosophy of Science"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria August 9, 2016

- **Zacharia, Zach G.,** " *Conceptual Foundations of Marketing"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria August 8, 2016

- **Zacharia, Zach G.,** " *Conceptual Foundations of Operations"* PhD Research Seminar, Logistikum, University of Applied Sciences, Steyr, Austria August 10, 2016

- Gouda, Sirish, **Zach Zacharia**, Haritha Saranga (2016) "Linking New Forms of Work Organization and External Integration: Mediating role of cross functional collaboration" *DSI Conference,* Austin, Texas, November 21.

- Blessley, Misty, Saif Mir, **Zacharia, Zach G.,** John Aloysius (2016) "The role of apologies following transgressions in buyer-supplier relationships." *CSCMP Educator Conference,* Orlando, Florida, September 25.

- **Zacharia, Zach G.,** " *Increasing Efficiency and Reducing Cost within a Supply Chain"* Indian Institute of Technology, Madras, India, June 13 2016.

- Blessley, Misty, Saif Mir, **Zacharia, Zach G.,** John Aloysius (2016) "The role of transactional and relational psychological contract breach in supplier switching behavior." *CSCMP European Research Seminar,* Vienna, Austria, May 13.

- Bleasley, Misty, Mir, Saif, **Zacharia, Zach G.,** Aloysius, John " *Should I stay or should I go? The role of transactional and relational psychological contract breach in supplier switching behavior"* Council of Supply Chain Management Educator Conference, San Diego, September 27, 2015.

- **Zacharia, Zach G.,** "*Qualitative and Quantitative Research Paths in SCM"* , University of Arkansas, Fayetteville, Arkansas Feb 27, 2015.

- **Zacharia, Zach G.,** "*Publishing Research in American Supply Chain Journals"* Indian Institute of Management, Bangalore, India, January 13, 2015.

- **Zacharia, Zach G.,** Scott Ellis, Robert J. Trent "*Gaining Advantage Through Social Exchange: How and Under What Conditions"* Production Operation Management Conference, Atlanta, Georgia, May 10, 2014.

- Ellis, Scott, **Zacharia, Zach G.,** Jae-Young Oh "*The Role of Functional Congruence in Cross-Functional and Inter-organizational Collaboration"* Decision Sciences Institute Conference, Baltimore, Maryland, November 19, 2013.

- **Zacharia, Zach G.,** "*Supply Chain Management, Collaboration and their Role Across Businesses and People"* Congress of Latin American Engineering Students, Lima, Peru, October 29, 2013.

- **Zacharia, Zach G.,** Scott Ellis, "*Antecedents to Buyer-Engineer Knowledge Transfer"* Production Operation Management Conference, Denver, Colorado, May 4, 2013.

- **Zacharia, Zach G.,** "*Balancing Effective Research and Teaching"* – Invited Panel Presentation, Council of Supply Chain Management Doctoral Symposium, Atlanta, Georgia, October 1, 2012.

- **Zacharia, Zach G.,** "*What are some of the Factors That Affect the Relationship Between Cross Functional New Product Development and New Product Project Performance?"* Decision Sciences Institute Conference, Boston, Massachusetts, November 22, 2011.

- **Zacharia, Zach G.,** "*Supply Chain Security - An Academic Discussion and Future Research"* Invited Panel Presentation, Decision Sciences Institute Conference, Boston, Massachusetts, November 21, 2011.

- **Zacharia, Zach G.,** "*Conference Chairperson Opening Remarks"* Council of Supply Chain Management Educator Conference, Philadelphia, Pennsylvania, October 2, 2011.

- **Zacharia, Zach G.,** William F. Wempe William and Danny Lanier, Jr. "*Concentrated Supply Chain Membership and Financial Performance: Chain- and Firm-Level Perspectives"* Academy of Management Conference, San Antonio, Texas, August 12 – August 17, 2011.

- **Zacharia, Zach G.** and Catherine M. Ridings *"Does investment in Supply Chain Management and Information Technology provide value for micro firms?"* Production Operations Management Conference, Reno, Nevada, April 28-May 1, 2011.

- **Zacharia, Zach G.** and Robert J. Trent *"Supplier Satisfaction and Innovation Sharing"* Decision Sciences Institute Conference, San Diego, November 20-23, 2010.

- Christoph Bode, Stephan M. Wagner and **Zacharia, Zach G.,** "*The Effect of Cooperation, Supplier Development, and Relationship-Specific Investments on Suppliers' Willingness to Share Innovation"* Decision Sciences Institute Conference, San Diego, November 20-23, 2010.

- **Zacharia, Zach G.** *"Personal Career Development in Academia: What now and How"* Council of Supply Chain Management Professionals Doctoral Symposium, San Diego, September 27, 2010.

- **Zacharia, Zach G.** *"Supply Chain Management Overview"* Executive MBA Program, Universidad de Piura, Piura, Peru, June 12, 2010.

- **Zacharia, Zach G.** *"Supply Chain Management Collaboration Strategies"* CSCMP Roundtable, Lima, Peru, June 11, 2010.

- **Zacharia, Zach G.** and John R. MacDonald *"Are differences in Risk Planning Significant?"* Production and Operations Management Conference, Vancouver, Canada, May 7-10, 2010.

- **Zacharia, Zach G.** and Robert J. Trent *"Supplier Satisfaction – How does it matter?"* Production and Operations Management Conference, Vancouver, Canada, May 7-10, 2010.

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"The Moderating Role of Absorptive Capability and Collaborative Communication in Organizational Learning"* 19th *North American Teaching and Research Conference,* Tempe, Arizona, March 11-12, 2010

- **Zacharia, Zach G.** and John R. MacDonald *"Risk Planning: Is it of Value"* Decision Sciences Institute Conference, New Orleans, LA, November 17, 2009.

- **Zacharia, Zach G.** *"When Should New Product Development Managers Consider Distribution Logistics"* Decision Sciences Institute Conference, New Orleans, LA, November 15, 2009.

- John R. MacDonald and **Zacharia, Zach G.** *"Risk and Disruption Management: The Impact of Behavioral Interference"* Behavioral Operations Conference, Syracuse, NY, June 26, 2009.

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"The Moderating Role of Absorptive Capability and Collaborative Communication in Organizational Learning"* Production and Operation Management Conference, Orlando, FL, May 2, 2009.

- **Zacharia, Zach G.,** Nancy W. Nix and Robert F. Lusch "Supply Chain Collaborations: Project Performance and Business Performance" *18th North American Teaching and Research Conference,* Tempe, Arizona, March 29-31. (2007)

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"The Moderating Role of Absorptive Capability and Collaborative Communication in Organizational Learning"* University of Tennessee, Knoxville, TN, November 7, 2006.

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"The Moderating Role of Absorptive Capability and Collaborative Communication in Knowledge Acquisition"* DFWCSMP Roundtable meeting, Dallas, TX, October 12, 2006.

- **Zacharia, Zach G.,** *"Early Supplier Involvement"* National Council for Advanced Manufacturing, Washington, MD, June 7, 2006.

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"Keys to Effective Supply Chain Collaboration and Knowledge Acquisition"* National Council for Advanced Manufacturing, Washington, MD, June 7, 2006.

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"Keys to Effective Supply Chain Collaboration"* Supplier Network Working Group Meeting, Fort Worth, TX March 16, 2006.

- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"Keys to Effective Supply Chain Collaboration"* Institute of Supply Management Group Meeting, Fort Worth, Texas, January 3, 2006.

- **Zacharia, Zach G.** "Team Based Learning in MBA and Undergraduate Supply Chain Management Classes" *16th North American Teaching and Research Conference,* Tempe, Arizona, March 17-19. (2005)

- Nix, Nancy W., **Zach G. Zacharia** and Robert F. Lusch "Keys to Effective Supply Chain Collaboration" *16th North American Teaching and Research Conference,* Tempe, Arizona, March 17-19. (2005)

- **Zacharia, Zach G.,** *"Education Strategies"* Council of Logistics Roundtable Leadership Forum, Chicago, Illinois, June 11-12, 2004.
- **Zacharia, Zach G.,** and Nancy W. Nix, *"Supply Chain Collaboration – The role of a 3PL intermediary"* Society of Marketing Advances, New Orleans, Louisiana, November 6 - 8, 2003.
- **Zacharia, Zach G.,** Nancy W. Nix, and Robert F. Lusch *"Collaboration Effectiveness in the Supply Chain: A Knowledge and Capabilities Based Approach"* American Marketing Faculty Consortium, Dallas, Texas, October 30-November 2, 2003.

- **Zacharia, Zach G.,** *"What does it mean to be an education officer in your roundtable?"* Council of Logistics Roundtable Leadership Forum, Chicago, Illinois, June 6-7, 2003.

- Nix, Nancy W. and **Zach G. Zacharia**, Track Chairs "*Going Beyond the Hype: Getting and Measuring the Value from your Supply Chain Initiatives"* Council of Logistics Management Conference, Chicago, Illinois, September 23-27, 2003.
- **Zach G. Zacharia,** *Top 10 Truck Safety Recommendations*, Federal Motor Carrier Safety Administration, Washington, District of Columbia, October 16, 2002.
- **Zach G. Zacharia,** *Logistics Involvement in New Product Development*, University of Arkansas, Fayetteville, Arkansas, September 18, 2002.
- **Zach G. Zacharia,** "Supply and Value Chain Certificate Program" presented at the Supply and Value Chain Conference, Ft. Worth, Texas, February 8, 2002.
- **Zach G. Zacharia,** "*Tennessee Transportation Assistance Program*" presented at the Region 4 LTAP conference, St. Petersburg, Florida, May 16, 2001.
- **Zach G. Zacharia,** "*The Evolution and Growth of Production in the Supply Chain*", *2000 Society for Marketing Advances Conference*, Orlando, Florida, November 8. 2000.
- **Zach G. Zacharia,** and Soonhong Min "*The Nature of Interfirm Partnering in Supply Chain Management*" presented at American Marketing Association, Chicago, Illinois, August 5, 2000.
- **Zach G. Zacharia,** *"Searching the Internet and Web Page Design"* presented at University of Tennessee, Knoxville, Tennessee, April 17, 2000.
- **Zach G. Zacharia,** *"An Overview of Truck and Bus Safety: 1999 Knoxville Symposium* presented at the 4th International Fatigue Management Conference, Perth, Australia, March 19 – 22, 2000.
- **Zach G. Zacharia,** "*Traffic Safety and the Internet*" presented at the Governor Highway Safety Conference, Memphis, Tennessee, July 12-14, 1999.
- **Zach G. Zacharia,** "*Tennessee Transportation Assistance Program*" presented at the Asphalt Emulsion Users Conference, Nashville, Tennessee, November 19, 1998.
- **Zach G. Zacharia** and Barton R. Jennings "*The Use of Active Participation and Group Competition to Facilitate Training and Technology Transfer for Adult Learners*" Transportation Research Board Conference, Washington, District of Columbia, January 10-14, 1998.
- **Zach G. Zacharia,** "*Training Requirements for Local Governments*" presented at the National Transportation Training Conference, Reno, Nevada, October 7-9, 1997.
- **Zach G. Zacharia,** "*Logistics Thought: Key Messages and Implications from the Field of Marketing*," presented at the Council of Logistics Management Doctoral Symposium, Chicago, Illinois, October 3-4, 1997.

- **Zach G. Zacharia,** "*Navigating the Internet*" presented at the Southeast Local Roads Conference, Biloxi, Mississippi, September 24-26, 1997.
- **Zach G. Zacharia,** "*Bridge Paint Expert Systems,"* presented at the Second International Organization for Economic Cooperation and Development (OECD) Conference on Knowledge Based Expert Systems in Transportation, Montreal, Canada, June 14-16, 1992.

G. Teaching and Research Advising

COURSES:

Lehigh University (2008 – Present)

- SCM 186 - Supply Chain Management and Operations (Undergraduate 2008 - present)
- SCM 354 - Logistics and Transportation (Undergraduate 2008-present)
- GBUS 453 – Logistics and Transportation (Graduate 2013 – present)
- GBUS 492- Supply Chain Management Strategy (Graduate 2010- 2015) (Summer Course)
- Advising 14 Supply Chain Management Majors (2021)
- Advising 11 Supply Chain Management Majors (2020)
- Advising 21 Supply Chain Management Majors (2019)
- Advising 5 Supply Chain Management Majors (2018)
- Advising 24 Supply Chain Management Majors (2017)
- Advising 9 Supply Chain Management Majors (2016)
- Advising 27 Supply Chain Management Majors (2015)
- Advising 28 Supply Chain Management Majors (2014)
- Advising 24 Supply Chain Management Majors (2013)
- Advising 9 Supply Chain Management Majors (2012)
- Advising 10 Supply Chain Management Majors (2011)
- Advising 13 Supply Chain Management Majors (2010)
- Advising 6 Supply Chain Management Majors (2009)

Texas Christian University (2001 – 2008)

- Strategic Sourcing and Procurement (Professional MBA) 2007
- Business Simulation (Professional MBA) 2007
- Supply Chain Management Concepts (Full-Time MBA) 2005 – 2008
- Supply Chain Management Concepts (Professional MBA) 2001– 2008
- Logistics and Transportation (Professional MBA) 2001 - 2008
- Supply Chain Tools and Technologies (Professional MBA) 2002
- Logistics and Transportation (Undergraduate) 2001 - 2008
- Supply Chain Management Concepts (Undergraduate) 2003 – 2004
- Supply Chain Tools and Technologies (Undergraduate) 2003
- Procurement and Supply Management (Undergraduate) 2003

University of Tennessee (1996-2001)

- Introduction to Transportation (Undergraduate) Summer 1998
- Introduction to Logistics (Undergraduate) Summer 1999
- Marketing Management (Undergraduate) Spring 2000
- Global Logistics and Transportation (Undergraduate) Summer 2000

H. SERVICE

University

Faculty Compensation Committee (2016 – 2019)

College

Director, Center for Supply Chain Research Lehigh
Promotion and Tenure Committee (2021 – onwards)
Chair, Database and Software Committee (2018 – onwards)
Ph.D. Task Force (2017)
Undergraduate Core Curriculum Committee (2016)
Math Committee to Assess Assessment Results (2010)

Department

BIS Assistant Professor Search Chair – Tenure Track (2021-2021)
SCM Assistant Professor Search Chair – Tenure Track (2020-2020)
DATA Department Chair Search – Tenure Track (2019-2019)
SCM Assistant Professor Search Chair – Tenure Track (2018-2018)
SCM POP Search Chair (2017-2017)
Research Seminar Committee (2010-2011)
SCM Club Faculty Liaison (2009-2019)

Professional (Council of Supply Chain Management Professionals)

Education Committee Member -Lehigh Valley Roundtable (2015-onwards)
President – Lehigh Valley Roundtable (2012-2015)
Education Conference Chair (2010 – 2011)
Education Strategies Committee Member (2007 – 3-year term)
Case Editor (3-year term)
President – Dallas Roundtable (2007-2008)
Vice President – Dallas Roundtable (2006-2007)
Education chair – Dallas Roundtable (2004-2006)
Member (1999 – onwards)

External Service

Rockefeller Group – Expert Service Consulting (Jan 2020)

Exhibit B - Professional Experience and Business Activity:

E-IT Services Consultoria de Informatica Ltda
Avenida Paes de Barros, 3333 – 1st Floor
São Paulo – SP l 03149-100

Revenue Statement

São Paulo, October 9, 2025

We hereby declare, for all appropriate purposes, that the company E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., registered under CNPJ No. 31.412.442/0001-79, reported the following gross revenues for the periods indicated below.

Year	Total
2018	R$ 191,878.00
2019	R$ 674,702.70
2020	R$ 526,961.76
2021	R$ 671,223.42
2022	R$ 749,671.86
2023	R$ 460,032.98
2024	R$ 529,890.93
2025	R$ 598,844.90
Total	**R$ 4,403,206.14**

LUCIANO APARECIDO DESOUZA: 28655129836

Digitally signed by LUCIANO APARECIDO DE SOUZA: 28655129836
Date: 2025.10.21 5:33:30 PM-03'00'

E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA
CNPJ 31.412.442/0001-79

DIGITALLY SIGNED
DOMINGOS ORESTES CHIOMENTO
Signature validity can be verified at:
https://serpro.gov.br/assinador-digital
Serpro

DOC CONTABILIDADE EMPRESARIAL S/S
DOMINGO ORESTES CHIOMENTO
CRC/SP: 1SP032010-0-0

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

Date: July 9, 2026

E-IT Services Consultoria de Informatica Ltda
Avenida Paes de Barros, 3333 – 1 Andar
São Paulo – SP l 03149-100

Declaração de Faturamento

São Paulo, 09 de Outubro de 2025.

Declaramos para os devidos fins, que a empresa E-IT Services Consultoria de Informática Ltda, inscrita no CNPJ 31.412.442/0001-79, apresentou os faturamentos brutos abaixo, compreendendo os períodos abaixo indicados.

Ano	Total
2018	R$ 191.878,00
2019	R$ 674.702,70
2020	R$ 526.961,76
2021	R$ 671.223,42
2022	R$ 749.671,86
2023	R$ 460.032,98
2024	R$ 529.890,93
2025	R$ 598.844,90
Total	**R$ 4.403.206,14**

LUCIANO APARECIDO DESOUZA:28655129836

Assinado de forma digital por LUCIANO APARECIDO DE SOUZA:28655129836
Dados:2025.10.2117:33:30-03'00'

E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA
CNPJ 31.412.442/0001-79

ASSINADO DIGITALMENTE
DOMINGOS ORESTES CHIOMENTO
A conformidade com a assinatura pode ser verificada em:
https://serpro.gov.br/assinador-digital
Serpro

DOC CONTABILIDADE EMPRESARIAL S/S
DOMINGO ORESTES CHIOMENTO
CRC/SP: 1SP032010-0-0

Revenue Statement

São Paulo, October 9, 2025

We hereby declare, for all appropriate purposes, that the company E-IT Technologies Consultoria de Informatica Ltda, registered under CNPJ No. 12.349.468/000175, reported the following gross revenues for the periods indicated below.

Year	Amounts
2014	R$ 3,952,896.89
2015	R$ 5,898,679.32
2016	R$ 8,724,575.99
2017	R$ 9,856,866.58
2018	R$ 9,026,891.50
2019	R$ 12,064,524.27
2020	R$ 10,113,553.13
2021	R$ 8,186,045.97
2022	R$ 12,738,071.08
2023	R$ 14,432,727.92
2024	R$ 12,784,561.59
2025	R$ 10,590,436.33
Total	**R$ 118,369,830.57**

LUCIANO APARECIDO DE SOUZA: 28655129836

Digitally signed by LUCIANO APARECIDO DE SOUZA: 28655129836
Date: 2025.10.21 5:37:04 PM-03'00'

E-ITTECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA
CNPJ 12.349.468/0001-75

DIGITALLY SIGNED
DOMINGOS ORESTES CHIOMENTO
Signature validity can be verified at:
https://serpro.gov.br/assinador-digital
Serpro

DOC CONTABILIDADE EMPRESARIAL S/S
CNPJ 63.033.328/0001-24
DOMINGOS ORESTES CHIOMENTO
CRC/SP: 1SP032010-0

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

Date: July 9, 2026

Declaração de Faturamento

São Paulo, 09 de Outubro de 2025.

Declaramos para os devidos fins, que a empresa E-IT Technologies Consultoria de Informatica Ltda, inscrita no CNPJ 12.349.468/000175, apresentou os faturamentos brutos abaixo, compreendendo os períodos abaixo indicados.

Ano	Valores
2014	R$ 3.952.896,89
2015	R$ 5.898.679,32
2016	R$ 8.724.575,99
2017	R$ 9.856.866,58
2018	R$ 9.026.891,50
2019	R$ 12.064.524,27
2020	R$ 10.113.553,13
2021	R$ 8.186.045,97
2022	R$ 12.738.071,08
2023	R$ 14.432.727,92
2024	R$ 12.784.561,59
2025	R$ 10.590.436,33
Total	R$ 118.369.830,57

LUCIANO APARECIDO DE SOUZA: 28655129836

Assinado de forma digital por LUCIANO APARECIDO DE SOUZA: 28655129836
Dados: 2025.10.21 17:37:04-03'00'

E-ITTECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA
CNPJ 12.349.468/0001-75

ASSINADO DIGITALMENTE
DOMINGOS ORESTES CHIOMENTO
A conformidade com a assinatura pode ser verificada em:
https://serpro.gov.br/assinador-digital
Serpro

DOC CONTABILIDADE EMPRESARIAL S/S
CNPJ 63.033.328/0001-24
DOMINGOS ORESTES CHIOMENTO
CRC/SP: 1SP032010-0

FEDERATIVE REPUBLIC OF BRAZIL

NATIONAL REGISTER OF LEGAL ENTITIES

REGISTRATION NUMBER **12.349.468/0001-75** **HEAD OFFICE**	**CERTIFICATE OF ENROLLMENT AND REGISTRATION STATUS**	DATE OF INCORPORATION **07/22/2010**

COMPANY NAME
E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA

TRADE NAME (DBA) **********	SIZE **OTHERS**

CODE AND DESCRIPTION OF MAIN ECONOMIC ACTIVITY
62.04-0-00 – Information Technology Consulting

CODE AND DESCRIPTION OF SECONDARY ECONOMIC ACTIVITIES
62.02-3-00 – Development and Licensing of Customizable Computer Software
62.03-1-00 – Development and Licensing of Non-Customizable Computer Software

CODE AND DESCRIPTION OF LEGAL NATURE
206-2 - Limited Liability Company

ADDRESS **AV PAES DE BARROS**	NUMBER **3333**	UNIT **HOUSE**

ZIP CODE **03.149-100**	NEIGHBORHOOD/DISTRICT **PARQUE DA MOOCA**	CITY **SAO PAULO**	STATE **SP**

EMAIL ADDRESS **FISCAL@E-IT.NET**	PHONE NUMBER **(11) 3774-5740/ (11) 4654-5580**

RESPONSIBLE FEDERAL ENTITY (RFE)
******

REGISTRATION STATUS **ACTIVE**	REGISTRATION STATUS DATE **07/22/2010**

REASON FOR REGISTRATION STATUS

SPECIAL STATUS *******	SPECIAL STATUS DATE *******

It was approved by Normative Instruction RFB No. 2.119, dated December 6, 2022.

It was issued on **08/21/2024** at **9:45:04 AM** (Brasília date and time). Page: **1/1**

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English, as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

_____ **Date: July 8, 2026**

REPÚBLICA FEDERATIVA DO BRASIL

CADASTRO NACIONAL DA PESSOA JURÍDICA

NÚMERO DE INSCRIÇÃO	COMPROVANTE DE INSCRIÇÃO E DE SITUAÇÃO CADASTRAL	DATA DE ABERTURA
12.349.468/0001-75 **MATRIZ**		**22/07/2010**

NOME EMPRESARIAL
E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA

TÍTULO DO ESTABELECIMENTO (NOME DE FANTASIA)	PORTE
********	**DEMAIS**

CÓDIGO E DESCRIÇÃO DA ATIVIDADE ECONÔMICA PRINCIPAL
62.04-0-00 - Consultoria em tecnologia da informação

CÓDIGO E DESCRIÇÃO DAS ATIVIDADES ECONÔMICAS SECUNDÁRIAS
62.02-3-00 - Desenvolvimento e licenciamento de programas de computador customizáveis
62.03-1-00 - Desenvolvimento e licenciamento de programas de computador não-customizáveis

CÓDIGO E DESCRIÇÃO DA NATUREZA JURÍDICA
206-2 - Sociedade Empresária Limitada

LOGRADOURO	NÚMERO	COMPLEMENTO
AV PAES DE BARROS	**3333**	**CASA**

CEP	BAIRRO/DISTRITO	MUNICÍPIO	UF
03.149-100	**PARQUE DA MOOCA**	**SAO PAULO**	**SP**

ENDEREÇO ELETRÔNICO	TELEFONE
FISCAL@E-IT.NET	**(11) 3774-5740/ (11) 4654-5580**

ENTE FEDERATIVO RESPONSÁVEL (EFR)
*****

SITUAÇÃO CADASTRAL	DATA DA SITUAÇÃO CADASTRAL
ATIVA	**22/07/2010**

MOTIVO DE SITUAÇÃO CADASTRAL

SITUAÇÃO ESPECIAL	DATA DA SITUAÇÃO ESPECIAL
********	********

Aprovado pela Instrução Normativa RFB nº 2.119, de 06 de dezembro de 2022.

Emitido no dia **21/08/2024** às **09:45:04** (data e hora de Brasília). Página: **1/1**

GOVERNMENT OF THE STATE OF SÃO PAULO
SECRETARIAT OF ECONOMIC DEVELOPMENT
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

FULL CERTIFICATE OF INCORPORATION

DOCUMENT ISSUED VIA THE INTERNET

COMPANY INFORMATION			
CORPORATE NAME E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA		LEGAL FORM LIMITED LIABILITY COMPANY	
NIRE 35224511288	CNPJ 12.349.468/0001-75	FILING NUMBER 1.270.592/24-5	FILING DATE 10/16/2024

CERTIFICATE INFORMATION		
ISSUE DATE 10/17/2024	TIME OF ISSUE 1:18:23 PM	CONTROL CODE 249724809
THE AUTHENTICITY OF THIS DOCUMENT, AS WELL AS ITS ELECTRONIC VERSION, CAN BE VERIFIED AT WWW.JUCESPONLINE.SP.GOV.BR		

THIS COPY WAS DIGITALLY AUTHENTICATED AND SIGNED ON 10/17/2024 BY THE JUCESP SECRETARY GENERAL – MARINA CENTURION DARDANI, UNDER ARTICLE 1 OF PROVISIONAL MEASURE NO. 2.200-2 OF 08/24/2001, WHICH ESTABLISHED THE BRAZILIAN PUBLIC KEY INFRASTRUCTURE – ICP-BRASIL, IN FORCE PURSUANT TO CONSTITUTIONAL AMENDMENT NO. 32 OF 09/11/2001 – ARTICLE 2.

ARTICLE 1. THE BRAZILIAN PUBLIC KEY INFRASTRUCTURE – ICP-BRASIL IS HEREBY ESTABLISHED TO ENSURE THE AUTHENTICITY, INTEGRITY, AND LEGAL VALIDITY OF ELECTRONIC DOCUMENTS, SUPPORTING APPLICATIONS, AND ENABLED APPLICATIONS THAT USE DIGITAL CERTIFICATES, AS WELL AS THE PERFORMANCE OF SECURE ELECTRONIC TRANSACTIONS.

LATEST DOCUMENT FILED FOR THE ABOVE-MENTIONED COMPANY.

JUCESP
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

JUCESP

SÃO PAULO
State Government

Application Cover

DOC. SEQ.
01
01

Redesim Protocol

SPN2464181907

REGISTRATION DATA

ACT(S):
Capital Increase and Amendment to Share Capital and Ownership Structure (QSA)

CORPORATE NAME		SIZE
E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA.		**Other**
STREET **AVENIDA PAES DE BARROS**		NUMBER **3333**
COMPLEMENT	NEIGHBORHOOD | DISTRICT **PARQUE DA MOOCA**	ZIP CODE **03149100**
CITY **SÃO PAULO**		STATE **SP**
E-MAIL **carla@doccontabilidade.com.br**		PHONE
REQUIREMENT NUMBER(S) **NO PRIOR REQUIREMENTS**	CNPJ - REGISTERED OFFICE **12349468000175**	NIRE - REGISTERED OFFICE **35224511288**

SIGNATORY IDENTIFICATION / APPLICATION COVER SIGNER

NAME: **CARLA ALVARES CHIOMENTO – Responsible Party**

DATE OF SIGNATURE:

SIGNATURE:

AMOUNTS PAID

DARE **R$ 251.76**

DARF **Exempt**

I DECLARE, UNDER PENALTY OF LAW, THAT THE INFORMATION CONTAINED IN THIS APPLICATION/PROCESS IS TRUE AND ACCURATE.

FOR EXCLUSIVE USE BY THE COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO (INCLUDING BACK PAGE)

PROTOCOL STAMP	NOTES:

DOCUMENTS NOT PICKED UP WITHIN 90 DAYS OF AVAILABILITY WILL BE DISCARDED – ART. 57, §5, DECREE 1.800/96

JUCESP
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

6th AMENDMENT TO THE ARTICLES OF ASSOCIATION
OF THE LIMITED LIABILITY COMPANY

E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA.
CNPJ No. 12.349.468/0001-75
NIRE No. 35224511288

By this private instrument of Articles of Association:

LUCIANO APARECIDO DE SOUZA, Brazilian, married under the partial community property regime, born on 08/15/1979, entrepreneur, holder of Identity Card (ID) No. 35.803.491 SSP/SP on 04/24/1997, enrolled with CPF No. 286.551.298-36, residing and domiciled at Rua José Gonçalves Galeão, No. 93, Apartment 132, Jardim Avelino Neighborhood, São Paulo/SP, ZIP Code 03227-150;

RAPHAEL NOVAES SOUSA BERTANI, Brazilian, married under the partial community property regime, born on 02/07/1983, entrepreneur, holder of Identity Card (ID) No. 30.308.862-X SSP/SP on 07/19/2002, enrolled with CPF No. 296.984.498-25, residing and domiciled at Rua Avaré, No. 214, Apartment 11, Baeta Neves Neighborhood, São Bernardo do Campo/SP, ZIP Code 09751-060;

Being the sole quotaholders of the Limited Liability Company **E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA**., enrolled with the CNPJ under No. 12.349.468/0001-75, with its registered office at Avenida Paes de Barros, No. 3333, Mooca, São Paulo/SP, ZIP Code 03149-100, hereby resolve to amend the Articles of Association as follows:

CLAUSE ONE

The quotaholder **LUCIANO APARECIDO DE SOUZA**, holder of **10,850** (**ten thousand eight hundred fifty)** quotas, with a total value of R$542,500.00 (five hundred forty-two thousand five hundred reais), hereby assigns and transfers, **FREE OF CHARGE**, 1,500 (one thousand five hundred) quotas, with a total value of R$75,000.00 (seventy-five thousand reais), to the quotaholder **RAPHAEL NOVAES SOUSA BERTANI**.

CLAUSE TWO

The share capital is **R$550,000.00 (five hundred fifty thousand reais)**, divided into 11,000 (eleven thousand) quotas, with a nominal value of R$50.00 (fifty reais) each, in the lawful currency of Brazil.

QUOTAHOLDERS	QUOTAS	R$	%
LUCIANO APARECIDO DE SOUZA	9,350	467,500.00	85%
RAPHAEL NOVAES SOUSA BERTANI	1,650	82,500.00	15%
TOTAL	**11,000**	**R$ 550,000.00**	**100%**

As a result of the amendments set forth above, the quotaholders resolve to CONSOLIDATE the Articles of Association, which shall henceforth read as follows:

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

CONSOLIDATED ARTICLES OF ASSOCIATION

E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA.
CNPJ No. 12.349.468/0001-75
NIRE No. 35224511288

CHAPTER I – CORPORATE NAME AND REGISTERED OFFICE

Clause 1. The company's corporate name is **E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA.**

Clause 2. The company's registered office is located at **Avenida Paes de Barros, No. 3333, Mooca, São Paulo/SP, ZIP Code 03149-100.**

Sole Paragraph. The company may, at any time, establish, maintain, or close branches, subsidiaries, or representative offices anywhere within Brazil or abroad.

CHAPTER II – CORPORATE PURPOSE AND TERM

Clause 3. The company's corporate purpose consists of:

a) **the provision of advisory, consulting, guidance, operational support, project monitoring, management, and project supervision services in the field of information technology;**
b) **the development and licensing of customizable computer software;**
c) **the development and licensing of non-customizable computer software.**

Clause 4. The company commenced its activities on 07/13/2010, and shall have an indefinite term.

Sole Paragraph. The company may be dissolved at any time by resolution of the quotaholders adopted at a meeting specifically convened for such purpose, subject to the applicable quorum requirements and other relevant legal provisions.

CHAPTER III – SHARE CAPITAL

Clause 5. The company's share capital is **R$550,000.00 (five hundred fifty thousand reais)**, divided into 11,000 (eleven thousand) quotas, each with a nominal value of R$50.00 (fifty reais), fully subscribed and paid in, in the national currency, and distributed among the quotaholders as follows:

QUOTAHOLDERS	QUOTAS	R$	%
LUCIANO APARECIDO DE SOUZA	9,350	467,500.00	85%
RAPHAEL NOVAES SOUSA BERTANI	1,650	82,500.00	15%
TOTAL	**11,000**	**R$ 550,000.00**	**100%**

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

§1. Pursuant to Article 1,052 of Law No. 10,406, dated January 10, 2002, each quotaholder's liability shall be limited to the value of their quotas, and all quotaholders shall be jointly liable for the full payment of the company's share capital.

§2. The company's quotas are indivisible, and only one owner shall be recognized for each quota.

§3. Each quota entitles its holder to one vote at quotaholders' meetings/general meetings and in all other corporate resolutions.

CHAPTER IV – MANAGEMENT OF THE COMPANY

Clause 6. The company's business shall be managed by **LUCIANO APARECIDO DE SOUZA**, who shall have broad general powers to represent the company actively and passively, in and out of court, subject to the criteria established in this Clause and its paragraphs; the quotaholders may, at any time, resolve to appoint non-quotaholder managers, whether designated in the Articles of Association or by a separate instrument.

§1. The managers shall perform the duties, hold the positions, serve the terms of office, and exercise the powers assigned to them in the instrument of their appointment, in the absence of specific provisions, they shall be vested with general management powers, their terms of office shall be for an indefinite period, and they may be reappointed.

§2. The managers' compensation may be established in the instrument of their appointment, and the applicable resolution may also provide that the managers shall serve without compensation.

§3. The company shall not have a Fiscal Council.

Clause 7. The managers shall be responsible for the overall management of the company's business and for performing all acts necessary or convenient for such purpose, representing the company actively and passively, in and out of court, subject to the restrictions and limitations imposed by law, these Articles of Association, and the instrument of their appointment.

§1. The acts referred to in Clause 10, when assigned to or falling within the authority of the managers, may be performed only upon the express authorization of the quotaholders, granted through the appropriate corporate resolution.

§2. In addition to the matters set forth in Clause 10, the following acts may be performed by the managers only upon the express authorization of the quotaholders, granted through the appropriate corporate resolution:

a) the purchase, sale, lease, loaned for use, or any other form of encumbrance of fixed assets (permanent assets or property, plant, and equipment), whether movable or immovable, whose individual value exceeds R$300,000.00 (three hundred thousand reais);
b) the declaration, allocation, and distribution of profits;
c) the execution of loans or financing arrangements in amounts exceeding R$300,000.00 (three hundred thousand reais).

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

d) the sale, assignment, or encumbrance of equity interests;
e) the filing of an application for judicial reorganization or voluntary bankruptcy;
f) the merger, spin-off, consolidation, or dissolution of the company;
g) the establishment of branches and representative offices;
h) the incorporation, dissolution, or liquidation of companies in which this company is a quotaholder, as well as the execution of the respective amendments to their articles of association;
i) the execution of technology transfer agreements and agreements for the assignment of intellectual property rights or industrial property rights; and
j) the hiring of employees whose monthly compensation exceeds 15 (fifteen) times the minimum wage.

§3. The company may, at any time, appoint agents or attorneys-in-fact, provided that the respective power of attorney specifies the powers granted, the acts authorized, and the nature of the transactions they are authorized to perform. Powers of attorney shall remain valid for 24 (twenty-four) months, except for powers granted for judicial proceedings, which shall remain valid for an indefinite period.

Clause 8. Any acts by quotaholders, managers, attorneys-in-fact, representatives, or employees that involve the company in obligations, transactions, or operations unrelated to its corporate purpose, or apparently contrary to its interests, including suretyships, guarantees, endorsements, or any other guarantees granted in favor of third parties, are expressly prohibited and shall be null and void with respect to the company. Any person violating the provisions of this Clause shall be personally and unlimitedly liable for the acts performed and obligations assumed.

Sole Paragraph. Provided they are approved at a quotaholders' meeting/general meeting or upon the direct consent of the quotaholders pursuant to §8 of Clause 9 of these Articles of Association, the following shall be exempt from the prohibition established in this Clause: (i) the provision of surety for real property lease agreements entered into in the company's interest; and (ii) the granting of guarantees of any kind, whether secured by collateral or personal guarantees, in favor of affiliated, associated, controlled, or controlling companies, or other companies belonging to the same economic group.

CHAPTER V – CORPORATE RESOLUTIONS

Clause 9. Quotaholder resolutions, whether required by law or by these Articles of Association, shall be adopted at quotaholders' meetings/general meetings, by amendments to the Articles of Association, or through other corporate resolutions.

§1. A quotaholders' meeting/general meeting may be waived in the cases provided for by law or by these Articles of Association, as well as when the quotaholders decide the matter in writing, provided that the applicable approval quorum is observed.

§2. Any quotaholder may be represented in the resolution by another quotaholder, an attorney-at-law, or an attorney-in-fact vested with specific powers for that particular resolution. Written votes submitted by letter, telegram, facsimile, e-mail, or any other written means shall also be accepted, and the quotaholders transmitting their votes in such manner shall be deemed present.

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

§3. Quotaholders' meetings/general meetings shall be convened by any of the managers or by any of the quotaholders by means of e-mail, telegram, letter, or facsimile, with proof of dispatch and receipt, and shall specify the date, time, and place of the meeting, as well as the matters to be discussed and resolved (agenda). Publication of the notice provided for in Article 1,152 of the Brazilian Civil Code is hereby waived for all notices convening quotaholders' meetings/general meetings.

§4. Quotaholders' meetings/general meetings shall be convened by means of two notices, the first at least 8 (eight) days in advance and the second at least 5 (five) days in advance, except when (i) the quotaholders voluntarily attend the meeting, (ii) the quotaholders resolve to hold the meeting on an urgent basis, or (iii) all quotaholders acknowledge in writing that they are aware of the date, time, and place of the meeting.

§5. A quotaholders' meeting/general meeting shall be duly constituted upon the presence of quotaholders representing an absolute majority of the share capital and shall preferably be chaired by one of the managers or, at the discretion of those present, by any other person, including a non-quotaholder, elected at the meeting. The chairperson shall appoint the secretary.

§6. Minutes of each quotaholders' meeting/general meeting shall be prepared and filed with the appropriate Public Registry of Commercial Enterprises.

§7. In the event of a tie vote, a new quotaholders' meeting/general meeting shall be convened within a minimum period of 30 (thirty) days to deliberate on the disputed matter; should the deadlock or tie persist, and if the quotaholders do not agree to submit the matter to a third party for decision, the matter shall be decided by the Judiciary in the interest of the company.

§8. The holding of a quotaholders' meeting/general meeting for the approval or authorization of acts, transactions, or agreements shall be waived whenever the quotaholders holding a sufficient ownership interest to authorize such acts, transactions, or agreements appear directly as consenting parties thereto.

Clause 10. The following acts and matters shall be approved in accordance with the quorum requirements set forth below:

I. The following matters shall be authorized, determined, and/or approved by the affirmative vote of quotaholders representing an absolute majority, corresponding to any percentage exceeding 50% (fifty percent) of the share capital:

a) the management accounts and the respective financial statements and accounting records;
b) the exclusion of a quotaholder for just cause;
c) the appointment of quotaholder-managers, when made by a separate instrument;
d) the removal of non-quotaholder managers appointed by a separate instrument or under the Articles of Association.

II. The following matters shall be authorized, determined, and/or approved by the affirmative vote of quotaholders representing 2/3 (two-thirds) of the share capital:
a) the removal of quotaholder-managers appointed by a separate instrument or under the Articles of Association;
b) the appointment of non-quotaholder managers, when made by a separate instrument.

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

c) the filing by the company of an application for judicial reorganization or voluntary bankruptcy;
d) the other matters referred to in §3 of Clause 7 that are not expressly provided for in this Clause 10.

III. The following matters shall be authorized, determined, and/or approved by the affirmative vote of quotaholders representing 3/4 (three-fourths) of the share capital:
a) the exclusion of a quotaholder from the company, regardless of just cause, upon liquidation of such quotaholder's ownership interest and the corresponding reduction of the share capital;
b) an increase or reduction of the share capital;
c) amendments to the Articles of Association;
d) the admission of new quotaholders or the authorization for the transfer, assignment, or sale of quotas to third parties who are not quotaholders of the company;
e) the dissolution and liquidation of the company, or the termination of its liquidation;
f) the merger, spin-off, or consolidation of the company;
g) the conversion of the company into another type of business entity.

Sole Paragraph. The quotaholders express their understanding and intention that, whenever permitted by law, all corporate resolutions shall be approved by the affirmative vote of an absolute majority of the share capital, accordingly, the approval quorums set forth in items II and III above shall be automatically reduced whenever a subsequent legal provision establishes lower quorum requirements for such matters.

CHAPTER VI – FISCAL YEAR, FINANCIAL STATEMENTS, AND ALLOCATION OF PROFITS

Clause 11. The fiscal year shall coincide with the calendar year, as of December 31 of each year, the managers shall prepare the balance sheet, the income statement, and the other accounting and financial statements required by law, in accordance with the accounting principles generally accepted in the country.

§1. The company shall prepare monthly trial balances for the determination of its results and, unless otherwise expressly resolved by the quotaholders, shall distribute profits and dividends on a monthly basis.

§2. The consolidated financial and accounting statements for each fiscal year shall be submitted to the quotaholders by March 31 of the following year, and the quotaholders shall meet to deliberate on their approval no later than April 30 of that same year.

Clause 12. The profits determined shall be distributed among the quotaholders in the proportions established by agreement or resolution of the quotaholders, in the absence of such agreement or specific resolution, the profits shall be distributed in proportion to each quotaholder's ownership interest or, if so determined, shall be recorded in the company's retained earnings account.

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

CHAPTER VII – RIGHT OF FIRST REFUSAL AND ADMISSION OF THIRD PARTIES TO THE COMPANY

Clause 13. The company's quotas may not be assigned or transferred to third parties without the express consent of the quotaholders, Partners wishing to acquire them, under equal terms and conditions, shall have a right of first refusal.

§1. The admission of third parties to the company shall be subject to approval by resolution of the quotaholders, it is expressly agreed that, without the consent of quotaholders representing 75% (seventy-five percent) of the share capital, no third party shall be admitted to the company; in such event, the withdrawing quotaholder's quotas shall be mandatorily liquidated based on the company's financial position and the applicable legal provisions.

§2. The provisions of the preceding paragraph shall also apply in the event of the death of a quotaholder, accordingly, the deceased quotaholder's heirs and successors shall be admitted to the company only upon the appropriate resolution of the quotaholders, and the duly appointed administrator of the decedent's estate shall exercise the voting rights attached to the deceased quotaholder's quotas.

§3. A quotaholder wishing to transfer all or part of their quotas shall notify the other quotaholders in writing of such intention, indicating the name of the prospective transferee, the agreed price, and the terms and method of payment.

§4. If, within 30 (thirty) days from receipt of such notice, none of the other quotaholders expresses an interest in acquiring the offered quotas, a quotaholders' meeting/general meeting shall be held within 15 (fifteen) days to deliberate on the admission of the proposed third party. Failure to adopt a resolution shall constitute a refusal to admit the proposed third party.

§5. The quotaholders undertake, on their own behalf and on behalf of their successors, to observe the right of first refusal and the restrictions on the admission of third parties established in this Clause, even if their quotas are contributed to another company as a capital contribution.

CHAPTER VIII – DISSOLUTION AND LIQUIDATION OF THE COMPANY

Clause 14. Whenever quotaholders representing more than one-half of the share capital determine that one or more quotaholders are jeopardizing the continuity of the company by reason of acts of undeniable seriousness, such quotaholder(s) shall be expelled from the company for just cause by means of an amendment to the Articles of Association.

Sole Paragraph. A quotaholder shall also be expelled from the company by operation of law:

a) pursuant to a court order;
b) for committing a serious breach of their obligations or as a result of a subsequent incapacity.

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

Clause 15. In the event of the dissolution of the company, the liquidator shall be appointed by resolution of the quotaholders, and the company's assets shall be used to satisfy its obligations, any remaining balance shall be distributed among the quotaholders in proportion to their respective ownership interests in the share capital.

Clause 16. The company shall not be dissolved by reason of the death, bankruptcy, expulsion, dissent, or withdrawal of any quotaholder, and shall continue its operations with the remaining quotaholders unless they resolve, through a quotaholders' resolution, to dissolve the company.

§1. The quotas of a deceased, bankrupt, judicially reorganized, expelled, dissenting, or withdrawing quotaholder shall be liquidated based on their respective equity value as determined by a balance sheet specially prepared for such purpose within 30 (thirty) days. Payment shall be made within the longest period permitted by law.

§2. Any profits attributable to a deceased, bankrupt, judicially reorganized, expelled, dissenting, or withdrawing quotaholder shall be calculated and payable through the date on which such quotaholder effectively ceased to be a member of the company or, in the case of death, through the date of death. In the case of a quotaholder-manager, compensation arising from the management position shall be due through the date on which such person ceases to perform their managerial duties.

CHAPTER IX – GOVERNING LAW, SUCCESSORS, AND VENUE

Clause 17. The company shall be governed by the provisions of these Articles of Association and by Articles 1,052 through 1,087 of Law No. 10,406, dated January 10, 2002, in matters not expressly provided for herein, the provisions governing business companies shall apply on a supplementary basis.

Clause 18. These Articles of Association shall also be binding upon the quotaholders' successors, whether by singular or universal succession.

Clause 19. The courts of the Judicial District of São Paulo, are hereby elected as the exclusive venue for the resolution of any questions and/or disputes arising out of these Articles of Association.

São Paulo, May 28, 2024

LUCIANO APARECIDO DE SOUZA

RAPHAEL NOVAES SOUSA BERTANI

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and sign 0/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

6th AMENDMENT.pdf
Document Code: ab5e5814-0d56-4785-a6e2-038ddbaebc0d

Signatures

LUCIANO APARECIDO DE SOUZA
gabrielafreitas.juridico@gmail.com
Signed

RAPHAEL NOVAES SOUSA BERTANI
gabrielafreitas.juridico@gmail.com
Signed



Document Events

July 31, 2024, 6:47:52 PM
Document ab5e5814-0d56-4785-a6e2-038ddbaebc0d **created** by GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com. DATE_ATOM: 2024-07-31T6:47:52 PM-03:00

July 31, 2024, 6:49:01 PM
Signature process **initiated** by GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com. DATE_ATOM: 2024-07-31T6:49:01 PM-03:00

October 4, 2024, 9:50:39 AM
IN-PERSON SIGNATURE – LUCIANO APARECIDO DE SOUZA **Signed** (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com (not verified) - IP Address: 186.220.36.185 (badc24b9.virtua.com.br, port 25102) - Geolocation: -23.587023169690386, -46.572321215684234 - Identification document provided: 286.551.298-36 - DATE_ATOM: 2024-10-04T09:50:39 AM-03:00

October 7, 2024, 10:19:41 AM
GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com. **REMOVED** the signatory **gabrielafreitas.juridico@gmail.com** - DATE_ATOM: 2024-10-07T10:19:41 AM-03:00

October 7, 2024, 10:19:49 AM
GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com. **ADDED** the signatory **gabrielafreitas.juridico@gmail.com** - DATE_ATOM: 2024-10-07T10:19:49 AM-03:00

October 7, 2024, 12:14:31 PM

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO
II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE I ...ÁTICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenti... ...e registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

IN-PERSON SIGNATURE – RAPHAEL NOVAES SOUSA BERTANI **Signed** (c32387c0-f313-4c66-a4d6-c89757879c3f) - E-mail: gabrielafreitas.juridico@gmail.com (not verified) - IP Address: 177.175.114.52 (177-175-114-52.user.vivozap.com.br, port 6154) - Geolocation: -23.7278658, -46.5682673 - Identification document provided: 296.984.498-25 - DATE_ATOM: 2024-10-07T12:14:31 PM-03:00

Hash of the Original Document
(SHA256):4f806fdf752654871210dcd94eb257f0caff0ebef5a15c8553b6e24a74062871
(SHA512):bcdae0e1801b362a3396d3e7d13c98297936e2441d7103a92f17c846c990cc84d21842f1c9b3549499c299b46baaa7e3dfc71346cc81ddc4ceda3c059f15695d

This log belongs **solely** and **exclusively** to the HASH documents above.

This document has been signed and certified by D4Sign.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE IN ORMA ICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authentici registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

DECLARATION OF AUTHENTICITY

I, **CARLA ALVARES CHIOMENTO**, holding an active registration with the Regional Accounting Council of São Paulo under No. **1SP187213**, issued on **11/05/1999**, and enrolled under CPF No. 10432985840, HEREBY DECLARE, under penalty of criminal law and without prejudice to any applicable administrative and civil sanctions, that this document is authentic and conforms to the original.
Documents submitted:

Amendment Document

Other Documents File (Private Documents)

São Paulo, 10/09/2024.

_____

CARLA ALVARES CHIOMENTO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

REVIEW AND DECISION STATEMENT.

I hereby approve the request(s) filed under Protocol No. **SPN2464181907** regarding the Capital Increase and Amendment to the Share Capital and Ownership Structure (QSA) of **E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA.**

This Decision Order is signed via digital certificate by the Examiner, **Ana Claudia Jacintho.**

Commercial Registry of the State of São Paulo, 10/16/2024.

Ana Claudia Jacintho, CPF No. 10761455825

This document was digitally signed by Ana Claudia Jacintho and forms an integral part of Protocol No. SPN2464181907

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

AUTHENTICATION AND REGISTRATION CERTIFICATE

I hereby certify that the digitally signed instrument of **E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA**, **NIRE No. 35224511288**, filed under Protocol No. **SPN2464181907** on **10/16/2024** has been registered with the Commercial Registry of the State of São Paulo (JUCESP) under Registration No. **1270592245**.

The registration is signed by the General Secretary, **Marina Centurion Dardani.**

The authenticity of this document, as well as the electronic file, may be verified on the website **www.jucesp.sp.gov.br** by entering the authentication number shown on the cover page of the Full Certificate of Incorporation.

Commercial Registry of the State of São Paulo, 10/16/2024.

Marina Centurion Dardani, CPF: 22059603854

R. Guaicurus, 1394 | ZIP Code 05033-060 | Lapa, São Paulo – SP
Phone: (11) 3468-3080

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

SIGNATURE PROTOCOL

The above document was submitted for digital signature through the VRE Digital platform.

The individuals designated as signatories, together with their signature status as of 07/25/2024, are as follows:

Full Name	CPF	Date and Time	Certificate
CONTRATO SOCIAL PDFA.pdf			
CARLA ALVARES CHIOMENTO	10432985840	10/09/24 4:51 PM	AC Instituto Fenacon RFB G3 / PDF-1.7
CRC CARLA pdfa.pdf			
CARLA ALVARES CHIOMENTO	10432985840	10/09/24 4:51 PM	AC Instituto Fenacon RFB G3 / PDF-1.7
Arquivo de Declaração de Autenticidade.pdf			
CARLA ALVARES CHIOMENTO	10432985840	10/09/24 4:51 PM	AC Instituto Fenacon RFB G3 / PDF-1.4

This document serves as a record of the electronic signatures affixed to the documents filed under Protocol No. SPN2464181907.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

II hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1,270,592/24-5 on 10/16/2024, under NIRE No. 35224511288, filed under Protocol No. SPN2464181907. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARINA CENTURION DARDANI – General Secretary. Authentication No. 249724809. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana _____ **Date: July 8, 2026**

GOVERNO DO ESTADO DE SÃO PAULO
SECRETARIA DE DESENVOLVIMENTO ECONÔMICO
JUNTA COMERCIAL DO ESTADO DE SÃO PAULO

CERTIDÃO DE INTEIRO TEOR

DOCUMENTO EMITIDO PELA INTERNET

DADOS DA EMPRESA			
NOME EMPRESARIAL E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA		TIPO JURÍDICO SOCIEDADE LIMITADA	
NIRE 35224511288	CNPJ 12.349.468/0001-75	NÚMERO DO ARQUIVAMENTO 1.270.592/24-5	DATA DO ARQUIVAMENTO 16/10/2024

DADOS DA CERTIDÃO		
DATA DE EXPEDIÇÃO 17/10/2024	HORA DE EXPEDIÇÃO 13:18:23	CÓDIGO DE CONTROLE 249724809
A AUTENTICIDADE DO PRESENTE DOCUMENTO, BEM COMO O ARQUIVO NA FORMA ELETRÔNICA PODEM SER VERIFICADOS NO ENDEREÇO WWW.JUCESPONLINE.SP.GOV.BR		

ESTA CÓPIA FOI AUTENTICADA DIGITALMENTE E ASSINADA EM 17/10/2024 PELA SECRETÁRIA GERAL DA JUCESP – MARINA CENTURION DARDANI, CONFORME ART. 1º DA MP2200-2 DE 24/08/2001, QUE INSTITUI A INFRAESTRUTURA DE CHAVES PÚBLICAS BRASILEIRAS – ICP BRASIL, EM VIGOR CONSOANTE E.C Nº32 DE 11/09/2001 M- ART.2º.

ART 1º. FICA INSTITUÍDA A INFRAESTRUTURA DE CHAVES PÚBLICAS BRASILEIRA – ICP BRASIL, PARA GARANTIR AUTENTICIDADE, INTEGRIDADE E VALIDADE JURÍDICA DE DOCUMENTOS EM FORMA ELETRÔNICA, DAS APLICAÇÕES DE SUPORTE E DAS APLICAÇÕES HABILITADAS QUE UTILIZEM CERTIFICADOS DIGITAIS, BEM COMO A REALIZAÇÃO DE TRANSAÇÕES ELETRÔNICAS SEGURAS.

ÚLTIMO DOCUMENTO ARQUIVADO PARA EMPRESA SUPRACITADA.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI - Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

JUCESP

SÃO PAULO
GOVERNO DO ESTADO

Requerimento Capa

SEQ. DOC
01
01

Protocolo Redesim

SPN2464181907

DADOS CADASTRAIS

ATO(S)
Alteração de Capital e QSA

NOME EMPRESARIAL		PORTE
E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA		**Demais**
LOGRADOURO		NÚMERO
AVENIDA PAES DE BARROS		**3333**
COMPLEMENTO	BAIRRO/DISTRITO	CEP
	PARQUE DA MOOCA	**03149100**
MUNICÍPIO		UF
SÃO PAULO		**SP**
E-MAIL		TELEFONE
carla@doccontabilidade.com.br		
NÚMERO EXIGÊNCIA (S)	CNPJ - SEDE	NIRE - SEDE
SEM EXIGÊNCIA ANTERIOR	**12349468000175**	**35224511288**

IDENTIFICAÇÃO DO SIGNATÁRIO/ASSINANTE DO REQUERIMENTO CAPA

NOME: **CARLA ALVARES CHIOMENTO - Responsável**

DATA ASSINATURA:

ASSINATURA:

VALORES RECOLHIDOS

DARE **R$ 251,76**

DARF **Isento**

DECLARO, SOB AS PENAS DA LEI, QUE AS INFORMAÇÕES CONSTANTES DO REQUERIMENTO/PROCESSO SÃO EXPRESSÃO DA VERDADE.

PARA USO EXCLUSIVO DA JUNTA COMERCIAL DO ESTADO DE SÃO PAULO (INCLUSIVE VERSO)

CARIMBO PROTOCOLO	OBSERVAÇÕES:

DOCUMENTOS NÃO RETIRADOS EM ATÉ 90 DIAS DA DISPONIBILIDADE SERÃO DESCARTADOS - ART. 57, §5º, DECRETO 1.800/96

JUCESP Junta Comercial do Estado de São Paulo

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

6ª ALTERAÇÃO CONTRATUAL DA SOCIEDADE EMPRESÁRIA LIMITADA

"E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA"
CNPJ 12.349.468/0001-75
NIRE 35224511288

Pelo presente instrumento particular de contrato social:

LUCIANO APARECIDO DE SOUZA, brasileiro, casado em regime de comunhão parcial de bens, nascido em 15/08/1979, empresário, portador da cédula de identidade RG nº 35.803.491 SSP/SP, expedido em 24/04/1997, inscrito no CPF nº.286.551.298-36, residente e domiciliado na Rua José Gonçalves Galeão, n° 93, apartamento 132- Bairro Jardim Avelino-São Paulo/SP, CEP 03227-150

RAPHAEL NOVAES SOUSA BERTANI, brasileiro, casado em regime de comunhão parcial de bens, nascido em 07/02/1983, empresário, portador da cédula de identidade RG nº 30.308.862-X SSP/SP, expedido em19/07/2002 inscrito no CPF nº.296.984.498-25, residente e domiciliado na Rua Avaré n°214, apartamento 11, Bairro Baeta Neves- São Bernardo do Campo/SP, CEP 09751-060.

Únicos sócios da Sociedade Limitada denominada **E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA**, inscrita no CNPJ sob o nº. 12.349.468/0001-75, com sede e foro na Avenida Paes de Barros, n°3333, Mooca, São Paulo/SP, CEP 03149-100 resolvem proceder à alteração do contrato social pelos motivos abaixo:

CLÁUSULA PRIMEIRA

O sócio **LUCIANO APARECIDO DE SOUZA,** detentor de **10.850 (dez mil, oitocentas e cinquenta)** quotas no valor de R$ 542.500,00 (quinhentos e quarenta e dois mil e quinhentos reais), cede e transfere a título **GRATUITO,** 1.500 (mil e quinhentas) quotas no valor de R$ 75.000,00 (setenta e cinco mil reais) para o sócio **RAPHAEL NOVAES SOUSA BERTANI**.

CLÁUSULA SEGUNDA

O capital social é de **R$ 550.000,00 (quinhentos e cinquenta mil reais),** divididos em 11.000 (onze mil) quotas, no valor nominal de R$ 50,00 (cinquenta reais) cada uma, em moeda corrente do País.

SÓCIOS	QUOTAS	R$	%
LUCIANO APARECIDO DE SOUZA	9.350	467.500,00	85%
RAPHAEL NOVAES SOUSA BERTANI	1.650	82.500,00	15%
TOTAL	**11.000**	**R$ 550.000,00**	**100%**

Em consequência das alterações mencionadas, os sócios resolvem CONSOLIDAR o Contrato Social com a seguinte redação:

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

CONTRATO SOCIAL CONSOLIDADO

"E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA"
CNPJ 12.349.468/0001-75
NIRE 35224511288

CAPÍTULO I- DENOMINAÇÃO E SEDE

Cláusula 1°- A sociedade tem denominação de "**E-IT TECHNOLOGIES CONSULTORIA DE INFORMÁTICA LTDA."**

Cláusula 2°- A sede da Sociedade fica estabelecida na **Avenida Paes de Barros, 3333, Mooca, São Paulo/SP, CEP: 03149-100.**

Parágrafo único- A Sociedade poderá abrir, manter e fechar, a qualquer tempo, estabelecimentos, filiais ou escritórios de representação, em todo o território nacional ou no exterior.

CAPÍTULO II- OBJETO SOCIAL E DURAÇÃO

Cláusula 3°- O objeto social da Sociedade compreende:

a) **A prestação de serviços de assessoria, consultoria, orientação, assistência operacional, acompanhamento, gerência e fiscalização de projeto em tecnologia da informação;**
b) **O desenvolvimento e licenciamento de programas de computador customizáveis;**
c) **O desenvolvimento e licenciamento de programas de computador não- customizáveis;**

Cláusula 4°- A Sociedade iniciou suas atividades na data de 13/07/2010, e seu prazo de duração é indeterminado.

Parágrafo Único: A Sociedade poderá ser dissolvida a qualquer tempo, por deliberação dos sócios em reunião especificamente convocada para este fim, observando-se o quórum e demais disposições legais da espécie.

CAPÍTULO III- CAPITAL SOCIAL

Cláusula 5°- O Capital da Sociedade é de **R$ 550.000,00 (quinhentos e cinquenta mil reais),** divididos em 11.000 (onze mil) quotas, no valor nominal de R$ 50,00 (cinquenta reais) cada uma, já inteiramente subscrito e integralizado, em moeda corrente nacional, assim distribuído aos sócios:

SÓCIOS	QUOTAS	R$	%
LUCIANO APARECIDO DE SOUZA	9.350	467.500,00	85%
RAPHAEL NOVAES SOUSA BERTANI	1.650	82.500,00	15%
TOTAL	**11.000**	**R$ 550.000,00**	**100%**

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

§ 1º- Conforme disposto no artigo 1.052, da Lei 10.406 de 10 de janeiro de 2002, a responsabilidade de cada sócio será restrita ao valor de suas quotas, respondendo todos, solidariamente, pela integralização do Capital Social.

§ 2º- As quotas sociais são indivisíveis, reconhecendo-se apenas um proprietário para cada quota.

§ 3º- Cada quota social corresponde a um voto nas reuniões/assembleias de sócios, e demais deliberações sociais.

CAPÍTULO IV- ADMINISTRAÇÃO DA SOCIEDADE

Cláusula 6°- Os negócios serão geridos por **LUCIANO APARECIDO DE SOUZA,** com amplos e gerais poderes, podendo representar a Sociedade ativa e passivamente, judicial e extrajudicialmente, respeitados os critérios estabelecidos nessa Cláusula e seus parágrafos, podendo os sócios a qualquer tempo deliberar acerca da nomeação de administradores não sócios, nomeados no Contrato Social ou em ato separado.

§ 1º- Os administradores terão as funções, cargos, prazos de mandato e poderes que lhes forem atribuídos no ato de sua designação, sendo que, no silêncio, ficarão investidos de poderes gerais de administração e seus mandatos terão prazo indeterminado, sendo ainda permitida a recondução.

§ 2º- A remuneração dos administradores poderá ser estabelecida no ato de sua designação, podendo a deliberação estabelecer que os administradores não perceberão qualquer remuneração.

§ 3º- A Sociedade não terá Conselho Fiscal instalado.

Cláusula 7°- Compete aos administradores, a gestão dos negócios sociais em geral e a prática de todos os atos necessários ou convenientes para esse fim, representando a Sociedade ativa e passivamente, judicial e extrajudicialmente, respeitadas as restrições e limites impostos por lei, por este Contrato Social, e no ato de designação.

§ 1º- Os atos dispostos na Cláusula 10ª, quando atribuídos ou de competência de administradores, somente poderão ser por estes praticados após a expressa autorização dos Sócios, proveniente da competente deliberação social.

§ 2º- Além das hipóteses dispostas na Cláusula 10ª, os atos a seguir relacionados somente poderão ser praticados pelos administradores após a expressa autorização dos Sócios, proveniente da competente deliberação social:

a) A compra, a venda, a locação, a cessão em comodato, ou qualquer outra forma de oneração, de bens do ativo fixo (ativo permanente ou ativo imobilizado), móveis ou imóveis, cujo o valor individual exceda a quantia de R$ 300.000,00 (trezentos mil reais);
b) A declaração, a destinação e a distribuição de lucros;
c) A contratação de empréstimos ou financiamentos de valor que sejam superiores a R$ 300.000,00 (trezentos mil reais);

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

d) A alienação, cessão ou oneração de participações societárias;
e) O pedido de recuperação judicial ou autofalência;
f) A incorporação, cisão, fusão, e a dissolução da sociedade;
g) A abertura de filiais e de escritórios de representação;
h) A constituição, a dissolução, ou a liquidação de sociedades, assim como o processamento das respectivas alterações contratuais, das quais esta sociedade seja sócia;
i) A celebração de contratos de transferência de tecnologia, de cessão de direitos de propriedade intelectual ou direitos de propriedade industrial; e,
j) A contratação de empregados, cuja remuneração mensal seja superior a 15 (quinze) salários mínimos;

§ 3º- A Sociedade poderá, a qualquer tempo, constituir mandatários ou procuradores, desde que estejam especificados no instrumento de procuração ou poderes, atos e a natureza das operações cuja prática está autorizada. As procurações terão prazo de validade de 24 (vinte e quatro) meses, salvo os mandatos judiciais que terão prazo indeterminado.

Cláusula 8°- São expressamente proibidos, sendo nulos e inoperantes com relação à Sociedade, os atos de qualquer dos Sócios, administradores, procuradores, prepostos ou empregados que a envolverem em obrigações, negócios ou operações estranhas ao objeto social, ou aparentemente conflitante com seus interesses, inclusive fianças, avais, endossos ou qualquer outra garantia em favor de terceiros. Aqueles que infringirem o disposto nesse parágrafo ficarão pessoal e ilimitadamente responsáveis pelos atos praticados e obrigações assumidas.

Parágrafo único- Desde que aprovados em reunião/assembleia de Sócios ou havendo anuência direta desses conforme parágrafo 8° da Cláusula 9ª deste Contrato exclui-se da proibição estabelecida nesta Cláusula: (i) a prestação de fiança em contratos de locação de imóveis de interesse da Sociedade; e (ii) a prestação de garantias de quaisquer espécies, reais ou fidejussórias, em favor de Sociedades ligadas, coligadas, controladas ou controladoras, ou outras Sociedades pertencentes ao mesmo grupo econômico.

CAPÍTULO V- DELIBERAÇÕES SOCIETÁRIAS

Cláusula 9°- As deliberações de Sócios, quer previstas em lei ou no Contrato Social serão tornadas em reuniões/assembleias de Sócios, em alterações do Contrato Social ou outros atos deliberativos.

§ 1º- A reunião/assembleia de Sócios poderá ser dispensada nos casos previstos na lei ou neste Contrato Social, assim como no caso dos Sócios decidirem, por escrito, sobre a matéria a ela sujeita, observando-se o respectivo quórum de aprovação.

§ 2º- Qualquer Sócio poderá ser representado na deliberação por outro Sócio, por advogado ou por procurador com poderes específicos para aquela deliberação. Admite-se ainda o voto escrito, por carta, telegrama, fac-simile, correio eletrônico ou outra forma escrita, considerando-se presentes os Sócios que assim o transmitirem.

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

JUCESP Junta Comercial do Estado de São Paulo
Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

§ 3º- As reuniões/assembleias de Sócios serão convocadas por qualquer dos administradores, ou por qualquer dos Sócios, mediante correio eletrônico, telegrama, carta ou fac-simile, contendo comprovação de envio e recebimento, e deverá especificar o dia, hora e local, e as matérias a serem debatidas e deliberadas (ordem do dia). Fica dispensada a publicação a que dispõe o artigo 1.152 do Código Civil vigente para todas as convocações de todas as reuniões/ assembleias dos sócios.

§ 4º- As reuniões/ assembleias de Sócios serão convocadas duas vezes, sendo a primeira com 8 (oito) dias de antecedência e a segunda com 5 (cinco) dias de antecedência, salvo quando (i) os Sócios compareçam espontaneamente à reunião/ assembleia, (ii) os Sócios deliberarem pela sua realização em caráter de urgência, ou (iii) todos os Sócios informarem em documento escrito sua ciência do local, data e hora da reunião/ assembleia.

§ 5º- A reunião/ assembleia instala-se com a presença dos Sócios que perfaçam a maioria absoluta do capital social, e será preferencialmente presidida por um dos administradores, ou a critério dos presentes por qualquer desses inclusive terceiros não-Sócios, eleito na ocasião. O presidente, por sua ver, designará o secretário.

§ 6º- Da reunião/ assembleia realizada será lavrada uma ata, que será levada a arquivamento perante o competente Registro Público de Empresa Mercantis.

§ 7º- Havendo empate, nova reunião/ assembleia para deliberar sobre a matéria controvertida, será convocada no prazo mínimo de 30 (trinta) dias, e permanecendo o impasse ou empate, e os Sócios não concordarem em submeter a decisão a um terceiro, caberá ao Poder Judiciário decidir, no interesse da Sociedade.

§ 8º- Dispensa- se na realização da reunião/ assembleia de sócios, para aprovação ou autorização de atos, negócios ou contratos, quando os Sócios detentores da participação societária suficiente para sua autorização comparecerem diretamente nesses atos, negócios ou contratos, na qualidade de anuentes.

Cláusula 10°- Fica estabelecido que os atos e matérias abaixo relacionados deverão ser aprovados conforme o quórum a seguir descrito:

I- Pela concordância dos Sócios que representem a maioria absoluta, a qual corresponde a qualquer quantia superior a 50% (cinquenta por cento) do Capital Social, serão autorizadas, definidas e/ou aprovadas:

a) As contas da administração, e respectivos demonstrativos financeiros e contábeis;
b) Exclusão de Sócio por justa causa.
c) Designação de administradores Sócios, quando feita em ato separado;
d) Destituição de administradores não Sócios, designados em ato separado ou no Contrato Social;

II- Pela concordância dos Sócios que representem 2/3 (dois terços) do Capital Social serão autorizadas, definidas e/o aprovadas;

a) Destituição de administradores Sócios, designados em ato separado ou no Contrato Social;
b) Designação de administradores não-Sócios, quando feita em ato separado;

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

c) Pedido de recuperação judicial da Sociedade, ou de autofalência;
d) Demais hipóteses do § 3° da Cláusula 7ª que não estejam expressamente previsto nesta Cláusula 10ª.

III- Pela concordância dos Sócios que representem 3/ 4 (três quartos) do Capital Social serão autorizadas, definidas e/ ou aprovadas;

a) Exclusão de Sócio da Sociedade, independentemente de justa causa, mediante liquidação de sua participação, e consequente redução do Capital Social;
b) Aumento ou redução do Capital Social;
c) Alteração do Contrato Social;
d) Admissão de novos Sócios, ou a autorização para transferência, cessão ou alienação de quotas sociais para terceiros estranhos aos quadros sociais;
e) Dissolução e liquidação da Sociedade, ou a cessação do estado de liquidação;
f) Fusão, cisão ou incorporação da Sociedade;
g) Transformação da Sociedade em outro tipo societário.

Parágrafo único- Os Sócios manifestam seu entendimento e vontade de que todas as deliberações sociais sejam, desde permitido em lei, aprovadas pela concordância da maioria absoluta do capital social, ficando estabelecidos que os quóruns de aprovação mencionados nos incisos II e III retro serão automaticamente reduzidos por ocasião de superveniência de texto ou disposição legal que reduza esses respectivos limites.

CAPÍTULO VI- EXERCÍCIO SOCIAL, DEMONSTRAÇÕES FINANCEIRAS E DESTINAÇÃO DE RESULTADOS

Cláusula 11°- O exercício social coincidirá com o ano civil, sendo que a 31 de dezembro de cada ano, os administradores farão elaborar o balanço patrimonial, a demonstração do resultado e as demais demonstrações contábeis e financeiras exigidas em lei, e em conformidade com os princípios de contabilidade aceitos no país.

§ 1º- A Sociedade levantará balancetes mensais de apuração de resultados, e salvo no caso de expressa deliberação dos Sócios em contrário, realizará mensalmente a distribuição de lucros e dividendos.

§ 2º- As demonstrações financeiras e contábeis consolidadas, relativas ao exercício social, serão apresentadas aos Sócios até o dia 31 de março do ano seguinte ao do exercício, devendo aos Sócios reunir-se para deliberar sobre sua aprovação até o dia 30 de abril do mesmo ano.

Cláusula 12°- Os lucros apurados serão distribuídos entre os Sócios nas proporções definidas em acordo ou deliberação de sócios, e na omissão ou inexistência de deliberação específica, serão distribuídos na proporção de cada respectiva participação, ou, se assim convier, serão escriturados na conta de lucros suspensos da sociedade**.**

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

CAPÍTULO VII- DIREITO DE PREFERÊNCIA E ADMISSÃO DE TERCEIROS NA SOCIEDADE

Cláusula 13°- As quotas da Sociedade não poderão ser cedidas ou transferidas para terceiros sem o expresso consentimento dos Sócios, cabendo, em igualdade de condições, o direito de preferência aos Sócios que queiram adquiri-las.

§ 1º- A admissão de terceiros na Sociedade será aprovada em deliberação de Sócios, ficando expressamente ajustado que sem a concordância dos Sócios que representem 75% (setenta e cinco por cento) do capital social, nenhum terceiro será admitido na Sociedade, hipótese na qual as quotas do Sócio retirante serão obrigatoriamente liquidadas com base na situação patrimonial da Sociedade, e nas normas legais em vigor.

§ 2º- Aplica-se o disposto no parágrafo anterior no caso de falecimento de Sócio, de forma que seus herdeiros e sucessores somente serão admitidos na Sociedade após competente deliberação de Sócios, exercendo o inventariante do Espólio, devidamente constituído, o direito de voto das quotas do Sócio falecido.

§ 3º- O Sócio que quiser transferir suas quotas de Capital, ou parte delas, comunicará por escrito os demais Sócios sua intenção, indicando o nome do pretendente, o preço ajustado, o prazo e a forma de pagamento.

§ 4º-Se ao término de 30 (trinta) dias contados do recebimento do aviso aos demais Sócios não interessar a aquisição das quotas oferecidas, realizar-se á dentro de 15 (quinze) dias a reunião/ assembleia de Sócios para deliberação sobre admissão do terceiro indicado. A ausência de deliberação pressupõe recusa à admissão do terceiro.

§ 5º- Os Sócios quotistas obrigam-se, por si e por seus sucessores, a respeitar o direito de preferência e limites à admissão de terceiros dispostos nesta Cláusula, ainda que as quotas sociais por eles detidas venham a ser conferidas, a título de integralização de Capital, a outra Sociedade.

CAPÍTULO VIII- DISSOLUÇÃO E LIQUIDAÇÃO DE SOCIEDADE

Cláusula 14°- Quando a Sociedade, representada por mais da metade do capital social, entender que um ou mais sócios estiverem colocando em risco a continuidade da Sociedade, em virtude de atos inegável gravidade, estes serão excluídos por justa causa da Sociedade, mediante alteração do contrato social.

Parágrafo único: Também será excluído o Sócio, de pleno direito.

a) Por decisão judicial;
b) Que cometer falta grave no cumprimento de suas obrigações ou ainda por incapacidade superveniente.

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

Cláusula 15°- Em caso de dissolução da Sociedade, o liquidante será indicado em deliberação de Sócios, e os haveres da Sociedade serão empregados na quitação de suas obrigações, sendo o remanescente, se houver, rateado entre os Sócios na proporção das respectivas participações no capital social.

Cláusula 16°- A Sociedade não se dissolverá por morte, falência, exclusão dissidência ou retirada de qualquer dos Sócios, prosseguindo com os Sócios remanescentes, a menos que estes, em deliberação de Sócios, resolvam extingui-la.

§ 1º- As quotas sociais do Sócio falecido, falido, em recuperação judicial, excluído, dissidente ou retirante serão liquidadas, com base no respectivo valor patrimonial apurado em balanço especialmente levantado em até 30 (trinta) dias, para este fim. O pagamento será realizado no maior prazo permitido por lei.

§ 2º- Os lucros, se existentes, do Sócio falecido, falido, em recuperação judicial, excluído, dissidente ou retirante, serão apurados e devidos até o dia em que os Sócios efetivamente deixarem a Sociedade, ou tenha falecido. No caso de Sócio administrador, a remuneração decorrente do cargo de administração será devida ate o dia em que este deixar de exercer suas funções.

CAPÍTULO IX- REGÊNCIA, SUCESSORES E FORO

Cláusula 17°- A Sociedade será regida pelo disposto neste Contrato Social, e pelo estabelecido nos artigos 1.052 e 1.087 da Lei 10.406 de 10 de janeiro de 2002, aplicando- se, nos casos omissos, supletivamente, as normas que regulamentam o funcionamento das Sociedades Empresárias.

Cláusula 18°- O presente Contrato Social obriga também todos os sucessores dos Sócios, a título singular e universal.

Cláusula 19°- Fica eleito o Foro da Comarca de São Paulo, como competente para dirimir as dúvidas e/ ou controvérsias oriundas deste Contrato Social.

São Paulo, 28 de maio de 2024.

_____ _____

LUCIANO APARECIDO DE SOUZA **RAPHAEL NOVAES SOUSA BERTANI**

D4Sign ab5e5814-0d56-4785-a6e2-038ddbaebc0d - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

10 páginas - Datas e horários baseados em Brasília, Brasil
Sincronizado com o NTP.br e Observatório Nacional (ON)
Certificado de assinaturas gerado em 07 de October de 2024, 15:59:47

6ª ALTERACAO pdf

Código do documento ab5e5814-0d56-4785-a6e2-038ddbaebc0d

Assinaturas

LUCIANO APARECIDO DE SOUZA
gabrielafreitas.juridico@gmail.com
Assinou

RAPHAEL NOVAES SOUSA BERTANI
gabrielafreitas.juridico@gmail.com
Assinou



Eventos do documento

31 Jul 2024, 18:47:52
Documento ab5e5814-0d56-4785-a6e2-038ddbaebc0d **criado** por GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). Email:gabrielafreitas.juridico@gmail.com. - DATE_ATOM: 2024-07-31T18:47:52-03:00

31 Jul 2024, 18:49:01
Assinaturas **iniciadas** por GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). Email: gabrielafreitas.juridico@gmail.com. - DATE_ATOM: 2024-07-31T18:49:01-03:00

04 Oct 2024, 09:50:39
ASSINATURA PRESENCIAL - LUCIANO APARECIDO DE SOUZA **Assinou** (c32387c0-f313-4c66-a4d6-c89757879c3f) - Email: gabrielafreitas.juridico@gmail.com (não verificado) - IP: 186.220.36.185 (badc24b9.virtua.com.br porta: 25102) - Geolocalização: -23.587023169690386 -46.572321215684234 - Documento de identificação informado: 286.551.298-36 - DATE_ATOM: 2024-10-04T09:50:39-03:00

07 Oct 2024, 10:19:41
GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). Email: gabrielafreitas.juridico@gmail.com. **REMOVEU** o signatário **gabrielafreitas.juridico@gmail.com** - DATE_ATOM: 2024-10-07T10:19:41-03:00

07 Oct 2024, 10:19:49
GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). Email: gabrielafreitas.juridico@gmail.com. **ADICIONOU** o signatário **gabrielafreitas.juridico@gmail.com** - DATE_ATOM: 2024-10-07T10:19:49-03:00

07 Oct 2024, 12:14:31

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

10 páginas - Datas e horários baseados em Brasília, Brasil
Sincronizado com o NTP.br e Observatório Nacional (ON)
Certificado de assinaturas gerado em 07 de October de 2024, 15:59:47

ASSINATURA PRESENCIAL - RAPHAEL NOVAES SOUSA BERTANI **Assinou** (c32387c0-f313-4c66-a4d6-c89757879c3f) - Email: gabrielafreitas.juridico@gmail.com (não verificado) - IP: 177.175.114.52 (177-175-114-52.user.vivozap.com.br porta: 6154) - Geolocalização: -23.7278658 -46.5682673 - Documento de identificação informado: 296.984.498-25 - DATE_ATOM: 2024-10-07T12:14:31-03:00

Hash do documento original
(SHA256):4f806fdf752654871210dcd94eb257f0caff0ebef5a15c8553b6e24a74062871
(SHA512):bcdae0e1801b362a3396d3e7d13c98297936e2441d7103a92f17c846c990cc84d21842f1c9b3549499c299b46baaa7e3dfc71346cc81ddc4ceda3c059f15695d

Esse log pertence **única** e **exclusivamente** aos documentos de HASH acima

Esse documento está assinado e certificado pela D4Sign

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

DECLARAÇÃO DE AUTENTICIDADE

Eu **CARLA ALVARES CHIOMENTO** com inscrição ativa na(o) Conselho Regional de Contabilidade de São Paulo sob o nº **1SP187213**, expedida em **05/11/1999**, inscrito no CPF nº 10432985840, DECLARO, sob as penas da Lei penal e, sem prejuízo das sanções administrativas e cíveis, que este documento é autêntico e condiz com o original.

Documentos apresentados:

Arquivo de Alteração

Arquivo de Outros (Docs. privados)

São Paulo, 09/10/2024.

_____

CARLA ALVARES CHIOMENTO

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

TERMO DE ANÁLISE E DECISÃO.

Defiro a (s) solicitação (ões), sob o (s) protocolo (s) **SPN2464181907** de Alteração de Capital e QSA da empresa **E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA**.

Assina o presente termo de decisão, mediante certificado digital, o Julgador **Ana Claudia Jacintho**.

Junta Comercial do Estado de São Paulo, 16/10/2024.

Ana Claudia Jacintho, CPF: 10761455825

Este documento foi assinado digitalmente por Ana Claudia Jacintho e é parte integrante sob o protocolo Nº SPN2464181907.

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

TERMO DE AUTENTICAÇÃO E REGISTRO

Autentico que o ato, assinado digitalmente, pertencente a empresa **E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA de NIRE 35224511288**, protocolizado sob o número **SPN2464181907** em **16/10/2024**, encontra-se registrado na JUCESP sob o número **1270592245**.

Assina o registro a Secretária-Geral **Marina Centurion Dardani**.

A autenticidade do presente documento, bem como o arquivo na forma eletrônica, poderão ser verificados no sítio eletrônico: www.jucesp.sp.gov.br, mediante a indicação do número de autenticidade disponível na capa da certidão de inteiro teor.

Junta Comercial do Estado de São Paulo, 16/10/2024.

Marina Centurion Dardani, CPF: 22059603854

R. Guaicurus, 1394 | CEP 05033-060 | Lapa, São Paulo – SP
Fone: (11) 3468-3080

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

PROTOCOLO DE ASSINATURAS

O documento acima foi proposto para assinatura digital na plataforma VRE Digital.

Os nomes indicados para assinatura, bem como seus status em 25/07/2024 são:

Nome Completo	CPF	Data e hora	Certificado
CONTRATO SOCIAL PDFA.pdf			
CARLA ALVARES CHIOMENTO	10432985840	09/10/24 16:51	AC Instituto Fenacon RFB G3 / PDF-1.7
CRC CARLA pdfa.pdf			
CARLA ALVARES CHIOMENTO	10432985840	09/10/24 16:51	AC Instituto Fenacon RFB G3 / PDF-1.7
Arquivo de Declaração de Autenticidade.pdf			
CARLA ALVARES CHIOMENTO	10432985840	09/10/24 16:51	AC Instituto Fenacon RFB G3 / PDF-1.4

Este documento é referência das assinaturas eletrônicas realizada nas documentações do protocolo Nº SPN2464181907

Certifico o registro sob o nº 1.270.592/24-5 em 16/10/2024 da empresa E- IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA, NIRE nº 35224511288, protocolado sob o nº SPN2464181907. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARINA CENTURION DARDANI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 17/10/2024 por MARINA CENTURION DARDANI – Secretária Geral. Autenticação: 249724809. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

FEDERATIVE REPUBLIC OF BRAZIL

NATIONAL REGISTER OF LEGAL ENTITIES

REGISTRATION NUMBER	CERTIFICATE OF ENROLLMENT AND REGISTRATION STATUS	DATE OF INCORPORATION
31.412.442/0001-79 **HEAD OFFICE**		**09/03/2018**

COMPANY NAME
E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA.

TRADE NAME (DBA)	SIZE
E-IT	**OTHERS**

CODE AND DESCRIPTION OF MAIN ECONOMIC ACTIVITY
62.04-0-00 – Information Technology Consulting

CODE AND DESCRIPTION OF SECONDARY ECONOMIC ACTIVITIES
62.02-3-00 – Development and Licensing of Customizable Computer Software **62.03-1-00 – Development and Licensing of Non-Customizable Computer Software**

CODE AND DESCRIPTION OF LEGAL NATURE
206-2 - Limited Liability Company

ADDRESS	NUMBER	UNIT
AV PAES DE BARROS	**3333**	**1st FLOOR**

ZIP CODE	NEIGHBORHOOD/DISTRICT	CITY	STATE
03.149-100	**PARQUE DA MOOCA**	**SAO PAULO**	**SP**

EMAIL ADDRESS	PHONE NUMBER
FISCAL@E-IT.NET	**11) 3774-5740/ (11) 3774-5740**

RESPONSIBLE FEDERAL ENTITY (RFE)
******

REGISTRATION STATUS	REGISTRATION STATUS DATE
ACTIVE	**09/03/2018**

REASON FOR REGISTRATION STATUS

SPECIAL STATUS	SPECIAL STATUS DATE
*******	*******

It was approved by Normative Instruction RFB No. 2.119, dated December 6, 2022.

It was issued on **10/10/2025** at **10:41:37 AM** (Brasília date and time). Page: **1/1**

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English, as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

_____ **Date: July 8, 2026**

REPÚBLICA FEDERATIVA DO BRASIL

CADASTRO NACIONAL DA PESSOA JURÍDICA

NÚMERO DE INSCRIÇÃO	COMPROVANTE DE INSCRIÇÃO E DE SITUAÇÃO CADASTRAL	DATA DE ABERTURA
31.412.442/0001-79 **MATRIZ**		**03/09/2018**

NOME EMPRESARIAL
E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA.

TÍTULO DO ESTABELECIMENTO (NOME DE FANTASIA)	PORTE
E-IT	**DEMAIS**

CÓDIGO E DESCRIÇÃO DA ATIVIDADE ECONÔMICA PRINCIPAL
62.04-0-00 - Consultoria em tecnologia da informação

CÓDIGO E DESCRIÇÃO DAS ATIVIDADES ECONÔMICAS SECUNDÁRIAS
62.02-3-00 - Desenvolvimento e licenciamento de programas de computador customizáveis
62.03-1-00 - Desenvolvimento e licenciamento de programas de computador não-customizáveis

CÓDIGO E DESCRIÇÃO DA NATUREZA JURÍDICA
206-2 - Sociedade Empresária Limitada

LOGRADOURO	NÚMERO	COMPLEMENTO
AV PAES DE BARROS	**3333**	**ANDAR 1**

CEP	BAIRRO/DISTRITO	MUNICÍPIO	UF
03.149-100	**PARQUE DA MOOCA**	**SAO PAULO**	**SP**

ENDEREÇO ELETRÔNICO	TELEFONE
FISCAL@E-IT.NET	**(11) 3774-5740/ (11) 3774-5740**

ENTE FEDERATIVO RESPONSÁVEL (EFR)
*****

SITUAÇÃO CADASTRAL	DATA DA SITUAÇÃO CADASTRAL
ATIVA	**03/09/2018**

MOTIVO DE SITUAÇÃO CADASTRAL

SITUAÇÃO ESPECIAL	DATA DA SITUAÇÃO ESPECIAL
********	********

Aprovado pela Instrução Normativa RFB nº 2.119, de 06 de dezembro de 2022.

Emitido no dia **10/10/2025** às **10:41:37** (data e hora de Brasília). Página: **1/1**

GOVERNMENT OF THE STATE OF SÃO PAULO
SECRETARIAT OF ECONOMIC DEVELOPMENT
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

SÃO PAULO State Government

JUCESP

FULL CERTIFICATE OF INCORPORATION

DOCUMENT ISSUED VIA THE INTERNET

COMPANY INFORMATION			
CORPORATE NAME E- IT SERVICES CONSULTORIA DE INFORMATICA LTDA		LEGAL FORM LIMITED LIABILITY COMPANY	
NIRE 35235338841	CNPJ 31.412.442/0001-79	FILING NUMBER 1.157.233/24-7	FILING DATE 06/25/2024

CERTIFICATE INFORMATION		
ISSUE DATE 07/24/2024	TIME OF ISSUE 1:19:10 AM	CONTROL CODE 243342340
THE AUTHENTICITY OF THIS DOCUMENT, AS WELL AS ITS ELECTRONIC VERSION, CAN BE VERIFIED AT WWW.JUCESPONLINE.SP.GOV.BR		

THIS COPY WAS DIGITALLY AUTHENTICATED AND SIGNED ON 07/24/2024 BY THE JUCESP SECRETARY GENERAL – MARINA CENTURION DARDANI, UNDER ARTICLE 1 OF PROVISIONAL MEASURE NO. 2.200-2 OF 08/24/2001, WHICH ESTABLISHED THE BRAZILIAN PUBLIC KEY INFRASTRUCTURE – ICP-BRASIL, IN FORCE PURSUANT TO CONSTITUTIONAL AMENDMENT NO. 32 OF 09/11/2001 – ARTICLE 2.

ARTICLE 1. THE BRAZILIAN PUBLIC KEY INFRASTRUCTURE – ICP-BRASIL IS HEREBY ESTABLISHED TO ENSURE THE AUTHENTICITY, INTEGRITY, AND LEGAL VALIDITY OF ELECTRONIC DOCUMENTS, SUPPORTING APPLICATIONS, AND ENABLED APPLICATIONS THAT USE DIGITAL CERTIFICATES, AS WELL AS THE PERFORMANCE OF SECURE ELECTRONIC TRANSACTIONS.

LATEST DOCUMENT FILED FOR THE ABOVE-MENTIONED COMPANY.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

JUCESP

SÃO PAULO STATE GOVERNMENT

Application Cover

DOC. SEQ.
01
01

Redesim Protocol

SPJ2400083023

REGISTRATION DATA

ACT(S):
Amendment of Other Provisions; Consolidation of the Articles of Association (Head Office)

CORPORATE NAME		SIZE
E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA.		**Other**
STREET		NUMBER
AVENIDA PAES DE BARROS		**3333**
COMPLEMENT	NEIGHBORHOOD | DISTRICT	ZIP CODE
1st FLOOR	**PARQUE DA MOOCA**	**03149100**
CITY		STATE
SÃO PAULO		**SP**
E-MAIL		PHONE
domingos@doccontabilidade.com.br		
REQUIREMENT NUMBER(S)	CNPJ - REGISTERED OFFICE	NIRE - REGISTERED OFFICE
NO PRIOR REQUIREMENTS	**31412442000179**	**35235338841**

SIGNATORY IDENTIFICATION / APPLICATION COVER SIGNER

NAME: **DOMINGOS ORESTES CHIOMENTO – Responsible Party**

DATE OF SIGNATURE:

SIGNATURE:

AMOUNTS PAID

DARE **R$ 251.76**

DARF **Exempt**

I DECLARE, UNDER PENALTY OF LAW, THAT THE INFORMATION CONTAINED IN THIS APPLICATION/PROCESS IS TRUE AND ACCURATE.

FOR EXCLUSIVE USE BY THE COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO (INCLUDING BACK PAGE)

PROTOCOL STAMP	NOTES:

DOCUMENTS NOT PICKED UP WITHIN 90 DAYS OF AVAILABILITY WILL BE DISCARDED – ART. 57, §5, DECREE 1.800/96

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of this information at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

4th AMENDMENT TO THE ARTICLES OF ASSOCIATION OF THE LIMITED LIABILITY COMPANY

E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA.
CNPJ No. 31.412.442/0001-79
NIRE No. 35235338841

By this private instrument of Articles of Association:

LUCIANO APARECIDO DE SOUZA, Brazilian, married under the partial community property regime, born on 08/15/1979, entrepreneur, holder of Identity Card (ID) No. 35.803.491 SSP/SP, enrolled with CPF No. 286.551.298-36, residing and domiciled at Rua José Gonçalves Galeão, No. 93, Apartment 132, Jardim Avelino Neighborhood, São Paulo/SP, ZIP Code 03227-150;

RAPHAEL NOVAES SOUSA BERTANI, Brazilian, married under the partial community property regime, born on 02/07/1983, entrepreneur, holder of Identity Card (ID) No. 30.308.862-X SSP/SP, enrolled with CPF No. 296.984.498-25, residing and domiciled at Rua Avaré, No. 214, Apartment 11, Baeta Neves Neighborhood, São Bernardo do Campo/SP, ZIP Code 09751-060;

Being the sole quotaholders of the limited liability company **E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA.**, enrolled with the CNPJ under No. 31.412.442/0001-79, with its registered office at Avenida Paes de Barros, No. 3333, 1st Floor, Parque da Mooca, São Paulo/SP, ZIP Code 03149-100, hereby resolve to amend the Articles of Association as follows:

CLAUSE ONE

To amend items (a), (c), and (j) of Clause Seven of the Articles of Association as follows:

A) the purchase, sale, lease, gratuitous loan for use, or any other form of encumbrance of fixed assets (permanent assets or property, plant, and equipment), whether movable or immovable, whose individual value exceeds R$1,000,000.00 (one million reais);

C) the execution of loans or financing arrangements in amounts exceeding R$1,000,000.00 (one million reais);

J) the hiring of employees whose monthly compensation exceeds 50 (fifty) times the minimum wage.

CLAUSE TWO

To amend **§2 of Clause Sixteen** as follows:

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed electronically through the portal www.jucesponline.sp.gov.br.

- **§2.** Any profits attributable to a deceased, bankrupt, judicially reorganized, expelled, dissenting, or withdrawing quotaholder shall be determined and paid as follows: 10% (ten percent) of the amount determined shall be paid in a single initial installment, and the remaining balance shall be paid in 12 (twelve) equal monthly installments, without adjustment and without the accrual of interest. In the case of a quotaholder-manager, compensation arising from the management position shall be due through the date on which such person ceases to perform his or her managerial duties.

As a result of the amendments set forth above, the quotaholders resolve to CONSOLIDATE the Articles of Association, which shall henceforth read as follows:

CONSOLIDATED ARTICLES OF ASSOCIATION

E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA.
CNPJ No. 31.412.442/0001-79
NIRE No. 35235338841

CHAPTER I – CORPORATE NAME AND REGISTERED OFFICE

Clause 1. The company's corporate name is **E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA.**

Clause 2. The company's registered office is located at **Avenida Paes de Barros, No. 3333, 1st Floor, Parque da Mooca, São Paulo/SP, ZIP Code 03149-100.**

Sole Paragraph. The company may, at any time, establish, maintain, or close branches, subsidiaries, or representative offices anywhere within Brazil or abroad.

CHAPTER II – CORPORATE PURPOSE AND TERM

Clause 3. The company's corporate purpose consists of:

a) the provision of advisory, consulting, guidance, operational support, project monitoring, management, and project supervision services in the field of information technology;
b) the development and licensing of customizable computer software;
c) the development and licensing of non-customizable computer software.

Clause 4. The company commenced its activities on 08/01/2018, and shall have an indefinite term.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

Sole Paragraph. The company may be dissolved at any time by resolution of the quotaholders adopted at a meeting specifically convened for such purpose, subject to the applicable quorum requirements and other relevant legal provisions.

CHAPTER III – SHARE CAPITAL

Clause 5. The company's share capital is **R$ 10,000.00 (ten thousand reais)**, divided into 1,000 (one thousand) quotas, each with a nominal value of R$ 10.00 (ten reais), fully subscribed and paid in, in the national currency, and distributed among the quotaholders as follows:

QUOTAHOLDERS	QUOTAS	R$	%
LUCIANO APARECIDO DE SOUZA	850	R$ 8,500.00	85%
RAPHAEL NOVAES SOUSA BERTANI	150	R$ 1,500.00	15%
TOTAL	**1000**	**R$ 10,000.00**	**100%**

§1. Pursuant to Article 1,052 of Law No. 10,406, dated January 10, 2002, each quotaholder's liability shall be limited to the value of their quotas, and all quotaholders shall be jointly liable for the full payment of the company's share capital.

§2. The company's quotas are indivisible, and only one owner shall be recognized for each quota.

§3. Each quota entitles its holder to one vote at quotaholders' meetings/general meetings and in all other corporate resolutions.

CHAPTER IV – MANAGEMENT OF THE COMPANY

Clause 6. The company's business shall be managed individually by **LUCIANO APARECIDO DE SOUZA**, who shall have broad general powers to represent the company actively and passively, in and out of court, subject to the criteria established in this Clause and its paragraphs; the quotaholders may, at any time, resolve to appoint non-quotaholder managers, whether designated in these Articles of Association or by a separate instrument.

§1. The managers shall perform the duties, hold the positions, serve the terms of office, and exercise the powers assigned to them in the instrument of their appointment; in the absence of specific provisions, they shall be vested with general management powers, their terms of office shall be for an indefinite period, and they may be reappointed.

§2. The managers' compensation may be established in the instrument of their appointment, and the applicable resolution may also provide that the managers shall serve without compensation.

§3. The company shall not have a Fiscal Council.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed through the portal www.jucesponline.sp.gov.br.

Clause 7. The managers shall be responsible for the overall management of the company's business and for performing all acts necessary or convenient for such purpose, representing the company actively and passively, in and out of court, subject to the restrictions and limitations imposed by law, these Articles of Association, and the instrument of their appointment.

§1. The acts referred to in Clause 10, when assigned to or falling within the authority of the managers, may be performed only upon the express authorization of the quotaholders, granted through the appropriate corporate resolution.

§2. In addition to the matters set forth in Clause 10, the following acts may be performed by the managers only upon the express authorization of the quotaholders, granted through the appropriate corporate resolution:

a) the purchase, sale, lease, loaned for use, or any other form of encumbrance of fixed assets (permanent assets or property, plant, and equipment), whether movable or immovable, whose individual value exceeds R$1,000,000.00 (one million reais);

b) the declaration, allocation, and distribution of profits;

c) the execution of loans or financing arrangements in amounts exceeding R$1,000,000.00 (one million reais);

d) the sale, assignment, or encumbrance of equity interests;

e) the filing of an application for judicial reorganization or voluntary bankruptcy;

f) the merger, spin-off, consolidation, or dissolution of the company;

g) the establishment of branches and representative offices;

h) the incorporation, dissolution, or liquidation of companies in which this company is a quotaholder, as well as the execution of the respective amendments to their articles of association;

i) the execution of technology transfer agreements and agreements for the assignment of intellectual property rights or industrial property rights; and

j) the hiring of employees whose monthly compensation exceeds 50 (fifty) times the minimum wage.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

§3. The company may, at any time, appoint agents or attorneys-in-fact, provided that the respective power of attorney specifies the powers granted, the acts authorized, and the nature of the transactions they are authorized to perform. Powers of attorney shall remain valid for 24 (twenty-four) months, except for powers granted for judicial proceedings, which shall remain valid for an indefinite period.

Clause 8. Any acts by quotaholders, managers, attorneys-in-fact, representatives, or employees that involve the company in obligations, transactions, or operations unrelated to its corporate purpose, or apparently contrary to its interests, including suretyships, guarantees, endorsements, or any other guarantees granted in favor of third parties, are expressly prohibited and shall be null and void with respect to the company. Any person violating the provisions of this Clause shall be personally and unlimitedly liable for the acts performed and obligations assumed.

Sole Paragraph. Provided they are approved at a quotaholders' meeting/general meeting or upon the direct consent of the quotaholders pursuant to §8 of Clause 9 of these Articles of Association, the following shall be exempt from the prohibition established in this Clause: (i) the provision of surety for real property lease agreements entered into in the company's interest; and (ii) the granting of guarantees of any kind, whether secured by collateral or personal guarantees, in favor of affiliated, associated, controlled, or controlling companies, or other companies belonging to the same economic group.

CHAPTER V – CORPORATE RESOLUTIONS

Clause 9. Quotaholder resolutions, whether required by law or by these Articles of Association, shall be adopted at quotaholders' meetings/general meetings, by amendments to the Articles of Association, or through other corporate resolutions.

§1. A quotaholders' meeting/general meeting may be waived in the cases provided for by law or by these Articles of Association, as well as when the quotaholders decide the matter in writing, provided that the applicable approval quorum is observed.

§2. Any quotaholder may be represented in the resolution by another quotaholder, an attorney-at-law, or an attorney-in-fact vested with specific powers for that particular resolution. Written votes submitted by letter, telegram, facsimile, e-mail, or any other written means shall also be accepted, and the quotaholders transmitting their votes in such manner shall be deemed present.

§3. Quotaholders' meetings/general meetings shall be convened by any of the managers or by any of the quotaholders by means of e-mail, telegram, letter, or facsimile, with proof of dispatch and receipt, and shall specify the date, time, and place of the meeting, as well as the matters to be discussed and resolved (agenda). Publication of the notice provided for in Article 1,152 of the Brazilian Civil Code is hereby waived for all notices convening quotaholders' meetings/general meetings.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed digitally through the portal www.jucesponline.sp.gov.br.

§4. Quotaholders' meetings/general meetings shall be convened by means of two notices, the first at least 8 (eight) days in advance and the second at least 5 (five) days in advance, except when (i) the quotaholders voluntarily attend the meeting, (ii) the quotaholders resolve to hold the meeting on an urgent basis, or (iii) all quotaholders acknowledge in writing that they are aware of the date, time, and place of the meeting.

§5. A quotaholders' meeting/general meeting shall be duly constituted upon the presence of quotaholders representing an absolute majority of the share capital and shall preferably be chaired by one of the managers or, at the discretion of those present, by any other person, including a non-quotaholder, elected at the meeting. The chairperson shall appoint the secretary.

§6. Minutes of each quotaholders' meeting/general meeting shall be prepared and filed with the appropriate Public Registry of Commercial Enterprises.

§7. In the event of a tie vote, a new quotaholders' meeting/general meeting shall be convened within a minimum period of 30 (thirty) days to deliberate on the disputed matter. Should the deadlock or tie persist, and if the quotaholders do not agree to submit the matter to a third party for decision, the matter shall be decided by the Judiciary in the interest of the company.

§8. The holding of a quotaholders' meeting/general meeting for the approval or authorization of acts, transactions, or agreements shall be waived whenever the quotaholders holding a sufficient ownership interest to authorize such acts, transactions, or agreements appear directly as consenting parties thereto.

Clause 10. The following acts and matters shall be approved in accordance with the quorum requirements set forth below:

I. The following matters shall be authorized, determined, and/or approved by the affirmative vote of quotaholders representing an absolute majority, corresponding to any percentage exceeding 50% (fifty percent) of the share capital:

a) The management accounts and the respective financial statements and accounting records;

b) The exclusion of a quotaholder for just cause;

c) The appointment of quotaholder-managers, when made by a separate instrument;

d) The removal of non-quotaholder managers appointed by a separate instrument or under the Articles of Association.

II. The following matters shall be authorized, determined, and/or approved by the affirmative vote of quotaholders representing 2/3 (two-thirds) of the share capital:

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

a) The removal of quotaholder-managers appointed by a separate instrument or under the Articles of Association;

b) The appointment of non-quotaholder managers, when made by a separate instrument.

c) The filing by the company of an application for judicial reorganization or voluntary bankruptcy;

d) The other matters referred to in §3 of Clause 7 that are not expressly provided for in this Clause 10.

III. The following matters shall be authorized, determined, and/or approved by the affirmative vote of quotaholders representing 3/4 (three-fourths) of the share capital:

a) The exclusion of a quotaholder from the company, regardless of just cause, upon liquidation of such quotaholder's ownership interest and the corresponding reduction of the share capital;

b) An increase or reduction of the share capital;

c) Amendments to the Articles of Association;

d) The admission of new quotaholders or the authorization for the transfer, assignment, or sale of quotas to Third parties who are not quotaholders of the company;

e) The dissolution and liquidation of the company, or the termination of its liquidation;

f) The merger, spin-off, or consolidation of the company;

g) The conversion of the company into another type of business entity.

Sole Paragraph. The quotaholders express their understanding and intention that, whenever permitted by law, all corporate resolutions shall be approved by the affirmative vote of an absolute majority of the share capital, accordingly, the approval quorums set forth in items II and III above shall be automatically reduced whenever a subsequent legal provision establishes lower quorum requirements for such matters.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

CHAPTER VI – FISCAL YEAR, FINANCIAL STATEMENTS, AND ALLOCATION OF PROFITS

Clause 11. The fiscal year shall coincide with the calendar year, as of December 31 of each year, the managers shall prepare the balance sheet, the income statement, and the other accounting and financial statements required by law, in accordance with the accounting principles generally accepted in the country.

§1. The company shall prepare monthly trial balances for the determination of its results and, unless otherwise expressly resolved by the quotaholders, shall distribute profits and dividends on a monthly basis.

§2. The consolidated financial and accounting statements for each fiscal year shall be submitted to the quotaholders by March 31 of the following year, and the quotaholders shall meet to deliberate on their approval no later than April 30 of that same year.

Clause 12. The profits determined shall be distributed among the quotaholders in the proportions established by agreement or resolution of the quotaholders, in the absence of such agreement or specific resolution, the profits shall be distributed in proportion to each quotaholder's ownership interest or, if so determined, shall be recorded in the company's retained earnings account.

CHAPTER VII – RIGHT OF FIRST REFUSAL AND ADMISSION OF THIRD PARTIES TO THE COMPANY

Clause 13. The company's quotas may not be assigned or transferred to third parties without the express consent of the quotaholders, Partners wishing to acquire them, under equal terms and conditions, shall have a right of first refusal.

§1. The admission of third parties to the company shall be subject to approval by resolution of the quotaholders, it is expressly agreed that, without the consent of quotaholders representing 75% (seventy-five percent) of the share capital, no third party shall be admitted to the company; in such event, the withdrawing quotaholder's quotas shall be mandatorily liquidated based on the company's financial position and the applicable legal provisions.

§2. The provisions of the preceding paragraph shall also apply in the event of the death of a quotaholder, accordingly, the deceased quotaholder's heirs and successors shall be admitted to the company only upon the appropriate resolution of the quotaholders, and the duly appointed administrator of the decedent's estate shall exercise the voting rights attached to the deceased quotaholder's quotas.

§3. A quotaholder wishing to transfer all or part of their quotas shall notify the other quotaholders in writing of such intention, indicating the name of the prospective transferee, the agreed price, and the terms and method of payment.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

§4. If, within 30 (thirty) days from receipt of such notice, none of the other quotaholders expresses an interest in acquiring the offered quotas, a quotaholders' meeting/general meeting shall be held within 15 (fifteen) days to deliberate on the admission of the proposed third party. Failure to adopt a resolution shall constitute a refusal to admit the proposed third party,

§5. The quotaholders undertake, on their own behalf and on behalf of their successors, to observe the right of first refusal and the restrictions on the admission of third parties established in this Clause, even if their quotas are contributed to another company as a capital contribution.

CHAPTER VIII – DISSOLUTION AND LIQUIDATION OF THE COMPANY

Clause 14. Whenever quotaholders representing more than one-half of the share capital determine that one or more quotaholders are jeopardizing the continuity of the company by reason of acts of undeniable seriousness, such quotaholder(s) shall be expelled from the company for just cause by means of an amendment to the Articles of Association.

Sole Paragraph. A quotaholder shall also be expelled from the company by operation of law:

a) pursuant to a court order;

b) for committing a serious breach of their obligations or as a result of a subsequent incapacity.

Clause 15. In the event of the dissolution of the company, the liquidator shall be appointed by resolution of the quotaholders, and the company's assets shall be used to satisfy its obligations, any remaining balance shall be distributed among the quotaholders in proportion to their respective ownership interests in the share capital.

Clause 16. The company shall not be dissolved by reason of the death, bankruptcy, expulsion, dissent, or withdrawal of any quotaholder, and shall continue its operations with the remaining quotaholders unless they resolve, through a quotaholders' resolution, to dissolve the company.

§1. The quotas of a deceased, bankrupt, judicially reorganized, expelled, dissenting, or withdrawing quotaholder shall be liquidated based on their respective equity value as determined by a balance sheet specially prepared for such purpose within 30 (thirty) days. Payment shall be made within the longest period permitted by law.

§2. Any profits attributable to a deceased, bankrupt, judicially reorganized, expelled, dissenting, or withdrawing quotaholder shall be determined and settled via an initial installment of 10% (ten percent) of the amount determined shall be paid in a single initial installment, and the remaining balance shall be paid in 12 (twelve) equal monthly installments, without adjustment and without the accrual of interest. In the case of a quotaholder-manager, compensation arising from the management position shall be due through the date on which such person ceases to perform their managerial duties.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

CHAPTER IX – GOVERNING LAW, SUCCESSORS, AND VENUE

Clause 17. The company shall be governed by the provisions of these Articles of Association and by Articles 1,052 through 1,087 of Law No. 10,406, dated January 10, 2002, in matters not expressly provided for herein, the provisions governing business companies shall apply on a supplementary basis.

Clause 18. These Articles of Association shall also be binding upon the quotaholders' successors, whether by singular or universal succession.

Clause 19. The courts of the Judicial District of São Paulo, are hereby elected as the exclusive venue for the resolution of any questions and/or disputes arising out of these Articles of Association.

São Paulo, May 13, 2024

LUCIANO APARECIDO DE SOUZA

RAPHAEL NOVAES SOUSA BERTANI

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 – To verify the signatures, access https://secure.d4sign.com.br/verificar.
This document was electronically signed in accordance with Provisional Measure No. 2,200-2/2001, Article 10, §2.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed through the portal www.jucesponline.sp.gov.br.

12 pages – Dates and times based on Brasília, Brazil
Synchronized with NTP.br and the Brazilian National Observatory (ON)
Certificate of signatures generated on June 20, 2024, at 12:18:23 PM

ARTICLES OF ASSOCIATION.pdf

Document Code: 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7

Signatures

LUCIANO APARECIDO DE SOUZA
legalizacao@doccontabilidade.com.br
Signed

RAPHAEL NOVAES SOUSA BERTANI
legalizacao@doccontabilidade.com.br
Signed



Document Events

May 22, 2024, 8:22:08 PM
Document 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 **created** by GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com. DATE_ATOM: 2024-05-22T8:22:08 PM-03:00

May 22, 2024, 8:23:08 PM
Signature **initiated** by GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). E-mail: gabrielafreitas.juridico@gmail.com. - DATE_ATOM: 2024-05-22T8:23:08 PM-03:00

June 11, 2024, 4:05:57 PM
IN-PERSON SIGNATURE – RAPHAEL NOVAES SOUSA BERTANI **signed**. E-mail: legalizacao@doccontabilidade.com.br (not verified) - IP Address: 177.138.167.138 (177-138-167-138.dsl.telesp.net.br, port 23748). - Geolocation: -23.7278065, -46.5682041 - Identification document provided: 296.984.498-25 - DATE_ATOM: 2024-06-11T4:05:57 PM-03:00

June 18, 2024, 6:23:24 PM
IN-PERSON SIGNATURE – LUCIANO APARECIDO DE SOUZA **Signed**.- E-mail: legalizacao@doccontabilidade.com.br (not verified) - IP Address: 172.225.83.33 (a172-225-83-33.deploy.static.akamaitechnologies.com, port 42142) - Geolocation: -23.587331284329757, -46.57216172824515 - Identification document provided: 286.551.298-36 - DATE_ATOM: 2024-06-18T6:23:24 PM-03:00

Hash of the Original Document
(SHA256):56553e36c17c7aa18f6acedc91b61532156da681db507f5cd3640b5943dd626b
(SHA512):91a7a1af814e1e5dd4b059a780c521d9893490a68d037a58dbc0be809524630988cbb674175a7b88f4cc9c29a825951af8e9bcc7395f43c77e3745733f8a8277

JUCESP
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the information at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

This log belongs **solely** and **exclusively** to the HASH documents above.

This document has been signed and certified by D4Sign.

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

DECLARATION OF AUTHENTICITY

I, **DOMINGOS ORESTES CHIOMENTO**, holding an active registration with the Regional Accounting Council of São Paulo under No. **1SP032010**, issued on **04/06/1994**, and enrolled under CPF No. 00410993891, HEREBY DECLARE, under penalty of criminal law and without prejudice to any applicable administrative and civil sanctions, that this document is authentic and conforms to the original. Documents submitted:

Other Clauses File

Other Documents File (Private Documents)

São Paulo, 06/20/2024.

_____

DOMINGOS ORESTES CHIOMENTO

JUCESP
COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by ...ARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

REVIEW AND DECISION STATEMENT.

I hereby approve the request(s) filed under Protocol No. **SPJ2400083023** regarding the Amendment of Other Clauses and Consolidation of the Articles of Association (Head Office) for the company **E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA..**

This Decision Order is signed via digital certificate by the Examiner, **Carla Fabiana da Silva.**

Commercial Registry of the State of São Paulo, 06/25/2024.

Carla Fabiana da Silva, CPF: 29352502817

This document was digitally signed by Carla Fabiana da Silva and forms an integral part of Protocol No. SPJ2400083023.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of this declaration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

JUCESP

SÃO PAULO STATE GOVERNMENT

AUTHENTICATION AND REGISTRATION CERTIFICATE

I hereby certify that the digitally signed instrument of **E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE No. 35235338841,** filed under Protocol No. **SPJ2400083023** on **06/25/2024** has been registered with the Commercial Registry of the State of São Paulo (JUCESP) under Registration No. **1157233247**.

The registration is signed by the General Secretary, Maria Cristina Frei.

The authenticity of this document, as well as the electronic file, may be verified on the website **www.jucesp.sp.gov.br** by entering the authentication number shown on the cover page of the Full Certificate of Incorporation.

Commercial Registry of the State of São Paulo, 06/25/2024.

Maria Cristina Frei, CPF: 14804696881

R. Guaicurus, 1394 | ZIP Code 05033-060 | Lapa, São Paulo – SP
Phone: (11) 3468-3080

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of this registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024 by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

SIGNATURE PROTOCOL

The above document was submitted for digital signature through the VRE Digital platform.

The individuals designated as signatories, together with their signature status as of 05/22/2024, are as follows:

Full Name	CPF	Date and Time	Certificate
DOCS PDFA.pdf			
DOMINGOS ORESTES CHIOMENTO	00410993891	06/20/24 12:26 PM	AC Instituto Fenacon RFB G3 / PDF-1.7
CRC Domingos pdfa.pdf			
DOMINGOS ORESTES CHIOMENTO	00410993891	06/20/24 12:26 PM	AC Instituto Fenacon RFB G3 / PDF-1.7
Declaration of Authenticity File.pdf			
DOMINGOS ORESTES CHIOMENTO	00410993891	06/20/24 12:26 PM	AC Instituto Fenacon RFB G3 / PDF-1.4

This document serves as a record of the electronic signatures affixed to the documents filed under Protocol No. SPJ2400083023.

JUCESP COMMERCIAL REGISTRY OF THE STATE OF SÃO PAULO

I hereby certify that the company E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. was registered under No. 1.157.233/24-7 on 06/25/2024, under NIRE No. 35235338841, filed under Protocol No. SPJ2400083023. Authentication: verify the authenticity of the registration at http://www.jucesp.sp.gov.br using the registration number. MARINA CENTURION DARDANI – General Secretary. This copy was digitally authenticated and signed on 10/17/2024, by MARIA CRISTINA FREI – General Secretary. Authentication No. 243342340. JUCESP guarantees the authenticity of the registration and the Full Certificate of Incorporation when viewed directly through the portal www.jucesponline.sp.gov.br.

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana _____ **Date: July 9, 2026**

GOVERNO DO ESTADO DE SÃO PAULO
SECRETARIA DE DESENVOLVIMENTO ECONÔMICO
JUNTA COMERCIAL DO ESTADO DE SÃO PAULO

CERTIDÃO DE INTEIRO TEOR

DOCUMENTO EMITIDO PELA INTERNET

DADOS DA EMPRESA			
NOME EMPRESARIAL E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA.		TIPO JURÍDICO SOCIEDADE LIMITADA	
NIRE 35235338841	CNPJ 31.412.442/0001-79	NÚMERO DO ARQUIVAMENTO 1.157.233/24-7	DATA DO ARQUIVAMENTO 25/06/2024

DADOS DA CERTIDÃO		
DATA DE EXPEDIÇÃO 24/07/2024	HORA DE EXPEDIÇÃO 01:09:10	CÓDIGO DE CONTROLE 243342340
A AUTENTICIDADE DO PRESENTE DOCUMENTO, BEM COMO O ARQUIVO NA FORMA ELETRÔNICA PODEM SER VERIFICADOS NO ENDEREÇO WWW.JUCESPONLINE.SP.GOV.BR		

ESTA CÓPIA FOI AUTENTICADA DIGITALMENTE E ASSINADA EM 24/07/2024 PELA SECRETÁRIA GERAL DA JUCESP – MARIA CRISTINA FREI, CONFORME ART. 1º DA MP2200-2 DE 24/08/2001, QUE INSTITUI A INFRAESTRUTURA DE CHAVES PÚBLICAS BRASILEIRAS – ICP BRASIL, EM VIGOR CONSOANTE E.C Nº32 DE 11/09/2001 M- ART.2º.

ART 1º. FICA INSTITUÍDA A INFRAESTRUTURA DE CHAVES PÚBLICAS BRASILEIRA – ICP BRASIL, PARA GARANTIR AUTENTICIDADE, INTEGRIDADE E VALIDADE JURÍDICA DE DOCUMENTOS EM FORMA ELETRÔNICA, DAS APLICAÇÕES DE SUPORTE E DAS APLICAÇÕES HABILITADAS QUE UTILIZEM CERTIFICADOS DIGITAIS, BEM COMO A REALIZAÇÃO DE TRANSAÇÕES ELETRÔNICAS SEGURAS.

ÚLTIMO DOCUMENTO ARQUIVADO PARA EMPRESA SUPRACITADA.

JUCESP

GOVERNO DO ESTADO DE SÃO PAULO

Requerimento Capa

SEQ. DOC
01
01

Protocolo Redesim

SPJ2400083023

DADOS CADASTRAIS

ATO(S)

Alteração de Outras Cláusulas, Consolidação da Matriz

NOME EMPRESARIAL		PORTE
E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA.		**Demais**
LOGRADOURO		NÚMERO
AVENIDA PAES DE BARROS		**3333**
COMPLEMENTO	BAIRRO/DISTRITO	CEP
ANDAR 1	**PARQUE DA MOOCA**	**03149100**
MUNICÍPIO		UF
SÃO PAULO		**SP**
E-MAIL		TELEFONE
domingos@doccontabilidade.com.br		
NÚMERO EXIGÊNCIA (S)	CNPJ - SEDE	NIRE - SEDE
SEM EXIGÊNCIA ANTERIOR	**31412442000179**	**35235338841**

IDENTIFICAÇÃO DO SIGNATÁRIO/ASSINANTE DO REQUERIMENTO CAPA

NOME: **DOMINGOS ORESTES CHIOMENTO - Responsável**

DATA ASSINATURA:

ASSINATURA:

VALORES RECOLHIDOS

DARE **R$ 251,76**

DARF **Isento**

DECLARO, SOB AS PENAS DA LEI, QUE AS INFORMAÇÕES CONSTANTES DO REQUERIMENTO/PROCESSO SÃO EXPRESSÃO DA VERDADE.

PARA USO EXCLUSIVO DA JUNTA COMERCIAL DO ESTADO DE SÃO PAULO (INCLUSIVE VERSO)

CARIMBO PROTOCOLO	OBSERVAÇÕES:

DOCUMENTOS NÃO RETIRADOS EM ATÉ 90 DIAS DA DISPONIBILIDADE SERÃO DESCARTADOS - ART. 57, §5º, DECRETO 1.800/96

JUCESP Junta Comercial do Estado de São Paulo

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

4ª ALTERAÇÃO CONTRATUAL DA SOCIEDADE EMPRESÁRIA LIMITADA

"E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA"
CNPJ 31.412.442/0001-79
NIRE 35235338841

Pelo presente instrumento particular de contrato social:

LUCIANO APARECIDO DE SOUZA, brasileiro, casado em regime de comunhão parcial de bens, nascido em 15/08/1979, empresário, portador da cédula de identidade RG nº 35.803.491 SSP/SP, inscrito no CPF nº.286.551.298-36, residente e domiciliado na Rua José Gonçalves Galeão, n° 93, apartamento 132- Bairro Jardim Avelino, São Paulo/SP, CEP 03227-150.

RAPHAEL NOVAES SOUSA BERTANI, brasileiro, casado em regime de comunhão parcial de bens, nascido em 07/02/1983, empresário, portador da cédula de identidade RG nº 30.308.862-X SSP/SP, inscrito no CPF nº.296.984.498-25, residente e domiciliado na Rua Avaré n°214, apartamento 11, Bairro Baeta Neves- São Bernardo do Campo/SP, CEP 09751-060.

Únicos sócios da Sociedade Limitada denominada **E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA**, inscrita no CNPJ sob o nº. 31.412.442/0001-79, com sede e foro na Avenida Paes de Barros, n°3333, Andar 1, Parque da Mooca, São Paulo/SP, CEP 03149-100, resolve proceder à alteração do contrato social pelos motivos abaixo:

CLÁUSULA PRIMEIRA

Alterar a alínea A, C e J da **cláusula sétima do contrato social**, conforme abaixo:

A) A compra, a venda, a locação, a cessão em comodato, ou qualquer outra forma de oneração, de bens do ativo fixo (ativo permanente ou ativo imobilizado), móveis ou imóveis, cujo o valor individual exceda a quantia de R$ 1.000.000,00 (um milhão de reais);

C) A contratação de empréstimos ou financiamentos de valor que sejam superiores a R$ 1.000.000,00 (um milhão de reais);

J) A contratação de empregados, cuja remuneração mensal seja superior a 50 (cinquenta) salários mínimos;

CLÁUSULA SEGUNDA

Alterar o **parágrafo segundo da cláusula décima sexta**, conforme abaixo:

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

- **§ 2º**- Os lucros, se existentes, do Sócio falecido, falido, em recuperação judicial, excluído, dissidente ou retirante, serão apurados, devendo ser quitados em uma parcela inicial de 10% do preço apurado e o saldo em 12 parcelas mensais, iguais, não reajustadas e sem incidência de juros. No caso de Sócio administrador, a remuneração decorrente do cargo de administração será devida até o dia em que este deixar de exercer suas funções.

Em consequência das alterações mencionadas, os sócios resolvem CONSOLIDAR o Contrato Social com a seguinte redação:

CONTRATO SOCIAL CONSOLIDADO

"E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA"
CNPJ 31.412.442/0001-79
NIRE 35235338841

CAPÍTULO I- DENOMINAÇÃO E SEDE

Cláusula 1°- A sociedade tem denominação de "**E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA.**"

Cláusula 2°- A sede da Sociedade fica estabelecida na **Avenida Paes de Barros, n°3333, Andar 1, Parque da Mooca, São Paulo/SP, CEP 03149-100.**

Parágrafo único- A Sociedade poderá abrir, manter e fechar, a qualquer tempo, estabelecimentos, filiais ou escritórios de representação, em todo o território nacional ou no exterior.

CAPÍTULO II- OBJETO SOCIAL E DURAÇÃO

Cláusula 3°- O objeto social da Sociedade compreende:

a) A prestação de serviços de assessoria, consultoria, orientação, assistência operacional, acompanhamento, gerência e fiscalização de projeto em tecnologia da informação;
b) O desenvolvimento e licenciamento de programas de computador customizáveis;
c) O desenvolvimento e licenciamento de programas de computador não-customizáveis;

Cláusula 4°- A Sociedade iniciou suas atividades na data de 01/08/2018, e seu prazo de duração é indeterminado.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

Parágrafo Único: A Sociedade poderá ser dissolvida a qualquer tempo, por deliberação dos sócios em reunião especificamente convocada para este fim, observando-se o quórum e demais disposições legais da espécie.

CAPÍTULO III- CAPITAL SOCIAL

Cláusula 5°- O Capital da Sociedade é de **R$ 10.000,00 (dez mil reais)** dividido em 1.000 (mil) quotas, com o valor de R$ 10,00 (dez reais) cada uma, já inteiramente subscrito e integralizado, em moeda corrente nacional, assim distribuído para o sócio quotista:

SÓCIOS	QUOTAS	R$	%
LUCIANO APARECIDO DE SOUZA	850	R$ 8.500,00	85
RAPHAEL NOVAES SOUSA BERTANI	150	R$ 1.500,00	15
TOTAL	**1000**	**R$ 10.000,00**	**100**

§ 1º- Conforme disposto no artigo 1.052, da Lei 10.406 de 10 de janeiro de 2002, a responsabilidade de cada sócio será restrita ao valor de suas quotas, respondendo todos, solidariamente, pela integralização do Capital Social.

§ 2º- As quotas sociais são indivisíveis, reconhecendo-se apenas um proprietário para cada quota.

§ 3º- Cada quota social corresponde a um voto nas reuniões/assembleias de sócios, e demais deliberações sociais.

CAPÍTULO IV- ADMINISTRAÇÃO DA SOCIEDADE

Cláusula 6°- Os negócios serão geridos, **isoladamente**, por **LUCIANO APARECIDO DE SOUZA,** com amplos e gerais poderes, podendo representar a Sociedade ativa e passivamente, judicial e extrajudicialmente, respeitados os critérios estabelecidos nessa Cláusula e seus parágrafos, podendo os sócios a qualquer tempo deliberar acerca da nomeação de administradores não sócios, nomeados no Contrato Social ou em ato separado.

§ 1º- Os administradores terão as funções, cargos, prazos de mandato e poderes que lhes forem atribuídos no ato de sua designação, sendo que, no silêncio, ficarão investidos de poderes gerais de administração e seus mandatos terão prazo indeterminado, sendo ainda permitida a recondução.

§ 2º- A remuneração dos administradores poderá ser estabelecida no ato de sua designação, podendo a deliberação estabelecer que os administradores não perceberão qualquer remuneração.

§ 3º- A Sociedade não terá Conselho Fiscal instalado.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

Cláusula 7°- Compete aos administradores, a gestão dos negócios sociais em geral e a prática de todos os atos necessários ou convenientes para esse fim, representando a Sociedade ativa e passivamente, judicial e extrajudicialmente, respeitadas as restrições e limites impostos por lei, por este Contrato Social, e no ato de designação.

§ 1º- Os atos dispostos na Cláusula 10ª, quando atribuídos ou de competência de administradores, somente poderão ser por estes praticados após a expressa autorização dos Sócios, proveniente da competente deliberação social.

§ 2º- Além das hipóteses dispostas na Cláusula 10ª, os atos a seguir relacionados somente poderão ser praticados pelos administradores após a expressa autorização dos Sócios, proveniente da competente deliberação social:

a) A compra, a venda, a locação, a cessão em comodato, ou qualquer outra forma de oneração, de bens do ativo fixo (ativo permanente ou ativo imobilizado), móveis ou imóveis, cujo o valor individual exceda a quantia de R$ 1.000.000,00 (um milhão de reais);

b) A declaração, a destinação e a distribuição de lucros;

c) A contratação de empréstimos ou financiamentos de valor que sejam superiores a R$ 1.000.000,00 (um milhão de reais);

d) A alienação, cessão ou oneração de participações societárias;

e) O pedido de recuperação judicial ou autofalência;

f) A incorporação, cisão, fusão, e a dissolução da sociedade;

g) A abertura de filiais e de escritórios de representação;

h) A constituição, a dissolução, ou a liquidação de sociedades, assim como o processamento das respectivas alterações contratuais, das quais esta sociedade seja sócia;

i) A celebração de contratos de transferência de tecnologia, de cessão de direitos de propriedade intelectual ou direitos de propriedade industrial; e,

j) A contratação de empregados, cuja remuneração mensal seja superior a 50 (cinquenta) salários mínimos;

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

§ 3º- A Sociedade poderá, a qualquer tempo, constituir mandatários ou procuradores, desde que estejam especificados no instrumento de procuração ou poderes, atos e a natureza das operações cuja prática está autorizada. As procurações terão prazo de validade de 24 (vinte e quatro) meses, salvo os mandatos judiciais que terão prazo indeterminado.

Cláusula 8°- São expressamente proibidos, sendo nulos e inoperantes com relação à Sociedade, os atos de qualquer dos Sócios, administradores, procuradores, prepostos ou empregados que a envolverem em obrigações, negócios ou operações estranhas ao objeto social, ou aparentemente conflitante com seus interesses, inclusive fianças, avais, endossos ou qualquer outra garantia em favor de terceiros. Aqueles que infringirem o disposto nesse parágrafo ficarão pessoal e ilimitadamente responsáveis pelos atos praticados e obrigações assumidas.

Parágrafo único- Desde que aprovados em reunião/assembleia de Sócios ou havendo anuência direta desses conforme parágrafo 8° da Cláusula 9ª deste Contrato exclui-se da proibição estabelecida nesta Cláusula: (i) a prestação de fiança em contratos de locação de imóveis de interesse da Sociedade; e (ii) e a prestação de garantias de quaisquer espécies, reais ou fidejussórias, em favor de Sociedades ligadas, coligadas, controladas ou controladoras, ou outras Sociedades pertencentes ao mesmo grupo econômico.

CAPÍTULO V- DELIBERAÇÕES SOCIETÁRIAS

Cláusula 9°- As deliberações de Sócios, quer previstas em lei ou no Contrato Social serão tornadas em reuniões/assembleias de Sócios, em alterações do Contrato Social ou outros atos deliberativos.

§ 1º- A reunião/assembleia de Sócios poderá ser dispensada nos casos previstos na lei ou neste Contrato Social, assim como no caso dos Sócios decidirem, por escrito, sobre a matéria a ela sujeita, observando-se o respectivo quórum de aprovação.

§ 2º- Qualquer Sócio poderá ser representado na deliberação por outro Sócio, por advogado ou por procurador com poderes específicos para aquela deliberação. Admite-se ainda o voto escrito, por carta, telegrama, fac-simile, correio eletrônico ou outra forma escrita, considerando-se presentes os Sócios que assim o transmitirem.

§ 3º- As reuniões/assembleias de Sócios serão convocadas por qualquer dos administradores, ou por qualquer dos Sócios, mediante correio eletrônico, telegrama, carta ou fac-simile, contendo comprovação de envio e recebimento, e deverá especificar o dia, hora e local, e as matérias a serem debatidas e deliberadas (ordem do dia). Fica dispensada a publicação a que dispõe o artigo 1.152 do Código Civil vigente para todas as convocações de todas as reuniões/ assembleias dos sócios.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

§ 4º- As reuniões/ assembleias de Sócios serão convocadas duas vezes, sendo a primeira com 8 (oito) dias de antecedência e a segunda com 5 (cinco) dias de antecedência, salvo quando (i) os Sócios compareçam espontaneamente à reunião/ assembleia, (ii) os Sócios deliberarem pela sua realização em caráter de urgência, ou (iii) todos os Sócios informarem em documento escrito sua ciência do local, data e hora da reunião/ assembleia.

§ 5º- A reunião/ assembleia instala-se com a presença dos Sócios que perfaçam a maioria absoluta do capital social, e será preferencialmente presidida por um dos administradores, ou a critério dos presentes por qualquer desses inclusive terceiros não-Sócios, eleito na ocasião. O presidente, por sua ver, designará o secretário.

§ 6º- Da reunião/ assembleia realizada será lavrada uma ata, que será levada a arquivamento perante o competente Registro Público de Empresa Mercantis.

§ 7º- Havendo empate, nova reunião/ assembleia para deliberar sobre a matéria controvertida, será convocada no prazo mínimo de 30 (trinta) dias, e permanecendo o impasse ou empate, e os Sócios não concordarem em submeter a decisão a um terceiro, caberá ao Poder Judiciário decidir, no interesse da Sociedade.

§ 8º- Dispensa- se na realização da reunião/ assembleia de sócios, para aprovação ou autorização de atos, negócios ou contratos, quando os Sócios detentores da participação societária suficiente para sua autorização comparecerem diretamente nesses atos, negócios ou contratos, na qualidade de anuentes.

Cláusula 10°- Fica estabelecido que os atos e matérias abaixo relacionados deverão ser aprovados conforme o quórum a seguir descrito:

I- Pela concordância dos Sócios que representem a maioria absoluta, a qual corresponde a qualquer quantia superior a 50% (cinquenta por cento) do Capital Social, serão autorizadas, definidas e/ou aprovadas:

a) As contas da administração, e respectivos demonstrativos financeiros e contábeis;

b) Exclusão de Sócio por justa causa;

c) Designação de administradores Sócios, quando feita em ato separado;

d) Destituição de administradores não Sócios, designados em ato separado ou no Contrato Social;

II- Pela concordância dos Sócios que representem 2/3 (dois terços) do Capital Social serão autorizadas, definidas e/o aprovadas;

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

a) Destituição de administradores Sócios, designados em ato separado ou no Contrato Social;

b) Designação de administradores não-Sócios, quando feita em ato separado;

c) Pedido de recuperação judicial da Sociedade, ou de autofalência;

d) Demais hipóteses do § 3° da Cláusula 7ª que não estejam expressamente previsto nesta Cláusula 10ª.

III- Pela concordância dos Sócios que representem 3/ 4 (três quartos) do Capital Social serão autorizadas, definidas e/ ou aprovadas:

a) Exclusão de Sócio da Sociedade, independentemente de justa causa, mediante liquidação de sua participação, e consequente redução do Capital Social;

b) Aumento ou redução do Capital Social;

c) Alteração do Contrato Social;

d) Admissão de novos Sócios, ou a autorização para transferência, cessão ou alienação de quotas sociais para terceiros estranhos aos quadros sociais;

e) Dissolução e liquidação da Sociedade, ou a cessação do estado de liquidação;

f) Fusão, cisão ou incorporação da Sociedade;

g) Transformação da Sociedade em outro tipo societário.

Parágrafo único- Os Sócios manifestam seu entendimento e vontade de que todas as deliberações sociais sejam, desde permitido em lei, aprovadas pela concordância da maioria absoluta do capital social, ficando estabelecidos que os quóruns de aprovação mencionados nos incisos II e III retro serão automaticamente reduzidos por ocasião de superveniência de texto ou disposição legal que reduza esses respectivos limites.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

CAPÍTULO VI- EXERCÍCIO SOCIAL, DEMONSTRAÇÕES FINANCEIRAS E DESTINAÇÃO DE RESULTADOS

Cláusula 11°- O exercício social coincidirá com o ano civil, sendo que a 31 de dezembro de cada ano, os administradores farão elaborar o balanço patrimonial, a demonstração do resultado e as demais demonstrações contábeis e financeiras exigidas em lei, e em conformidade com os princípios de contabilidade aceitos no país.

§ 1º- A Sociedade levantará balancetes mensais de apuração de resultados, e salvo no caso de expressa deliberação dos Sócios em contrário, realizará mensalmente a distribuição de lucros e dividendos.

§ 2º- As demonstrações financeiras e contábeis consolidadas, relativas ao exercício social, serão apresentadas aos Sócios até o dia 31 de março do ano seguinte ao do exercício, devendo aos Sócios reunir-se para deliberar sobre sua aprovação até o dia 30 de abril do mesmo ano.

Cláusula 12°- Os lucros apurados serão distribuídos entre os Sócios nas proporções definidas em acordo ou deliberação de sócios, e na omissão ou inexistência de deliberação específica, serão distribuídos na proporção de cada respectiva participação, ou, se assim convier, serão escriturados na conta de lucros suspensos da sociedade.

CAPÍTULO VII- DIREITO DE PREFERÊNCIA E ADMISSÃO DE TERCEIROS NA SOCIEDADE

Cláusula 13°- As quotas da Sociedade não poderão ser cedidas ou transferidas para terceiros sem o expresso consentimento dos Sócios, cabendo, em igualdade de condições, o direito de preferência aos Sócios que queiram adquiri-las.

§ 1º- A admissão de terceiros na Sociedade será aprovada em deliberação de Sócios, ficando expressamente ajustado que sem a concordância dos Sócios que representem 75% (setenta e cinco por cento) do capital social, nenhum terceiro será admitido na Sociedade, hipótese na qual as quotas do Sócio retirante serão obrigatoriamente liquidadas com base na situação patrimonial da Sociedade, e nas normas legais em vigor.

§ 2º- Aplica-se o disposto no parágrafo anterior no caso de falecimento de Sócio, de forma que seus herdeiros e sucessores somente serão admitidos na Sociedade após competente deliberação de Sócios, exercendo o inventariante do Espólio, devidamente constituído, o direito de voto das quotas do Sócio falecido.

§ 3º- O Sócio que quiser transferir suas quotas de Capital, ou parte delas, comunicará por escrito os demais Sócios sua intenção, indicando o nome do pretendente, o preço ajustado, o prazo e a forma de pagamento.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

§ 4º-Se ao término de 30 (trinta) dias contados do recebimento do aviso aos demais Sócios não interessar a aquisição das quotas oferecidas, realizar-se á dentro de 15 (quinze) dias a reunião/ assembleia de Sócios para deliberação sobre admissão do terceiro indicado. A ausência de deliberação pressupõe recusa à admissão do terceiro,

§ 5º- Os Sócios quotistas obrigam-se, por si e por seus sucessores, a respeitar o direito de preferência e limites à admissão de terceiros dispostos nesta Cláusula, ainda que as quotas sociais por eles detidas venham a ser conferidas, a título de integralização de Capital, a outra Sociedade.

CAPÍTULO VIII- DISSOLUÇÃO E LIQUIDAÇÃO DE SOCIEDADE

Cláusula 14°- Quando a Sociedade, representada por mais da metade do capital social, entender que um ou mais sócios estiverem colocando em risco a continuidade da Sociedade, em virtude de atos inegável gravidade, estes serão excluídos por justa causa da Sociedade, mediante alteração do contrato social.

Parágrafo único: Também será excluído o Sócio, de pleno direito

a) Por decisão judicial;

b) Que cometer falta grave no cumprimento de suas obrigações ou ainda por incapacidade superveniente.

Cláusula 15°- Em caso de dissolução da Sociedade, o liquidante será indicado em deliberação de Sócios, e os haveres da Sociedade serão empregados na quitação de suas obrigações, sendo o remanescente, se houver, rateado entre os Sócios na proporção das respectivas participações no capital social.

Cláusula 16°- A Sociedade não se dissolverá por morte, falência, exclusão dissidência ou retirada de qualquer dos Sócios, prosseguindo com os Sócios remanescentes, a menos que estes, em deliberação de Sócios, resolvam extingui-la.

§ 1º- As quotas sociais do Sócio falecido, falido, em recuperação judicial, excluído, dissidente ou retirante serão liquidadas, com base no respectivo valor patrimonial apurado em balanço especialmente levantado em até 30 (trinta) dias, para este fim. O pagamento será realizado no maior prazo permitido por lei.

§ 2º- Os lucros, se existentes, do Sócio falecido, falido, em recuperação judicial, excluído, dissidente ou retirante, serão apurados, devendo ser quitados em uma parcela inicial de 10% do preço apurado e o saldo em 12 parcelas mensais, iguais, não reajustadas e sem incidência de juros. No caso de Sócio administrador, a remuneração decorrente do cargo de administração será devida até o dia em que este deixar de exercer suas funções.

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

CAPÍTULO IX- REGÊNCIA, SUCESSORES E FORO

Cláusula 17°- A Sociedade será regida pelo disposto neste Contrato Social, e pelo estabelecido nos artigos 1.052 e 1.087 da Lei 10.406 de 10 de janeiro de 2002, aplicando-se, nos casos omissos, supletivamente, as normas que regulamentam o funcionamento das Sociedades Empresárias.

Cláusula 18°- O presente Contrato Social obriga também todos os sucessores dos Sócios, a título singular e universal.

Cláusula 19°- Fica eleito o Foro da Comarca de São Paulo, como competente para dirimir as dúvidas e/ ou controvérsias oriundas deste Contrato Social.

São Paulo, 13 de maio de 2024.

LUCIANO APARECIDO DE SOUZA

RAPHAEL NOVAES SOUSA BERTANI

D4Sign 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

12 páginas - Datas e horários baseados em Brasília, Brasil
Sincronizado com o NTP.br e Observatório Nacional (ON)
Certificado de assinaturas gerado em 20 de June de 2024, 12:18:23

CONTRATO SOCIAL pdf

Código do documento 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7

Assinaturas

LUCIANO APARECIDO DE SOUZA
legalizacao@doccontabilidade.com.br
Assinou

RAPHAEL NOVAES SOUSA BERTANI
legalizacao@doccontabilidade.com.br
Assinou



Eventos do documento

22 May 2024, 20:22:08
Documento 42675b97-02c7-4c9d-9bc7-17c6d7f0cbb7 **criado** por GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). Email:gabrielafreitas.juridico@gmail.com. - DATE_ATOM: 2024-05-22T20:22:08-03:00

22 May 2024, 20:23:08
Assinaturas **iniciadas** por GABRIELA DOS SANTOS FREITAS (c32387c0-f313-4c66-a4d6-c89757879c3f). Email: gabrielafreitas.juridico@gmail.com. - DATE_ATOM: 2024-05-22T20:23:08-03:00

11 Jun 2024, 16:05:57
ASSINATURA PRESENCIAL - RAPHAEL NOVAES SOUSA BERTANI **Assinou -** Email: legalizacao@doccontabilidade.com.br (não verificado) - IP: 177.138.167.138 (177-138-167-138.dsl.telesp.net.br porta: 23748) - Geolocalização: -23.7278065 -46.5682041 - Documento de identificação informado: 296.984.498-25 - DATE_ATOM: 2024-06-11T16:05:57-03:00

18 Jun 2024, 18:23:24
ASSINATURA PRESENCIAL - LUCIANO APARECIDO DE SOUZA **Assinou** - Email: legalizacao@doccontabilidade.com.br (não verificado) - IP: 172.225.83.33 (a172-225-83-33.deploy.static.akamaitechnologies.com porta: 42142) - Geolocalização: -23.587331284329757 -46.57216172824515 - Documento de identificação informado: 286.551.298-36 - DATE_ATOM: 2024-06-18T18:23:24-03:00

Hash do documento original

(SHA256):56553e36c17c7aa18f6acedc91b61532156da681db507f5cd3640b5943dd626b
(SHA512):91a7a1af814e1e5dd4b059a780c521d9893490a68d037a58dbc0be809524630988cbb674175a7b88f4cc9c29a825951af8e9bcc7395f43c77e3745733f8a8277

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

Esse log pertence **única** e **exclusivamente** aos documentos de HASH acima

Esse documento está assinado e certificado pela D4Sign

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

JUCESP

GOVERNO DO ESTADO DE SÃO PAULO

DECLARAÇÃO DE AUTENTICIDADE

Eu **DOMINGOS ORESTES CHIOMENTO** com inscrição ativa na(o) Conselho Regional de Contabilidade de São Paulo sob o nº **1SP032010**, expedida em **06/04/1994**, inscrito no CPF nº 00410993891, DECLARO, sob as penas da Lei penal e, sem prejuízo das sanções administrativas e cíveis, que este documento é autêntico e condiz com o original. Documentos apresentados:

Arquivo de Outras Cláusulas

Arquivo de Outros (Docs. privados)

São Paulo, 20/06/2024.

_____

DOMINGOS ORESTES CHIOMENTO

JUCESP Junta Comercial do Estado de São Paulo

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

JUCESP

GOVERNO DO ESTADO DE SÃO PAULO

TERMO DE ANÁLISE E DECISÃO.

Defiro a (s) solicitação (ões), sob o (s) protocolo (s) **SPJ2400083023** de Alteração de Outras Cláusulas e Consolidação da Matriz da empresa **E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA.**.

Assina o presente termo de decisão, mediante certificado digital, o Julgador **Carla Fabiana da Silva**.

Junta Comercial do Estado de São Paulo, 25/06/2024.

Carla Fabiana da Silva, CPF: 29352502817

Este documento foi assinado digitalmente por Carla Fabiana da Silva e é parte integrante sob o protocolo Nº SPJ2400083023.

JUCESP Junta Comercial do Estado de São Paulo

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

JUCESP

GOVERNO DO ESTADO DE SÃO PAULO

TERMO DE AUTENTICAÇÃO E REGISTRO

Autentico que o ato, assinado digitalmente, pertencente a empresa **E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. de NIRE 35235338841**, protocolizado sob o número **SPJ2400083023** em **25/06/2024**, encontra-se registrado na JUCESP sob o número **1157233247**.

Assina o registro a Secretária-Geral Maria Cristina Frei.

A autenticidade do presente documento, bem como o arquivo na forma eletrônica, poderão ser verificados no sítio eletrônico: www.jucesp.sp.gov.br, mediante a indicação do número de autenticidade disponível na capa da certidão de inteiro teor.

Junta Comercial do Estado de São Paulo, 25/06/2024.

Maria Cristina Frei, CPF: 14804696881

R. Guaicurus, 1394 | CEP 05033-060 | Lapa, São Paulo – SP
Fone: (11) 3468-3080

JUCESP Junta Comercial do Estado de São Paulo

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

PROTOCOLO DE ASSINATURAS

O documento acima foi proposto para assinatura digital na plataforma VRE Digital.

Os nomes indicados para assinatura, bem como seus status em 22/05/2024 são:

Nome Completo	CPF	Data e hora	Certificado
DOCS PDFA.pdf			
DOMINGOS ORESTES CHIOMENTO	00410993891	20/06/24 12:26	AC Instituto Fenacon RFB G3 / PDF-1.7
CRC Domingos pdfa.pdf			
DOMINGOS ORESTES CHIOMENTO	00410993891	20/06/24 12:26	AC Instituto Fenacon RFB G3 / PDF-1.7
Arquivo de Declaração de Autenticidade.pdf			
DOMINGOS ORESTES CHIOMENTO	00410993891	20/06/24 12:26	AC Instituto Fenacon RFB G3 / PDF-1.4

Este documento é referência das assinaturas eletrônicas realizada nas documentações do protocolo Nº SPJ2400083023

JUCESP Junta Comercial do Estado de São Paulo

Certifico o registro sob o nº 1.157.233/24-7 em 25/06/2024 da empresa E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA., NIRE nº 35235338841, protocolado sob o nº SPJ2400083023. Autenticação: validar a autenticidade do registro em http://www.jucesp.sp.gov.br/ com o número do mesmo. MARIA CRISTINA FREI - Secretária Geral. Esta cópia foi autenticada digitalmente e assinada em 24/07/2024 por MARIA CRISTINA FREI – Secretária Geral. Autenticação: 243342340. A JUCESP garante a autenticidade do registro e da Certidão de Inteiro Teor quando visualizado diretamente no portal www.jucesponline.sp.gov.br.

Exhibit C.I – First Prong – Substantial Merit and National Importance

E·IT
TECHNOLOGIES

BUSINESS PLAN



2026



Name: Luciano Aparecido de Souza
Phone: +55 (11) 98174-6761
E-mail: luapbr@gmail.com
Position: Founder, General Manager and Principal SAP Solution Architect

Prepared by:
Nextus Plan

Contents

1.0 EXECUTIVE SUMMARY 4

1.1 Nature and Scope of the Business 5

1.2 Mr. Luciano Aparecido de Souza's Expertise 7

2.0 THE COMPANY 8

2.1 Company's Target 10

2.2 Needs for the Company's Services 12

2.3 Company's Expansion 14

2.4 Company's Economic Benefits 16

2.4.1 Financial Highlights Chart 17

2.4.2 Federal, State and Payroll Taxes Chart 18

2.5 Summary of Investment 18

2.5.1 Startup Requirements Table 20

2.5.2 Startup Requirements Chart 20

3.0 COMPANY'S SERVICES 21

4.0 INDUSTRY OVERVIEW 23

4.1 Industry Analysis 24

4.1.1 Products and Services 25

4.2 Major Market Segmentation 26

4.3 Business Location 27

5.0 STRATEGY AND IMPLEMENTATION 29

5.1 Swot Analysis 29

5.1.1 Strengths 29

5.1.2 Weaknesses 30

5.1.3 Opportunities 30

5.1.4 Threats 31

5.2 Website and Digital Marketing 31

5.3 Sales Strategy 33

5.4 Sales Forecast 35

5.4.2 Annual Sales Forecast Table 37

5.4.3 Annual Sales Chart 38

6.0 MANAGEMENT STRUCTURE 38

6.1 Staffing Requirements 38

6.2 Annual Personnel Plan Table 41

6.3 Five-Year Personnel Plan Table 41

6.4 Organizational Chart – Year 5 42
6.5 Duties and Responsibilities 43
7.0 FINANCIAL SUMMARY 45
7.1 Break-even Analysis 45
7.1.1 Break-even Analysis Chart 46
7.2 Profit and Loss Assumptions 46
7.2.1 Annual Profit and Loss Table 47
7.2.2 Annual Expenses x Sales Chart 48
7.2.3 Annual Profit Chart 48
7.3 Cash Flow Assumptions 49
7.3.1 Annual Cash Flow Table 50
7.3.2 Annual Net Cash Flow and Cash Balance Chart 51
7.4 Balance Sheet Assumptions 51
7.4.1 Annual Balance Sheet Table 52
8.0 MR. LUCIANO APARECIDO DE SOUZA'S NATIONAL-LEVEL IMPACT 53
9.0 INDIRECT JOBS CREATION - ECONOMIC POLICY INSTITUTE 56
9.1 Distressed Communities 57
APPENDIX 1
Monthly Sales Forecast Table 1
Monthly Personnel Plan Table 2
Monthly Profit and Loss Table 3
Monthly Cash Flow Table 4
Monthly Balance Sheet Table 5
REFERENCES 6

1.0 Executive Summary

E-IT Technologies will be established in **Austin, Texas**, by **Mr. Luciano Aparecido de Souza** as a specialized technology solutions company focused on SAP-based enterprise systems optimization, electronic invoicing automation, regulatory compliance solutions, and systems integration. The company will initially operate in Texas, with a structured plan to expand its services across the United States in line with market demand and client acquisition.

E-IT Technologies will provide solutions that support logistics optimization, procurement automation, financial process integration, electronic invoicing compliance, and enterprise system modernization for medium to large organizations operating in industries with complex supply chains and regulatory requirements. Target sectors include manufacturing, energy, chemicals, pharmaceuticals, agribusiness, retail, and industrial services.

The company's service portfolio is designed to help organizations increase operational efficiency, reduce manual processing, strengthen compliance controls, and improve data reliability within enterprise resource planning environments, particularly SAP-based systems. By delivering modular, clean-core compliant extensions and secure integration architectures, E-IT Technologies will enable clients to modernize their operations without disrupting core enterprise platforms.

Mr. Luciano Aparecido de Souza is a Senior SAP Solution Architect and technology entrepreneur with more than 22 years of international experience in enterprise systems, logistics automation, indirect tax compliance, and large-scale SAP implementations. He is the founder and CEO of E-IT Technologies in Brazil, a company that has delivered SAP add-on products and automation solutions to multinational clients across Latin America. His professional background includes leadership roles and project delivery for organizations such as Schneider Electric, GE Energy, Voith, Prysmian, and ContourGlobal, with extensive experience in cross-border system integrations, regulatory compliance, and enterprise-scale SAP environments.

The U.S. operation of E-IT Technologies builds directly upon this established technical expertise and proven delivery history, adapting mature solutions originally developed for regulated markets to meet the specific operational and compliance requirements of U.S.-based enterprises.

National Priorities and U.S. Economic Needs

The proposed business supports several U.S. national priorities related to digital transformation, supply chain resilience, regulatory compliance, and enterprise modernization. As organizations across the United States face increasing complexity in logistics, trade compliance, and financial reporting, there is a growing demand for reliable enterprise system integrations and automation solutions that reduce risk and improve operational transparency.

E-IT Technologies' activities align with key U.S. federal strategies and policy initiatives, including:

- **National Strategy for Advanced Manufacturing:** Supports the adoption of advanced digital systems to strengthen manufacturing competitiveness and supply chain resilience.[i]
- **U.S. Supply Chain Resilience Initiatives:** Emphasize modernization of logistics systems, improved data visibility, and digital integration across critical industries.[ii]
- **Federal Data Strategy:** Promotes the secure, reliable, and effective use of data to support decision-making in both public and private sectors.[iii]
- **Federal Electronic Invoicing Initiatives:** OMB Memorandum M-15-19 directed federal agencies to transition to electronic invoicing for federal procurement, and the U.S. Department of the Treasury operates the Invoice Processing Platform (IPP), a centralized electronic invoicing system for government agencies and their suppliers.[iv]
- **National Cybersecurity Strategy**: Highlights the importance of secure system architectures, data governance, and resilient digital infrastructure for economic stability.[v]
- **U.S. Bureau of Labor Statistics – Technology and Systems Occupations Outlook:** Identifies sustained demand for enterprise systems specialists, integration engineers, and technology professionals supporting digital transformation.[vi]

These national strategies underscore the importance of:

- Strengthening supply chain efficiency and operational resilience
- Modernizing enterprise systems and compliance processes
- Enhancing data reliability and system integration security
- Supporting workforce development in enterprise technology and systems architecture
- Improving U.S. competitiveness across industrial and commercial sectors

By delivering specialized SAP-based automation, compliance, and integration solutions, E-IT Technologies is positioned to contribute directly to these objectives, supporting U.S. organizations as they modernize their operations and adapt to evolving regulatory and economic conditions.

1.1 Nature and Scope of the Business

E-IT Technologies will operate as a specialized enterprise technology solutions company serving organizations across the United States, with initial operations based in Austin, Texas, and a structured plan for expansion into additional U.S. markets. The company's scope of activities is centered on the design, implementation, integration, and continuous optimization of SAP-based enterprise systems, with a strong emphasis on logistics, supply chain management, electronic invoicing automation, regulatory compliance, and scalable system extensions.

The company will support medium to large enterprises operating in industries characterized by complex supply chains, high transaction volumes, and stringent regulatory requirements, including manufacturing, energy, chemicals, pharmaceuticals, agribusiness, retail, and industrial services. These organizations rely heavily on ERP platforms such as SAP to manage procurement, logistics, financial operations, tax compliance, and cross-border transactions, creating a strong demand for specialized, flexible, and cost-effective technology solutions.

E-IT Technologies will address these needs through the following five core service areas:

• **SAP Consulting & Process Optimization Services:** Provision of specialized consulting services focused on the analysis, design, and optimization of SAP-based logistics, procurement, and supply chain processes. These services include system assessment, process redesign, configuration support, and operational improvement initiatives aimed at increasing efficiency, reducing costs, and enhancing data visibility across enterprise environments.

• **ERP Integration & Automation Solutions:** Development and implementation of integration architectures connecting SAP systems with banking platforms, government systems, external partners, and third-party applications. Services include API-based integrations, middleware configuration, event-driven processes, and automation frameworks designed to improve data flow, reduce manual intervention, and ensure operational reliability across complex business ecosystems.

• **Electronic Invoicing & Compliance Solutions:** Design and deployment of advanced automation solutions for electronic invoicing, inbound document processing, and regulatory compliance. These services focus on XML validation, exception management, audit controls, and seamless ERP integration, enabling organizations to meet evolving regulatory requirements while improving accuracy, traceability, and operational efficiency.

• **Custom SAP Extensions & Application Development:** Development of clean-core compliant SAP extensions and enterprise applications using technologies such as ABAP, SAPUI5, Fiori, and SAP Business Technology Platform (BTP). These solutions are designed to extend ERP capabilities, enhance user experience, and support business-specific requirements while preserving system stability, scalability, and long-term maintainability.

• **SaaS and Subscription-Based Solutions:** Gradual introduction of proprietary software solutions adapted from the company's existing platforms, including electronic invoicing and logistics automation tools, delivered through cloud-based and subscription-based models. These offerings will provide clients with scalable, continuously updated solutions, generating recurring revenue streams while supporting long-term client engagement and system performance.

E-IT Technologies will operate through a hybrid delivery model that combines project-based consulting services with scalable software solutions, allowing the company to support both immediate operational needs and long-term digital transformation strategies. By positioning itself as a provider of complementary ERP solutions, rather than a replacement for core systems,

the company will deliver targeted, high-impact improvements with faster implementation timelines and greater flexibility compared to larger, standardized platforms.

Through this approach, E-IT Technologies aims to enable organizations to modernize enterprise systems, automate critical processes, strengthen regulatory compliance, and enhance operational efficiency, contributing to improved competitiveness and resilience across key sectors of the U.S. economy.

1.2 Mr. Luciano Aparecido de Souza's Expertise

Mr. Luciano Aparecido de Souza is a **Senior SAP Solution and Product Architect** with more than **22 years of experience** in enterprise systems, logistics automation, electronic invoicing, regulatory compliance, and large-scale SAP implementations. His professional background combines deep technical expertise with hands-on leadership in the design, development, and delivery of enterprise-grade solutions for organizations operating in highly regulated and complex operational environments.

Mr. Souza holds a **Bachelor's degree in Business Administration and Foreign Trade** and an **MBA in Logistics** from Fundação Getulio Vargas (FGV), one of Brazil's leading academic institutions. His academic training provided a strong foundation in supply chain management, procurement, international trade, and operational planning, which he later complemented with extensive technical specialization in SAP ERP systems.

Throughout his career, Mr. Souza has developed advanced expertise in **SAP R/3, ECC, and S/4HANA-related architectures**, with a primary focus on logistics (SAP MM), financial integrations, indirect tax compliance, and cross-border transaction automation. He has led and executed SAP projects across multiple industries, including automotive, energy, manufacturing, chemicals, pharmaceuticals, retail, food production, and industrial engineering, supporting organizations with complex supply chains and high transaction volumes.

In 2010, Mr. Souza co-founded E-IT Technologies in Brazil, where he has served as CEO and technical lead for more than 15 years. Under his leadership, the company designed and commercialized proprietary SAP add-on solutions, including:

- **E-GT (Enhanced Global Trade)**, a solution for automating and controlling foreign trade processes within SAP environments
- **E-GR (Enhanced Goods Receipt)**, an automation platform for inbound electronic invoicing and XML validation, significantly reducing manual processing and operational delays
- **E-FCI**, a compliance solution supporting fiscal calculation and reporting requirements based on SAP ECC data

These solutions have been successfully deployed across multiple countries in Latin America, supporting logistics control, tax calculation, cost settlement, customs integration, and third-party billing processes for multinational clients.

In addition to his entrepreneurial activities, Mr. Souza has held senior consulting, project management, and solution architecture roles for global organizations such as **Schneider Electric, GE Energy, Voith, Prysmian, Apex Tool Group, ContourGlobal, and Osram**. In these roles, he was responsible for SAP rollouts, system re-implementations, data migration, localization, integration design, project governance, and user training, frequently operating in multinational and multilingual environments.

Mr. Souza's technical skill set includes the development of clean-core compliant SAP extensions, application modernization using ABAP, SAPUI5, Fiori Elements, and integration architectures leveraging middleware and API-based communication. He also has extensive experience designing solutions that interface SAP systems with government platforms, banking systems, and external business partners, ensuring operational reliability and regulatory compliance.

Collectively, Mr. Souza's background demonstrates a rare combination of deep SAP technical expertise, logistics and compliance domain knowledge, product development experience, and long-term entrepreneurial leadership. This expertise directly underpins the proposed U.S. business, positioning him to deliver specialized enterprise solutions that improve operational efficiency, compliance, and system integration for organizations across the United States.

2.0 The Company

E-IT Technologies will operate as a specialized enterprise technology solutions company serving organizations across the United States. To ensure a disciplined market entry and sustainable long-term growth, the company will adopt a phased workforce expansion strategy, beginning with a lean and cost-efficient operational structure in Year 1 and gradually scaling into a fully developed multidisciplinary team by Year 5.

This structured approach reflects the company's realistic revenue ramp-up, initial market positioning efforts, and progressive expansion of its service portfolio, ensuring alignment between operational capacity, client acquisition, and financial performance.

Organizational Structure – Year 1

During its first year of operations, E-IT Technologies will maintain a highly streamlined structure focused on business development, strategic positioning, and selective technical delivery. The company will prioritize client acquisition, relationship building, and initial project execution, while leveraging the founder's extensive expertise and, when necessary, external or outsourced technical support to maintain operational flexibility and cost control.

The Year 1 organizational structure will include:

- **1 General Manager and Principal SAP Solution Architect – Mr. Luciano Aparecido de Souza:** Responsible for overall business strategy, solution architecture leadership, client engagement, and supervision of all service delivery activities. Mr. Souza will also oversee

product direction, integration standards, and ensure alignment between technical execution and business objectives.

- **1 Business Development Manager:** Responsible for driving market entry initiatives, developing client relationships, identifying business opportunities, managing proposals, and establishing strategic partnerships within the U.S. market.
- **1 Administrative/Operations Assistant (Part-time):** Responsible for supporting administrative activities, scheduling, vendor coordination, documentation management, and day-to-day operational support functions.

In this initial phase, technical delivery functions, including SAP consulting, system integration, and development activities will be partially supported through the direct involvement of the founder and complemented, when necessary, by outsourced or project-based resources. This approach allows the company to maintain a lean cost structure while validating market demand and building a stable client base.

Organizational Structure – Year 5

By Year 5, E-IT Technologies will have expanded its operations significantly, supporting a diversified client portfolio across multiple U.S. regions. The company will scale its workforce to accommodate increased demand for consulting services, integration projects, and proprietary software solutions, while also strengthening internal operational capabilities and client support functions.

The planned Year 5 organizational structure will include:

- **1 General Manager and Principal SAP Solution Architect:** Continues to lead corporate strategy, oversee solution architecture governance, manage executive client relationships, and supervise overall business operations.
- **1 Business Development Manager:** Responsible for managing strategic accounts, expanding the company's market presence, and maintaining a consistent pipeline of new business opportunities.
- **1 Administrative/Operations Assistant (Part-time):** Supports administrative coordination, internal operations, and organizational efficiency as the company scales.
- **2 SAP/ERP Consultants:** Responsible for delivering SAP functional consulting services, supporting logistics, procurement, and financial integration processes, and managing client-facing solution implementations.
- **1 Sales & Marketing Specialist:** Responsible for strengthening the company's brand presence, managing digital marketing strategies, generating leads, and supporting business development efforts.

- **1 Project Manager:** Responsible for overseeing project execution, managing timelines and resources, ensuring delivery quality, and maintaining alignment with client expectations.
- **1 Technical Support Engineer:** Responsible for providing post-implementation support, monitoring system performance, resolving technical issues, and ensuring continuity of services.
- **1 Senior Solution Architect:** Responsible for designing advanced system architectures, leading complex integrations, and guiding the technical evolution of the company's solutions and product offerings.
- **1 HR/Recruitment Specialist:** Responsible for talent acquisition, onboarding, workforce planning, and ensuring compliance with employment regulations as the company grows.
- **1 Customer Success Manager:** Responsible for maintaining client relationships, ensuring satisfaction, supporting retention strategies, and identifying opportunities for recurring services and upselling.
- **1 Finance/Accounting Specialist:** Responsible for financial reporting, budgeting, tax coordination, and overall financial control, supporting the company's increasing operational complexity.

Organizational Scalability and Strategic Alignment

This phased organizational structure allows E-IT Technologies to scale in a controlled and sustainable manner, aligning workforce expansion with revenue growth and market demand. The company's approach prioritizes operational efficiency in the early stages, followed by strategic hiring to support service diversification, recurring revenue models, and long-term client engagement.

By maintaining strong leadership at the executive level, supported by specialized technical, operational, and commercial roles, E-IT Technologies will be well positioned to deliver high-quality, scalable, and compliant enterprise solutions. This structure supports the company's long-term objective of becoming a trusted partner for organizations seeking to modernize ERP environments, automate critical processes, and enhance operational performance across the U.S. market.

2.1 Company's Target

E-IT Technologies will focus on serving organizations that operate in complex, highly regulated, and transaction-intensive environments, where enterprise systems must support logistics execution, regulatory compliance, financial integration, and reliable data exchange with business partners and government platforms.

The company's services are designed to address challenges related to ERP process gaps, electronic document automation, logistics and supply chain integration, cross-border

operations, and system modernization, particularly for organizations that rely on SAP and other enterprise platforms to manage critical business processes.

Target Customers

E-IT Technologies' target customers include:

- **Manufacturing, Industrial, and Automotive Companies:** Medium to large manufacturers operating complex procurement, inventory, production, and distribution processes. These organizations require SAP-based solutions that improve logistics execution, automate inbound and outbound document flows, ensure tax and regulatory compliance, and integrate operations across multiple plants, entities, and countries.
- **Energy, Utilities, and Infrastructure Operators:** Companies in the energy and infrastructure sectors with distributed operations, high transaction volumes, and strict compliance requirements. E-IT Technologies will support these organizations through SAP integrations, process automation, and system extensions that improve operational visibility, reliability, and regulatory adherence.
- **Chemical, Pharmaceutical, and Life Sciences Companies:** Organizations operating under strict regulatory frameworks and complex supply chains, requiring accurate tracking of materials, automated goods receipt, integration with external partners, and reliable system controls to support compliance and operational continuity.
- **Retail, Distribution, and Consumer Goods Companies:** Enterprises managing high-volume purchasing, inventory movements, and supplier interactions that depend on efficient SAP logistics processes, electronic invoicing automation, and integration with third-party systems to reduce delays and operational friction.
- **Organizations with International Trade and Cross-Border Operations:** Companies involved in import, export, and global trade activities that require specialized SAP solutions for customs integration, electronic documentation, tax compliance, and cross-country process harmonization.
- **Mid-Sized Enterprises and SAP-Dependent Organizations:** Companies that rely heavily on SAP ERP systems but lack internal resources to design, extend, or modernize their environments. These organizations benefit from E-IT Technologies' ability to deliver cost-effective, clean-core compliant extensions, automation solutions, and integration frameworks without the complexity and overhead of large consulting firms.

Strategic Positioning

E-IT Technologies will serve clients across these sectors by delivering specialized, complementary enterprise solutions that extend and enhance core ERP platforms rather than replacing them. The company's approach focuses on:

- Closing functional and technical gaps in SAP logistics, finance integration, and compliance processes
- Automating electronic document flows and system-to-system integrations
- Improving operational efficiency and data reliability across supply chain and financial processes
- Supporting regulatory compliance and audit readiness in highly regulated industries

By targeting organizations with complex operational requirements and underserved system needs, E-IT Technologies positions itself as a high-value, specialized partner capable of delivering measurable improvements in efficiency, compliance, and enterprise system performance across the U.S. market.

2.2 Needs for the Company's Services

The demand for E-IT Technologies' services is driven by structural changes in the U.S. economic, technological, and regulatory landscape, particularly affecting organizations that rely on enterprise systems, complex supply chains, and regulated transactional processes. Companies across manufacturing, energy, chemicals, pharmaceuticals, retail, and logistics are under increasing pressure to modernize ERP environments, automate document-intensive operations, and ensure compliance while maintaining operational efficiency.

Several key factors are driving this demand:

Rising Operational and Supply Chain Complexity

U.S. companies are managing increasingly complex, multi-entity, and cross-border operations that require tight integration between procurement, inventory, logistics, finance, and external partners. Many organizations continue to operate fragmented or legacy ERP environments that limit visibility, slow decision-making, and increase operational risk.[vii]

Regulatory, Tax, and Compliance Pressures

Organizations operating in the U.S. face increasing regulatory scrutiny related to financial controls, electronic records, auditability, and cross-border trade compliance. ERP systems must support accurate transaction tracking, document automation, and integration with external regulatory and business platforms.

The U.S. Government Accountability Office (GAO) and Internal Revenue Service (IRS) have highlighted the growing importance of reliable digital records and system controls to support compliance and audit readiness.[viii]

Government-Led Advance of Electronic Invoicing

The United States is moving steadily toward broader adoption of electronic invoicing. The Office of Management and Budget (OMB) Memorandum M-15-19 (2015) required federal agencies to

process invoices electronically by the end of fiscal year 2018, noting that only about 40 percent of the federal government's approximately 19 million annual invoices were processed electronically at the time. The U.S. Department of the Treasury supports this transition through the Invoice Processing Platform (IPP), a centralized e-invoicing system offered at no cost to federal agencies and their vendors.[ix]

In the business-to-business segment, the Business Payments Coalition and the Federal Reserve conducted the E-invoice Exchange Market Pilot (2021-2022), in which 73 organizations tested a federated exchange framework for electronic invoices.[x] The pilot resulted in the creation of the Digital Business Networks Alliance (DBNAlliance), the legal entity that operates the open e-invoice exchange network in the United States.[xi] In parallel, the Internal Revenue Service lowered the mandatory electronic filing threshold from 250 to 10 information returns, effective for returns filed from 2024,[xii] and launched the Paperless Processing Initiative in 2023, reflecting a sustained federal movement toward digital tax administration.[xiii] According to a Federal Reserve Bank of Minneapolis white paper, U.S. businesses exchange approximately 25 billion invoices annually, and migrating from paper to electronic invoicing saves an estimated $4 to $8 per invoice, underscoring the efficiency gains available through broader adoption.[xiv]

Supply Chain Resilience and Automation Needs

Recent disruptions caused by global events, geopolitical instability, and market volatility have exposed weaknesses in supply chain visibility and responsiveness. U.S. companies are prioritizing digital supply chain integration, automation, and real-time data exchange to reduce risk and improve resilience.[xv]

Enterprise System Modernization and Clean-Core Strategies

As organizations migrate from legacy ERP systems to modern platforms such as SAP S/4HANA, there is growing demand for clean-core compliant extensions, modular add-ons, and cloud-based integrations that avoid excessive customization while preserving flexibility.

SAP itself highlights the importance of clean-core strategies and side-by-side extensions to ensure long-term system sustainability.[xvi]

Shortage of Skilled ERP and Integration Professionals

The U.S. labor market continues to experience a shortage of professionals with deep expertise in SAP logistics, ERP integration, and enterprise automation. According to Deloitte and Gartner, many organizations struggle to recruit and retain specialists capable of delivering complex ERP and integration projects.[xvii]

SME Demand for Scalable and Cost-Efficient ERP Solutions:

Small and mid-sized enterprises increasingly rely on ERP platforms such as SAP but often lack the internal resources to implement automation, integrations, and compliance enhancements.

The U.S. Small Business Administration (SBA) identifies digital transformation and process automation as key competitiveness factors for SMEs[xviii]

E-IT Technologies is well positioned to meet these market needs by delivering SAP-centered enterprise solutions, logistics and compliance automation, clean-core integrations, and scalable system extensions. These services help organizations reduce operational friction, improve regulatory compliance, strengthen supply chain resilience, and modernize enterprise environments in alignment with evolving U.S. economic and technological priorities.

2.3 Company's Expansion

E-IT Technologies will implement a structured and phased expansion strategy designed to scale its operations across the United States while maintaining technical depth, service quality, and operational sustainability. The company's growth plan prioritizes enterprise system modernization, SAP-centric solutions, compliance automation, and supply chain integration, in alignment with market demand and the founder's proven expertise.

The expansion strategy is structured into four progressive phases:

Phase 1 – Initial Operations and Market Entry (Year 1)

- Establish the company's headquarters in Austin, Texas, a strategic technology hub with strong access to enterprise clients, SAP-skilled professionals, and innovation ecosystems.
- Focus on the company's core service lines, including:
    - SAP functional consulting for logistics and finance integration
    - ERP process automation and clean-core compliant extensions
    - Electronic document automation and compliance-oriented solutions
    - System integration and cloud-based interoperability frameworks
- Build an initial lean team to support technical delivery, business development, and client onboarding, while leveraging international expertise from existing operations when appropriate.
- Target early contracts with manufacturing, energy, chemicals, pharmaceuticals, retail, and logistics-intensive companies, particularly organizations operating SAP environments with unmet integration or compliance needs.
- Establish brand presence in the U.S. market through direct sales efforts, networking, and strategic positioning as a specialized SAP add-on and integration partner.

Phase 2 – Service and Team Expansion (Years 2–3)

- Expand the consulting and technical team by hiring additional SAP functional consultants, ABAP developers, and integration engineers to support growing project volume.

- Strengthen system integration capabilities, including cloud-based extensions, API-driven architectures, and event-based integrations aligned with modern ERP strategies.
- Develop strategic partnerships with technology vendors, system integrators, and industry-focused firms to support larger and more complex enterprise projects.
- Introduce structured training and enablement services for client teams, focusing on SAP logistics processes, system governance, and operational automation.
- Increase marketing and business development capacity to expand the client base beyond Texas into other high-demand regions.

Phase 3 – National Market Penetration (Years 4–5)

- Expand service delivery nationwide by serving clients across multiple U.S. states, supported by remote delivery models and selective on-site engagement.
- Establish satellite offices or formal partnerships in regions with strong manufacturing, logistics, and industrial concentration, such as the Midwest, Southeast, and Northeast.
- Scale project management and support functions to manage multiple concurrent enterprise implementations and long-term support contracts.
- Build a portfolio of multi-year enterprise contracts, ensuring predictable and sustainable revenue streams.
- Strengthen client success and post-implementation support services to improve retention and long-term engagement.

Phase 4 – Innovation and Strategic Growth (Beyond Year 5)

- Invest in the development of proprietary SAP accelerators, integration frameworks, and automation components that reduce implementation time and cost.
- Explore opportunities to commercialize selected solutions as modular software offerings or subscription-based services, particularly for mid-sized enterprises.
- Expand collaboration with universities, technology hubs, and research institutions to support innovation in enterprise systems, automation, and digital supply chains.
- Position E-IT Technologies as a national reference for SAP extensions, logistics automation, and compliance-oriented enterprise solutions, supporting critical sectors of the U.S. economy.

This phased expansion approach allows E-IT Technologies to grow steadily while preserving its specialization in enterprise systems, SAP integration, and operational automation. By scaling services, talent, and geographic reach in a controlled manner, the company will be well positioned to serve clients nationwide, support complex digital transformation initiatives, and contribute to the modernization and resilience of U.S. industrial and commercial operations.

2.4 Company's Economic Benefits

E-IT Technologies is projected to generate meaningful and measurable economic benefits during its first five years of operation in the United States through the delivery of specialized enterprise technology solutions, including SAP consulting, system integration, process automation, and regulatory compliance services. As organizations continue to modernize their ERP environments and increase their reliance on integrated and automated systems, the company is expected to steadily expand its operations, client base, and workforce.

The company's economic impact will be reflected through consistent revenue growth, job creation, tax contributions, and productivity improvements for client organizations operating in key sectors such as manufacturing, energy, chemicals, pharmaceuticals, retail, logistics, and industrial services.

Projected Financial Performance

E-IT Technologies' financial projections are based on a conservative and phased market entry strategy, reflecting the typical growth cycle of a specialized consulting and enterprise solutions company entering a new market.

• **Revenue Growth:** Total sales are projected to increase from approximately $180,000 in Year 1 to $1,300,000 in Year 5. This growth reflects the company's initial focus on a limited number of consulting engagements, followed by the gradual expansion of its client portfolio, increased demand for integration and automation services, and the introduction of scalable and recurring solution-based offerings.

• **Gross Margin:** Gross margin is projected to grow from approximately $165,600 in Year 1 to $1,196,000 in Year 5. This progression is supported by the company's high-value service offerings, efficient delivery model, and the increasing contribution of recurring and higher-margin solutions over time.

• **Net Profitability:** The company is expected to achieve positive net results from its first year of operations, supported by an outsourced delivery and marketing structure that expands service capacity without increasing fixed payroll. Net profit is projected to grow from approximately $11,388 in Year 1 to $350,367 by Year 5. This trajectory demonstrates a sustainable and scalable business model supported by disciplined cost management and increasing operational efficiency.

These projections indicate a financially viable enterprise with a realistic ramp-up period, capable of supporting long-term growth, reinvestment, and workforce expansion.

Tax Revenue and Fiscal Contributions

E-IT Technologies' operations will contribute to federal and state tax revenues as profitability increases over time.

• **Federal and State Taxes:** Tax contributions are projected to begin in Year 1, reflecting the company's profitability from its first year of operations. Annual tax payments are expected to grow from approximately $4,212 in Year 1 to $129,588 in Year 5, reaching a cumulative total of approximately $263,478 over the five-year period.

• **Total Tax Contributions:** Total tax contributions over the first five years are projected to reach approximately $263,478, directly supporting public services and economic development at the federal and state levels.

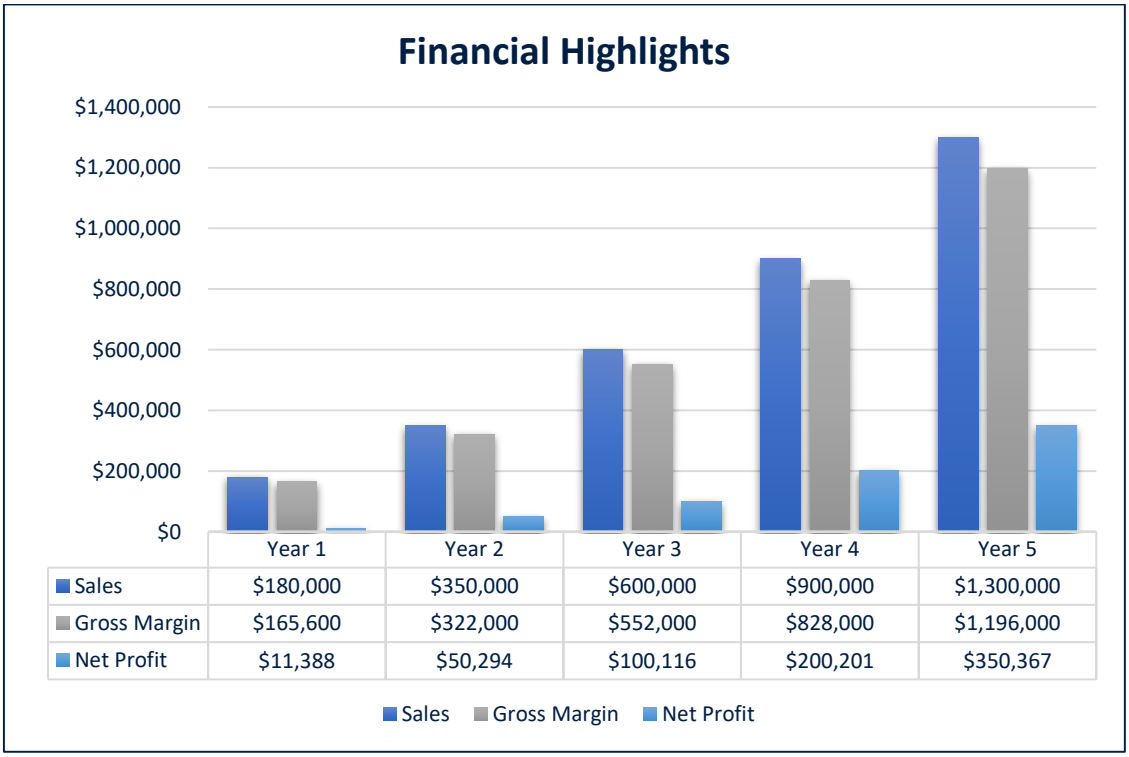
Economic Impact and Market Contribution

Through its operations, E-IT Technologies will contribute to the U.S. economy by supporting enterprise modernization, improving operational efficiency, and enabling organizations to enhance compliance and data reliability within complex business environments.

By delivering specialized and complementary ERP solutions, the company will help client organizations reduce operational inefficiencies, improve process automation, and strengthen supply chain resilience. In addition, the company's phased hiring strategy will contribute to job creation and workforce development, particularly in high-skilled technology roles.

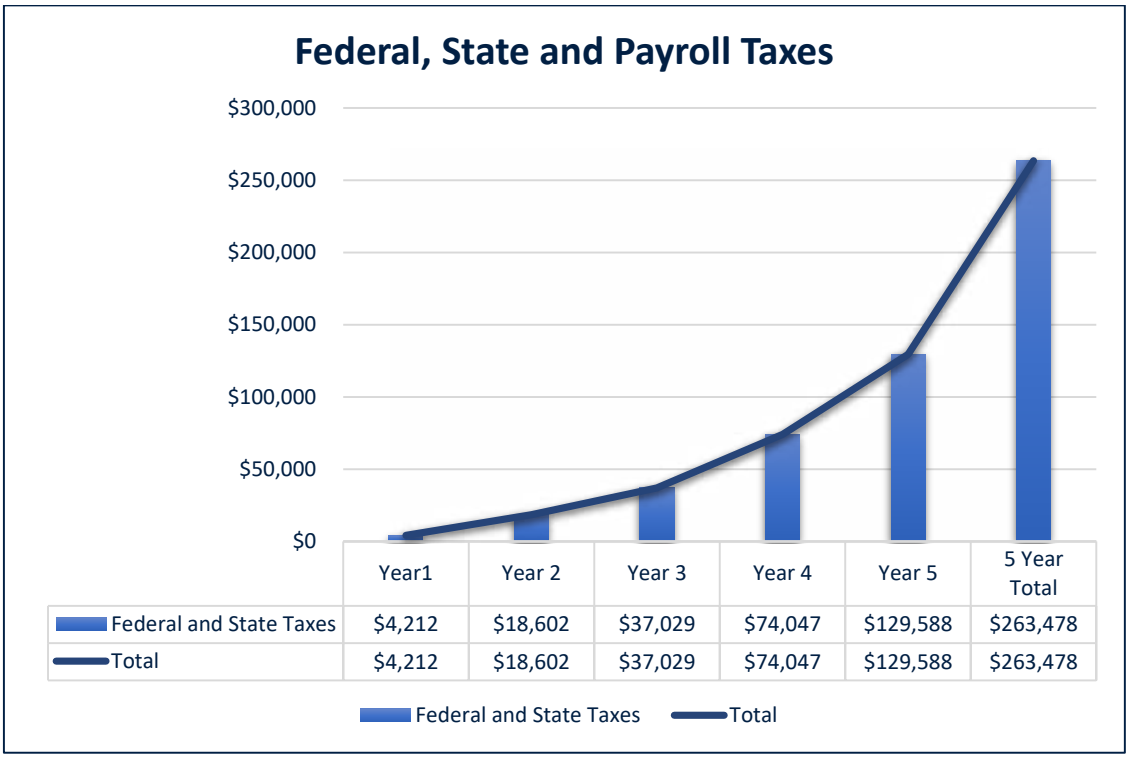
Through sustained and realistic growth, E-IT Technologies is positioned to become a valuable contributor to economic activity, supporting innovation, productivity, and competitiveness across multiple industries in the United States.

2.4.1 Financial Highlights Chart



	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	$180,000	$350,000	$600,000	$900,000	$1,300,000
Gross Margin	$165,600	$322,000	$552,000	$828,000	$1,196,000
Net Profit	$11,388	$50,294	$100,116	$200,201	$350,367

2.4.2 Federal, State and Payroll Taxes Chart



	Year1	Year 2	Year 3	Year 4	Year 5	5 Year Total
Federal and State Taxes	$4,212	$18,602	$37,029	$74,047	$129,588	$263,478
Total	$4,212	$18,602	$37,029	$74,047	$129,588	$263,478

2.5 Summary of Investment

E-IT Technologies will require a **total initial investment of approximately $200,000 to launch** and support its initial operations in the United States. This investment has been carefully structured to cover essential startup expenses and provide a solid level of working capital, consistent with the company's lean market entry strategy and phased growth approach.

The investment prioritizes operational efficiency, allowing the company to establish a professional presence while maintaining financial discipline during its initial stage, when revenue generation is still developing.

In addition to the founder's capital contribution, the company may engage strategic partners or external investors to support its expansion in the U.S. market. These potential partners could contribute additional capital up to approximately 25% equity participation, primarily to strengthen business development, accelerate client acquisition, and enhance market penetration. While the initial launch is fully supported by the founder's investment, these partnerships represent a potential growth lever rather than a dependency for initial operations.

Startup Expenses – $160,000

Startup expenses are designed to establish a functional and scalable operational structure while supporting early-stage business development and client acquisition activities.

• Company Formation and Legal Fees – $15,000: Covers business registration, legal structuring, contract development, and regulatory compliance requirements necessary to establish operations in the United States.

• Office Space and Administrative Facilities – $45,000: Includes office lease or coworking space in Austin, Texas, as well as basic administrative infrastructure required to support business operations and client interactions.

• Market Research, Networking, and Marketing – $50,000: Allocated to market entry activities, branding, website development, networking efforts, and initial client acquisition strategies, which are critical during the company's first year of operation.

• Technology Infrastructure – $35,000: Covers essential hardware, cloud services, software licenses, and development tools required to support SAP consulting, system integration, and enterprise solution delivery.

• Accounting, Tax, and Compliance Services – $15,000: Includes accounting setup, tax advisory services, and compliance support to ensure proper financial management and regulatory adherence.

Total Startup Expenses: $160,000

Startup Assets and Working Capital – $40,000

E-IT Technologies will **maintain approximately $40,000 in cash reserves** to support initial operational needs and ensure short-term liquidity during the early stages of business activity.

These funds will be used to cover:

- initial operating expenses,
- minor project-related costs,
- and short-term financial obligations during the company's market entry phase.

Total Investment Requirement

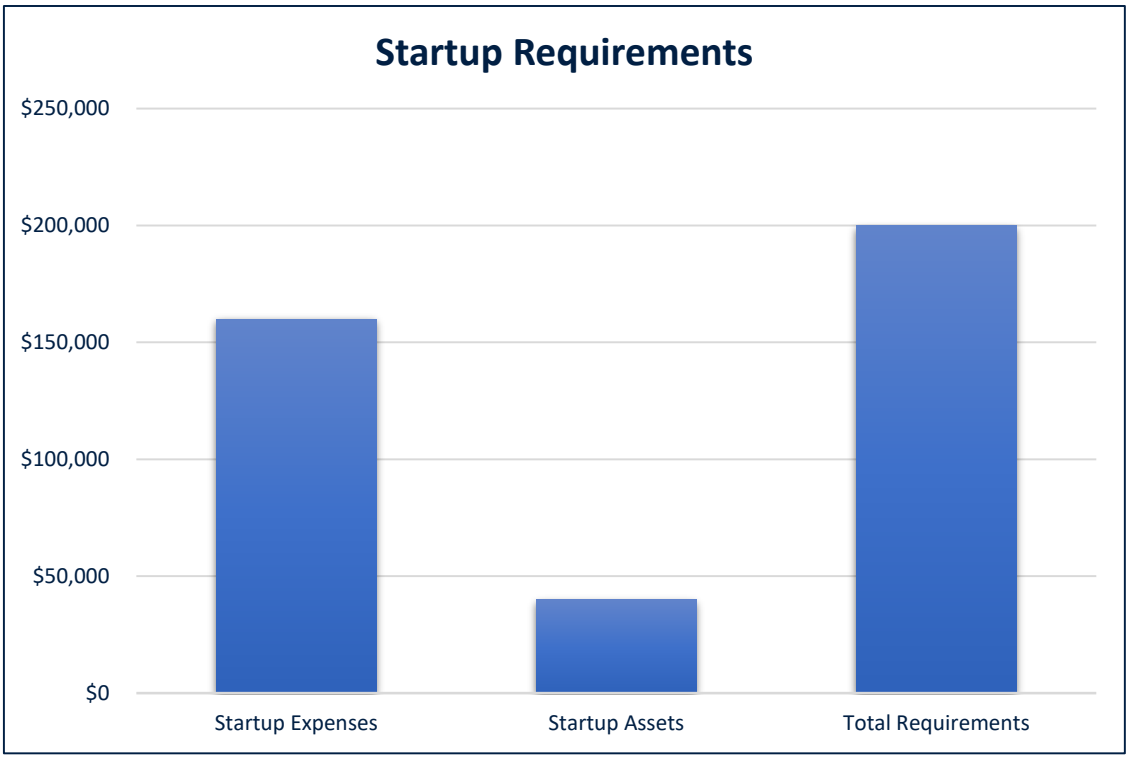
The total initial investment required to establish and launch E-IT Technologies is **estimated at $200,000, combining** startup expenses and initial working capital.

This conservative and disciplined investment structure is aligned with the company's lean operational model in Year 1, allowing it to enter the U.S. market efficiently while minimizing financial risk. As the business grows and revenue increases, additional reinvestment will be supported by operational cash flow rather than excessive upfront capital allocation.

2.5.1 Startup Requirements Table

Startup	
Requirements	
Startup Expenses	
Company Formation and Legal Fees	$15,000
Office Space and Administrative Facilities	$45,000
Market Research, Networking, and Marketing	$50,000
Technology Infrastructure	$35,000
Accounting, Tax, and Compliance Services	$15,000
Total Startup Expenses	$160,000
Startup Assets	
Cash Required	$40,000
Startup Inventory	$0
Other Current Assets	$0
Long-term Assets	$0
Total Assets	$40,000
Total Requirements	**$200,000**

2.5.2 Startup Requirements Chart



3.0 Company's Services

E-IT Technologies will provide a portfolio of specialized enterprise technology solutions designed to optimize business processes, enhance regulatory compliance, and improve system integration within SAP-based environments. The company's services are structured to address critical operational and technological challenges faced by medium to large organizations operating in complex and highly regulated industries.

The company operates through a hybrid model that combines consulting services, project-based solution delivery, and scalable software offerings. This approach enables E-IT Technologies to support both immediate operational needs and long-term digital transformation initiatives, while also creating opportunities for recurring revenue and long-term client relationships.

The company's core service offerings are organized into five primary areas:

1. SAP Consulting and Process Optimization Services

E-IT Technologies will provide specialized SAP consulting services focused on improving logistics, procurement, and supply chain processes. These services include system assessment, process analysis, solution design, and implementation support.

The objective is to help organizations increase operational efficiency, reduce costs, improve data visibility, and enhance coordination across business functions. These services are particularly valuable for companies that require optimization of procurement cycles, inventory management, and material planning within SAP environments.

2. ERP Integration and Automation Solutions

The company will design and implement integration frameworks that connect SAP systems with external platforms, including banking systems, government portals, and third-party business partners. These services focus on improving data exchange, reducing manual intervention, and increasing operational reliability.

Integration solutions will include API-based connectivity, middleware configuration, and event-driven automation processes that support real-time data processing and workflow orchestration across enterprise systems.

3. Electronic Invoicing and Compliance Solutions

E-IT Technologies will deliver automation solutions for electronic invoicing and inbound document processing, enabling organizations to meet regulatory requirements while improving operational efficiency.

These services include document validation, exception handling, audit control mechanisms, and integration with ERP systems. The goal is to reduce compliance risk, improve accuracy in financial and logistics transactions, and ensure readiness for regulatory audits.

This service line builds directly on the company's experience in Brazil, one of the first countries in the world to implement a nationwide mandatory electronic invoicing system. Brazil's Nota Fiscal Eletrônica (NF-e) was instituted in 2005, with mandatory phased adoption beginning in 2008, and the model is internationally recognized for its role in reducing tax evasion. According to the Inter-American Development Bank (IDB) and the Inter-American Center of Tax Administrations (CIAT), electronic invoicing is one of Latin America's main contributions to international taxation in the fight against evasion,[xix] and IDB assessments of Brazil's experience associate e-invoicing adoption with an increase of approximately 12 percent in tax revenue in early-adopting states.[xx] Having developed and operated e-invoicing automation solutions in this pioneering regulatory environment for more than 15 years, the company is positioned to transfer proven, production-tested compliance technology to U.S. organizations as electronic invoicing adoption expands in the United States.

4. Custom SAP Extensions and Application Development

The company will develop custom extensions and enterprise applications designed to enhance the functionality of SAP systems without compromising system integrity.

These solutions will be developed using modern SAP technologies, including ABAP, SAPUI5, and SAP Business Technology Platform. The focus is on delivering clean-core compliant solutions that improve user experience, enable automation, and support evolving business requirements.

5. SaaS and Subscription-Based Solutions

E-IT Technologies will progressively introduce proprietary software solutions delivered through cloud-based and subscription-based models. These solutions will be adapted from the company's existing platforms and tailored to meet the specific requirements of the U.S. market.

The SaaS model will allow clients to access scalable, continuously updated solutions that support automation, compliance, and system integration, while also enabling the company to establish recurring revenue streams and long-term client engagement.

E-IT Technologies will deliver its services through a structured and scalable approach that combines local presence in the United States with selective use of remote and project-based resources.

The company will work directly with clients to understand their operational needs, design tailored solutions, and oversee implementation through coordinated teams and specialized professionals. Technical execution will be supported by qualified personnel and, when appropriate, external specialists under the company's supervision.

This delivery model ensures flexibility, cost efficiency, and consistent service quality, particularly during the company's initial growth phase.

Value Proposition

E-IT Technologies differentiates itself by providing specialized and complementary solutions that extend the capabilities of existing ERP systems rather than replacing them. The company's approach focuses on:

- improving operational efficiency across logistics and financial processes
- enabling reliable system integration and data exchange
- supporting regulatory compliance and audit readiness
- delivering flexible and cost-effective solutions tailored to client needs

By combining deep SAP expertise, integration capabilities, and scalable solution development, E-IT Technologies is positioned to deliver measurable business impact and long-term value to its clients across the United States.

4.0 Industry Overview

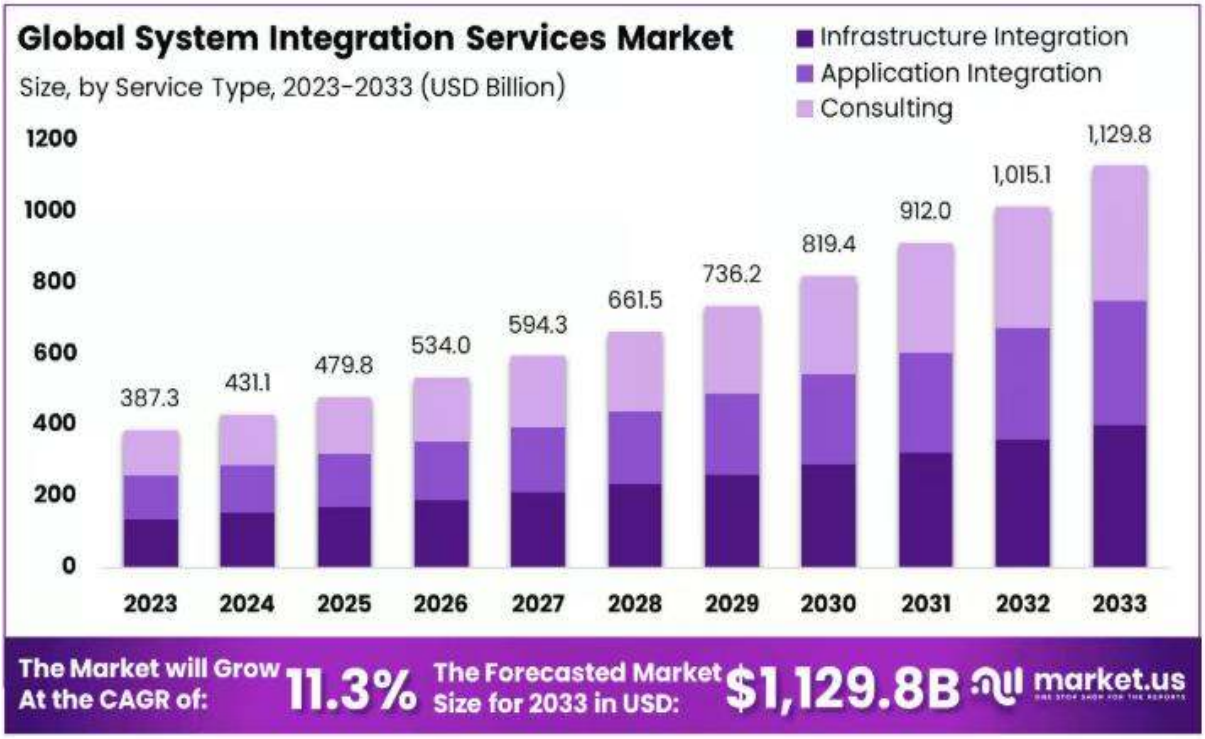
The U.S. data analytics, enterprise integration, and financial planning industry is experiencing rapid expansion, driven by the acceleration of digital transformation across both the public and private sectors. As organizations modernize their operations, there is a growing demand for advanced analytics, predictive modeling, and integrated financial planning tools to enhance decision-making, regulatory compliance, and operational efficiency. According to Grand View Research, the U.S. data integration market was valued at USD 7.14 billion in 2024 and is projected to grow to approximately USD 12.11 billion by 2030, reflecting a compound annual growth rate (CAGR) of 9.1%.[xxi] Globally, the data integration market is expected to reach USD 30.27 billion over the same period.

In parallel, the global data analytics market is expected to grow from USD 64.99 billion in 2024 to USD 402.70 billion by 2032, with an impressive CAGR of 25.5%.[xxii] Similarly, the financial planning software market is projected to expand from USD 3.9 billion in 2023 to USD 9.7 billion by 2031, representing a CAGR of 16.4%.[xxiii]

This growth is reinforced by rising regulatory requirements, increasing volumes of financial and operational data, and the pressing need for real-time fraud detection and risk mitigation. Additionally, the system integration services market is forecasted to grow from USD 387.3 billion in 2023 to USD 1,129.8 billion by 2033, at a CAGR of 11.3%.[xxiv]

The electronic invoicing segment is among the fastest-growing areas of this landscape. According to the Billentis Global E-Invoicing and Tax Compliance Report 2024, the global e-invoicing market was estimated at USD 8.9 billion in 2024 and is projected to reach USD 23.7 billion by 2028, expanding at an average rate of approximately 28% per year.[xxv] In Europe, the European Union's VAT in the Digital Age (ViDA) package, formally adopted by the Council of the European Union in March 2025, will make structured electronic invoicing and digital reporting mandatory for intra-EU cross-border transactions as of 2030,[xxvi] with Germany already requiring

businesses to be able to receive structured e-invoices since January 2025[xxvii] and France phasing in mandatory e-invoicing from September 2026.[xxviii] These developments increase the relevance of e-invoicing readiness for U.S. companies, particularly multinationals with European operations, and reinforce the demand outlook for specialized providers in the U.S. market.



These trends position E-IT Technologies to play a key role in meeting market demand for secure, scalable, and data-driven solutions. By delivering expertise in financial planning, predictive analytics, system integration, and data governance, the company will address critical needs across industries such as finance, energy, healthcare, logistics, manufacturing, and technology. This alignment with strong market growth and national economic priorities provides a solid foundation for long-term business expansion and impact.

4.1 Industry Analysis

The IT consulting industry is entering a period of accelerated expansion, driven by the rising demand for system integration, data analytics, and financial planning technologies. As organizations across multiple sectors transition their operations into cloud-based and data-driven infrastructures, the need for specialized consulting services that can support system upgrades, predictive analytics, and enterprise integration is growing rapidly. This demand is fueled by increased business investment in digital transformation initiatives, regulatory compliance, and the adoption of advanced technologies such as AI and machine learning.-[xxix]

Innovation and technological disruption are reshaping the IT consulting landscape, introducing new players with expertise in data integration, financial system automation, and predictive

modeling. The rapid proliferation of cloud computing, AI tools, and real-time data platforms is creating opportunities for consultants who can design scalable solutions to improve operational efficiency, reduce risks, and optimize decision-making. In this evolving environment, agility and specialized expertise are becoming key competitive advantages for consulting firms.

Sectors such as finance, e-commerce, healthcare, and logistics are expected to be major drivers of industry growth, as these industries rely heavily on secure financial operations, compliance with regulatory frameworks, and advanced analytics for fraud detection and forecasting. The increasing prevalence of digital payment systems, data-driven supply chains, and automated reporting frameworks is also boosting demand for IT consulting services that address both operational and security challenges.

The structure of the IT consulting industry is evolving as well. A growing number of specialized firms are entering the market to serve niche segments such as data governance, SAP and cloud integrations, and AI-powered financial planning. Meanwhile, larger consulting companies are expanding through acquisitions, integrating specialized expertise to strengthen their market position. This combination of new entrants, technological innovation, and strategic consolidation is creating a dynamic and highly competitive industry landscape, one that rewards adaptability, deep technical knowledge, and the ability to deliver measurable results to clients.

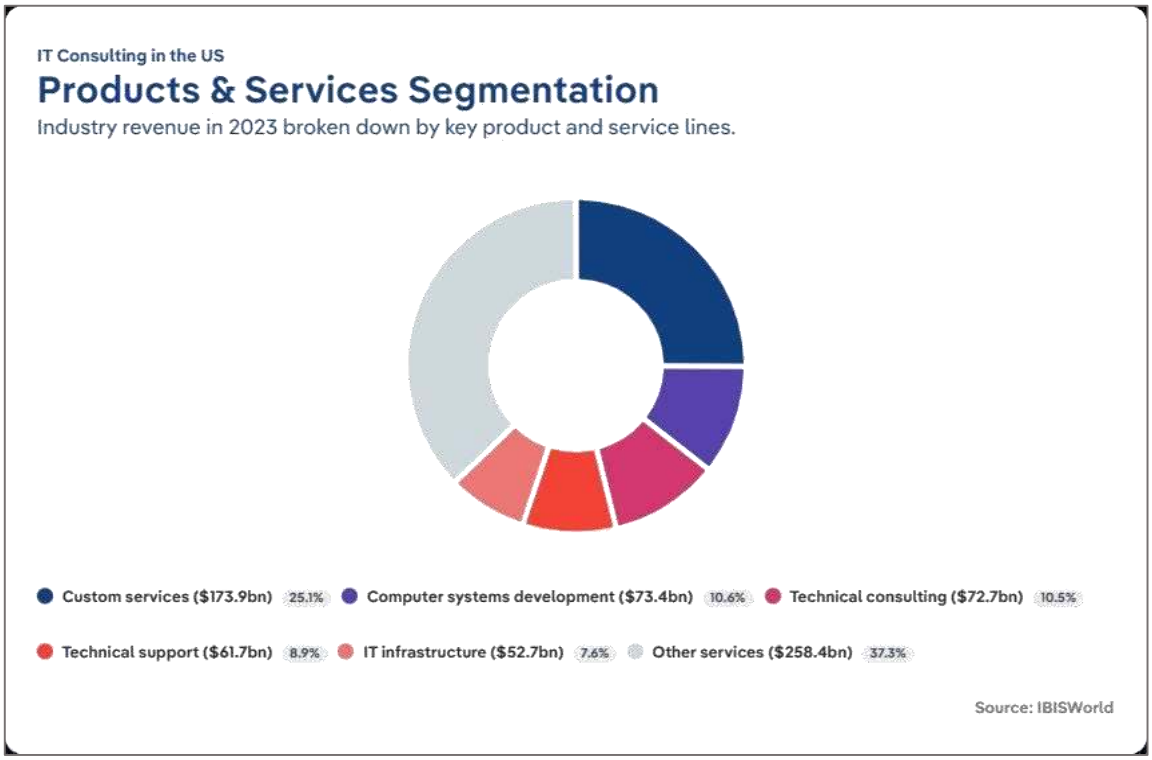
Within this context, E-IT Technologies is well positioned to capitalize on market trends by delivering specialized, high-impact services in financial planning, predictive analytics, system integration, and data governance, directly aligned with the industry's most pressing needs.

4.1.1 Products and Services

Performance of Products and Services: The IT consulting industry is witnessing a dynamic interplay of services, with custom services, despite lagging, remaining the largest segment. Small-sized businesses frequently depend on experts for custom software creation or adaptation, highlighting the significance of custom application design, development, and integration services. The shift towards Software as a Service (SaaS) models is reshaping revenue streams, offering operators a consistent and steady income. IT infrastructure and network management, though not leading, are crucial for enhancing network security. Computer systems development is emerging as a pivotal segment, enabling operators to expand their services, boost scalability, and improve user experience. Technical support, while vital, has remained relatively stagnant due to advancements in user-friendly technology. Technical consulting, though experiencing a slump, is indispensable for strategic IT management. The 'other services' segment, encompassing a variety of offerings like domain name registration and website development, is on the rise and holds significant importance in the industry.

Innovations in Products and Services: Innovation is high in the IT consulting industry, driven by the rapid pace of technological advancements. Operators are constantly upgrading and updating to stay competitive, with relevance being a key determinant of business retention. Businesses

are perpetually seeking to upgrade systems and enhance efficiency, especially during economic downturns, to navigate through challenging periods. Upgrading IT infrastructure and improving network management are seen as strategic moves to capitalize on potential business during positive economic times.[xxx]



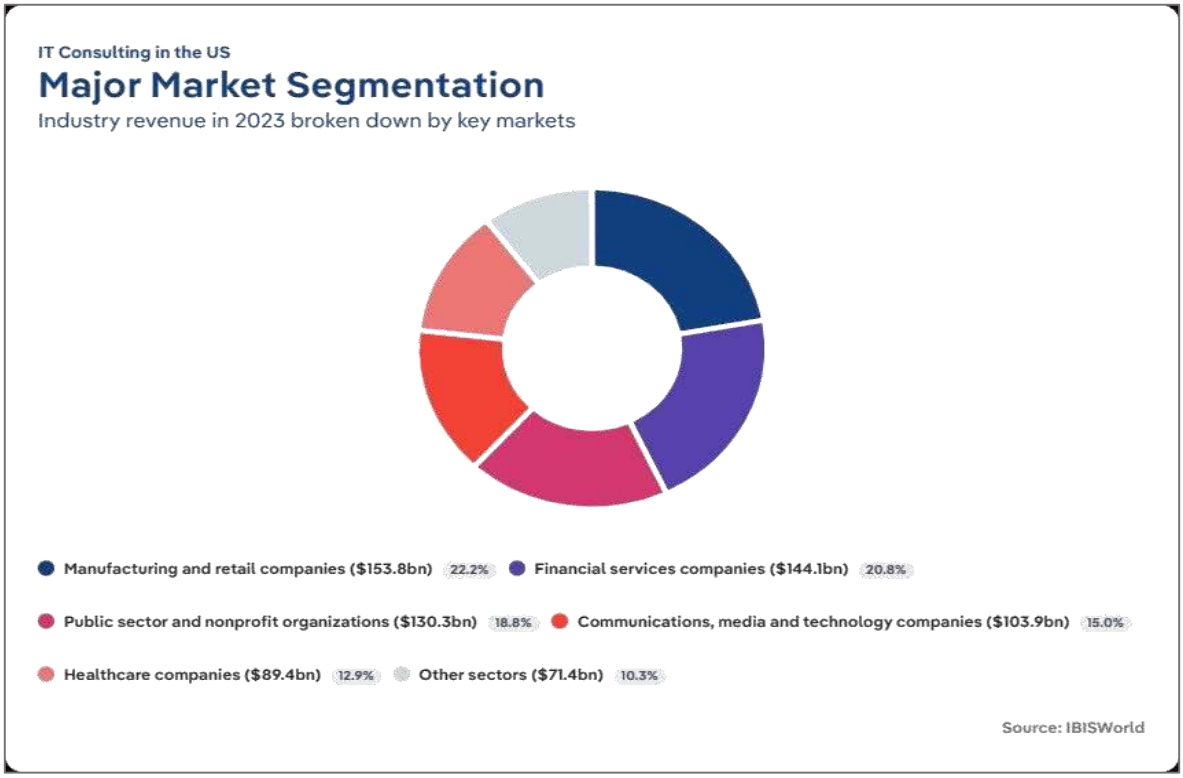
4.2 Major Market Segmentation

Influencing Factors for Industry Markets:

- **Financial Services Market:** This sector, comprising commercial banks, investment banks, insurance companies, and credit card issuers, heavily relies on IT consultants for data protection and advanced data-processing capabilities. The automation of financial transactions through algorithmic trading systems and the need for secure client verification systems to reduce identity theft are driving demand in this market.
- **Public Sector and Nonprofit Organizations Market:** This market includes federal, state, and local governments, and is influenced by the need for IT services in defense systems, social security, benefits administration, and education systems. State budgets directly impact on the demand for IT consulting services, with larger budgets typically increasing demand. However, this market's growth rate is slower compared to other sectors.
- **Manufacturing and Retail Market:** Retailers and manufacturers depend on IT consulting for efficient point-of-sale systems, logistics, inventory management, online channel integration,

and retail data insights. The focus on efficiency and cost reduction is a key driver of demand in this sector.

- **Communications and Other Technical Sectors:** The telecommunications field, along with high-technology industries like consumer electronics, aerospace, and defense, relies on IT consultants for research and development activities. The constant evolution of technology and the need for faster systems are pivotal in this market.
- **Healthcare Market:** Healthcare facilities require IT consulting services for electronic medical records management and compliance with regulations like the Affordable Care Act. This market represents a stable revenue stream due to the ongoing need for compliance and efficient records management.[xxxi]



4.3 Business Location

E-IT Technologies will be headquartered in Austin, Texas, a metropolitan area recognized as one of the most dynamic technology and business hubs in the United States. Austin offers a strong combination of economic scale, sustained job growth, concentration of technology firms, and availability of skilled enterprise IT professionals, making it a strategically suitable location for an SAP-focused consulting and software solutions company with national expansion objectives.

Economic Scale and Market Size

The Austin–Round Rock metropolitan area represents a significant and expanding economic market. As of 2023, the region generated an estimated gross metropolitan product of approximately USD 248 billion, reflecting its position as one of the largest and fastest-growing regional economies in the United States. This level of economic activity supports sustained demand for enterprise software, systems integration, and digital transformation services across multiple industries, including manufacturing, energy, logistics, retail, healthcare, and financial services.[xxxii]

Technology Sector Concentration

Austin is widely recognized as a major U.S. technology hub, often referred to as part of the "Silicon Hills" region. The metropolitan area hosts approximately 195,900 high-technology jobs, representing 16.3% of total regional employment, a proportion significantly higher than the national average of approximately 9%. This high concentration of technology employment demonstrates both a strong client base for enterprise IT services and a deep labor pool for recruiting skilled professionals.[xxxiii]

The region is home to an estimated 9,800 technology companies, ranging from global corporations to specialized consulting firms and software providers. This density of technology-driven organizations creates consistent demand for SAP consulting, system integration, compliance automation, and application modernization services aligned with E-IT Technologies' core offerings.[xxxiv]

Employment Growth and Labor Market Strength

Austin continues to demonstrate strong employment growth relative to other major U.S. metropolitan areas. In 2024, the region added approximately 28,500 nonfarm payroll jobs, reflecting an annual employment growth rate of roughly 2.1%, positioning Austin among the fastest-growing large metropolitan labor markets in the country.[xxxv]

Within the technology and professional services segments, growth has been particularly strong. Between 2018 and 2023, the Central Texas region added approximately 228,000 total jobs, with nearly 48,000 of those positions attributed to technology-related sectors, underscoring the sustained expansion of enterprise IT and digital services.[xxxvi]

Availability of Specialized Talent

The Austin metropolitan area maintains a substantial workforce in computer and mathematical occupations, totaling approximately 79,700 professionals, including systems analysts, software developers, integration engineers, and enterprise application specialists. These roles closely align with the staffing requirements of E-IT Technologies, particularly for SAP functional consultants, ABAP developers, integration engineers, and technical support professionals.[xxxvii]

Strategic Fit for E-IT Technologies

Austin's economic profile, technology concentration, and skilled labor availability make it a strategically advantageous location for E-IT Technologies' initial U.S. operations. The city provides direct access to enterprise clients operating complex SAP environments, a strong pipeline of qualified professionals, and a business climate supportive of technology-driven consulting firms.

By establishing its headquarters in Austin, Texas, E-IT Technologies is positioned to efficiently serve clients nationwide while supporting its planned expansion across the United States. The location supports both immediate operational needs and long-term growth objectives, reinforcing the company's ability to deliver specialized SAP logistics, compliance automation, integration, clean-core modernization, and program governance services to organizations across multiple sectors.

5.0 Strategy and Implementation

E-IT Technologies will execute a disciplined and phased strategy focused on building a sustainable U.S.-based operation, establishing market credibility, and scaling service delivery nationwide. The company's implementation approach is designed to balance technical excellence, controlled growth, and long-term operational resilience, while remaining closely aligned with the founder's demonstrated expertise in SAP solutions, enterprise integration, and compliance-driven process automation.

The strategy emphasizes service specialization, gradual workforce expansion, strong governance, and repeatable delivery models, allowing the company to grow without compromising quality or financial stability.

5.1 Swot Analysis

A SWOT analysis is a strategic planning tool that helps businesses identify their internal strengths and weaknesses, as well as external opportunities and threats. By analyzing these factors, E-IT Technologies can develop effective strategies to leverage its strengths and opportunities while mitigating risks and addressing weaknesses.

5.1.1 Strengths

- **Extensive SAP Expertise:** Mr. Souza has more than 20 years of hands-on experience in SAP logistics, procurement, finance, and global trade solutions, including large-scale implementations and rollouts.
- **Proprietary SAP Add-On Solutions:** Ownership and proven delivery of proprietary SAP add-ons (e.g., electronic invoicing and automation solutions), providing differentiation from pure consulting firms.

- **Strong Compliance and Integration Background:** Deep experience integrating SAP with government platforms, banking systems, and third-party providers in regulated environments.
- **Clean Core and Modernization Capability:** Specialized expertise in SAP clean-core extensions and application modernization, aligned with current SAP best practices.
- **Industry-Diverse Client Portfolio:** Demonstrated experience across manufacturing, energy, retail, pharmaceuticals, chemicals, and industrial sectors.
- **Lean and Scalable Delivery Model:** Ability to deliver high-value projects with a small, specialized team, supporting strong margins and controlled growth.
- **Founder-Led Technical Leadership:** Direct involvement of the Founder as Principal SAP Solution Architect ensures quality, consistency, and credibility in early-stage operations.
- **Strategic Location in Austin, Texas:** Access to a strong enterprise IT market, skilled SAP talent pool, and technology-driven client base.

5.1.2 Weaknesses

- **Initial Brand Recognition in the U.S. Market:** While well-established internationally, the company is still building brand visibility and market presence in the United States.
- **Dependence on Founder in Early Stages:** In the initial years, technical leadership and key client relationships are highly concentrated with the Founder.
- **Limited Initial Workforce Capacity:** Early-stage operations rely on a small team, requiring careful project selection and capacity management.

5.1.3 Opportunities

- **Growing Demand for SAP Logistics and Procurement Optimization:** U.S. companies continue to invest in supply chain efficiency, automation, and cost control.
- **Expansion of Electronic Invoicing and Digital Compliance:** Increasing regulatory pressure and digital reporting requirements create demand for automated compliance solutions. Federal initiatives such as OMB Memorandum M-15-19, the Treasury Invoice Processing Platform, and the DBNAlliance e-invoice exchange network, together with mandates advancing in Europe, signal accelerating adoption in the U.S. market.
- **Enterprise System Modernization Initiatives:** Many organizations are modernizing legacy SAP customizations, creating strong demand for clean-core and cloud-ready solutions.
- **Increased Need for System Integration:** Growth in API-driven ecosystems, banking integrations, and government reporting systems supports long-term demand.
- **SAP S/4HANA Adoption and Migration:** Ongoing SAP S/4HANA transitions create opportunities for consulting, extensions, and governance services.
- **Talent Shortage in Specialized SAP Skills:** Limited availability of senior SAP professionals increases the value of specialized consulting firms.
- **Scalable National Delivery Model:** Remote and hybrid delivery models enable expansion across the U.S. without heavy physical infrastructure investment.

- **Potential Productization of Solutions:** Opportunity to evolve proprietary add-ons into reusable accelerators or SaaS-style offerings.

5.1.4 Threats

- **Competition from Large Consulting Firms:** Major system integrators and global consulting firms may compete for larger enterprise contracts.
- **Economic Cycles Affecting IT Spending:** Economic downturns could temporarily delay enterprise investment in large transformation projects.
- **Rapid Technological Change:** Continuous evolution of SAP platforms and integration technologies requires ongoing investment in skills and tools.

5.2 Website and Digital Marketing

E-IT Technologies already maintains an established corporate website in Brazil, which serves as a reference point for the company's technical expertise, proprietary SAP add-on solutions, and successful project delivery across multiple industries. As part of its U.S. market entry strategy, the company will leverage and expand this existing digital presence, adapting content and messaging to the U.S. market while preserving the company's technical identity and credibility.

The website and digital marketing strategy will play a central role in supporting business development, client acquisition, and brand positioning in the United States.

Website Strategy

The U.S.-focused version of the E-IT Technologies website will function as a comprehensive digital hub, providing clear and structured information about the company's services, delivery model, and professional background of its founder. The website will emphasize the company's specialization in SAP-based enterprise solutions and its experience operating in regulated and complex operational environments.

Key components of the website will include:

- **Service Descriptions**

Dedicated pages will be developed for each core service line, including:

  - SAP Consulting and Process Optimization Services
  - ERP Integration and Automation Solutions
  - Electronic Invoicing and Compliance Solutions
  - Custom SAP Extensions and Application Development
  - SaaS and Subscription-Based Solutions

Each service page will clearly describe scope, typical use cases, and business value, with a focus on operational efficiency, regulatory compliance, system integration, and long-term scalability.

- **Company Background and Leadership**

  A detailed overview of E-IT Technologies' history and the professional background of Mr. Luciano Aparecido de Souza, highlighting more than two decades of SAP consulting, solution architecture, and product development experience.

- **Case Studies and Project Experience**

  Selected examples of past projects and solution deployments (without disclosure of sensitive client data), demonstrating the company's experience across manufacturing, energy, retail, pharmaceuticals, and industrial sectors.

- **Insights and Knowledge Sharing**

  A blog or insights section featuring articles on SAP best practices, system modernization, compliance automation, integration strategies, and clean-core architecture. This content will reinforce technical credibility and support organic search visibility.

- **Contact and Consultation Interface**

  A streamlined contact form and consultation request mechanism to facilitate direct communication with prospective clients, partners, and stakeholders in the U.S. market.

Digital Marketing Strategy

The digital marketing strategy will be designed to support a specialized, B2B-oriented consulting business, focusing on quality lead generation rather than mass-market exposure. Activities will be aligned with the company's target audience of medium and large enterprises using SAP ERP systems.

Key elements include:

1. **Search Engine Optimization (SEO):** Website content will be optimized for relevant keywords related to SAP consulting, logistics optimization, electronic invoicing, system integration, and clean-core modernization. SEO efforts will focus on attracting decision-makers searching for specialized SAP expertise.
2. **Content Marketing and Thought Leadership:** Regular publication of technical articles, implementation insights, and best practices will position E-IT Technologies as a knowledgeable and reliable SAP partner. Content will be adapted from real project experience and aligned with U.S. market terminology and requirements.
3. **Professional Networking and LinkedIn Presence:** LinkedIn will serve as the primary social media channel, supporting professional visibility, knowledge sharing, and direct engagement with IT, finance, procurement, and supply chain leaders. Company updates, articles, and project highlights will be shared consistently.

4. **Email Communication and Relationship Nurturing:** Targeted email communication will be used to maintain contact with prospects, share insights, and follow up on consultations or industry interactions. This channel will support long-term relationship building rather than mass outreach.
5. **Selective Paid Advertising:** When appropriate, limited and targeted advertising campaigns (such as LinkedIn Ads or Google Ads) will be used to promote specific service offerings or thought leadership content, focusing on high-value keywords and decision-maker audiences.

Strategic Role of Digital Presence

Rather than serving solely as a marketing tool, the website and digital channels will support credibility building, transparency, and informed decision-making. By extending an already established international digital presence to the U.S. market, E-IT Technologies reduces market entry risk and demonstrates operational continuity, technical maturity, and long-term commitment.

This structured digital strategy will enable E-IT Technologies to strengthen brand recognition, support client acquisition, and sustain controlled growth as the company expands its operations across the United States.

5.3 Sales Strategy

E-IT Technologies will implement a focused and relationship-driven sales strategy designed to support the commercialization of its SAP-based consulting and solution services across the United States. The company's approach prioritizes trust, technical credibility, and long-term client relationships, targeting organizations that operate complex ERP environments and require specialized expertise in logistics, procurement, compliance automation, system integration, and SAP application modernization.

The sales strategy is structured around direct B2B engagement, strategic partnerships, and selective digital channels, ensuring controlled and sustainable growth.

Direct B2B Sales Approach

- **Consultative and Relationship-Based Selling:** Sales efforts will emphasize consultative engagements with senior decision-makers such as CIOs, IT Directors, Procurement Managers, Finance Leaders, and SAP Program Owners. The objective is to understand operational challenges and propose tailored SAP solutions rather than standardized offerings.
- **Targeted Industry Outreach:** Business development activities will focus on companies in manufacturing, energy, retail, pharmaceuticals, logistics, e-commerce, and other SAP-intensive industries. Outreach will be conducted through professional networks, industry events, referrals, and direct engagement with organizations running SAP ECC or SAP S/4HANA environments.

- **Solution-Oriented Proposals:** Sales proposals will be structured around clear scopes of work, implementation timelines, and operational benefits, such as process optimization, regulatory compliance, system stability, and reduction of technical debt. Emphasis will be placed on measurable business outcomes rather than generic consulting hours.

Strategic Partnerships and Alliances

- **SAP Ecosystem and Technology Partnerships:** E-IT Technologies will pursue partnerships with SAP-focused service providers, integration platforms, and cloud infrastructure vendors to complement its offerings and support joint delivery of complex projects.
- **Professional and Advisory Firms:** Alliances with accounting firms, tax advisors, logistics consultants, and ERP advisory firms will serve as a referral channel, particularly for clients requiring electronic invoicing, compliance automation, or cross-system integrations.
- **System Integrators and Local Consultancies:** The company will collaborate selectively with regional system integrators and niche consultancies to support larger engagements or specialized project phases, enabling scalability without excessive fixed costs.

Digital Marketing and Inbound Sales Support

- **Thought Leadership and Technical Content:** Technical articles, case highlights, and best-practice discussions related to SAP logistics, electronic invoicing, clean-core architecture, and system integration will support inbound interest and reinforce technical credibility.
- **Professional Online Presence:** LinkedIn will be the primary digital channel for engaging enterprise professionals, sharing insights, and supporting relationship building. Website inquiries will be managed as qualified leads rather than mass-market prospects.
- **CRM and Lead Management:** A structured CRM process will be used to track opportunities, manage client interactions, and support follow-ups, ensuring consistency and efficiency across the sales pipeline.

Client Retention and Account Expansion

- **Long-Term Engagement Model:** E-IT Technologies will prioritize multi-phase projects, support contracts, and ongoing advisory relationships, allowing clients to evolve their SAP landscapes over time.
- **Cross-Selling of Complementary Services:** Existing clients will be introduced to additional service lines, such as system modernization, integration enhancements, or governance frameworks, based on evolving operational needs.
- **Referral-Based Growth:** Client satisfaction and project success will serve as a primary driver of referrals, particularly within SAP user communities and industry networks.

Public Sector and Regulated Environment Opportunities

- **Compliance-Driven Organizations:** The company will position its services for organizations operating in regulated environments that require robust SAP governance, secure integrations, and reliable compliance processes.
- **Government and Institutional Engagements:** Where applicable, E-IT Technologies will pursue projects with public sector entities, government contractors, and regulated institutions that rely on SAP systems for logistics, procurement, and financial operations.

Through this sales strategy, E-IT Technologies will balance early revenue generation with long-term market positioning, leveraging deep technical expertise and a disciplined go-to-market approach. This structure supports scalable growth, strong client retention, and sustainable profitability as the company expands its operations across the U.S. market.

5.4 Sales Forecast

E-IT Technologies' sales forecast is based on a conservative and phased growth strategy, reflecting the company's structured market entry into the United States and its progressive expansion of services and client relationships over time.

The revenue model combines consulting services, project-based solution delivery, and recurring software-based offerings. This diversified structure allows the company to generate initial revenue through specialized SAP consulting services, while gradually increasing its share of higher-value integration projects and scalable subscription-based solutions.

Revenue Growth Overview

Total revenue is projected to **grow from $180,000 in Year 1 to $1,300,000 in Year 5**, reflecting a realistic ramp-up period followed by accelerated growth as the company expands its client base, service capacity, and solution portfolio.

During the first year of operations, the company will focus on a limited number of consulting engagements and small-scale projects, generating revenue primarily through SAP consulting and process optimization services. Service delivery capacity will be reinforced through a specialized outsourced technical and marketing services firm, allowing the company to support a higher volume of engagements from the first months of operation while keeping its internal structure lean. As market presence strengthens, revenue growth will be driven by increased demand for integration, automation, and compliance solutions.

By Year 4 and Year 5, a larger portion of revenue is expected to come from scalable and recurring services, particularly SaaS and subscription-based solutions, as well as long-term client contracts.

Revenue by Service Line

• **SAP Consulting and Process Optimization Services:** This service line represents the primary revenue driver in the early stages of the business. Revenue is projected to grow from $90,000 in Year 1 to $260,000 in Year 5, reflecting steady demand for process optimization, logistics improvements, and SAP advisory services.

• **ERP Integration and Automation Solutions:** Integration services are expected to expand significantly as the company builds its client base. Revenue is projected to increase from $35,000 in Year 1 to $300,000 in Year 5, driven by demand for system connectivity, automation, and real-time data exchange across enterprise environments.

• **Electronic Invoicing and Compliance Solutions:** This service line reflects the company's core expertise and is expected to grow consistently, from $25,000 in Year 1 to $250,000 in Year 5. Growth is driven by increasing regulatory complexity and the need for automated compliance solutions.

• **Custom SAP Extensions and Application Development:** Revenue from custom development services is projected to grow from $15,000 in Year 1 to $200,000 in Year 5, as clients require tailored enhancements and system extensions to support evolving business needs.

• **SaaS and Subscription-Based Solutions:** Recurring revenue from SaaS offerings is expected to grow from $15,000 in Year 1 to $290,000 in Year 5. This reflects the gradual adoption of proprietary solutions and the transition toward scalable, subscription-based service models.

Cost of Sales and Margin Structure

Direct costs of sales are projected to remain relatively low compared to total revenue, reflecting the company's high-value service model and efficient delivery structure. Total direct costs are expected to **increase from $14,400 in Year 1 to $104,000 in Year 5**, as service delivery expands and additional technical resources are required.

The company maintains strong gross margins across all service lines, supported by specialized expertise, efficient use of resources, and increasing contributions from higher-margin services such as automation solutions and SaaS offerings.

Strategic Growth Considerations

The sales forecast reflects a balanced and realistic growth trajectory, characterized by:

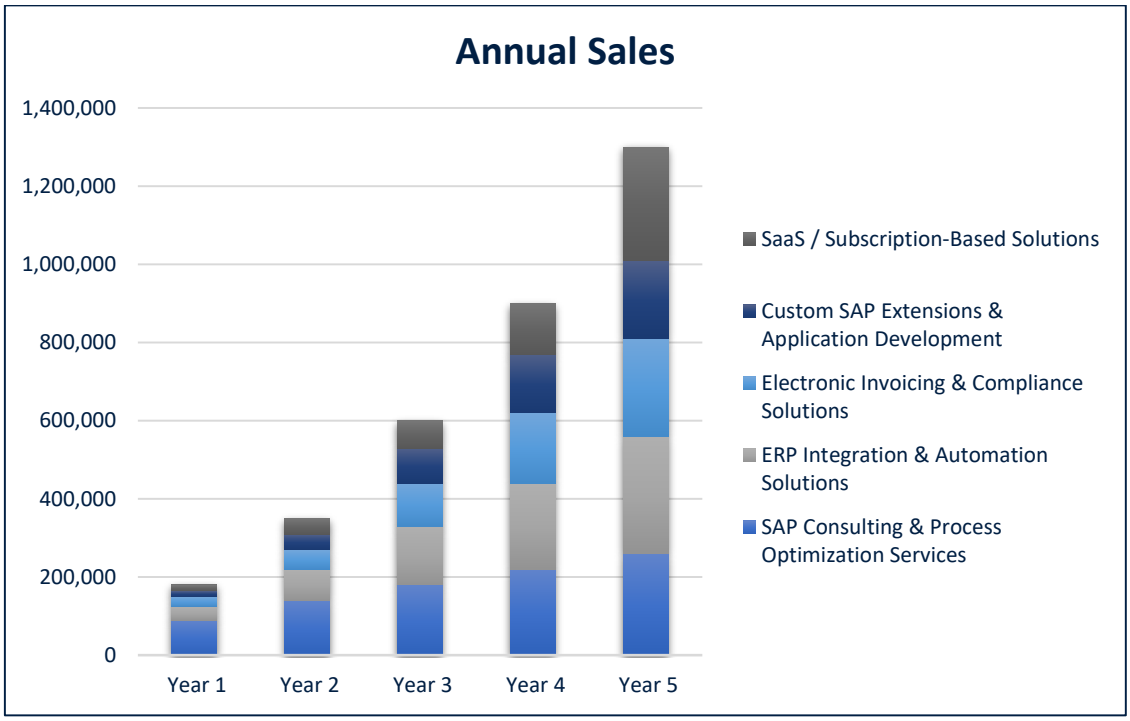
- initial reliance on consulting services to establish market presence
- gradual expansion into integration and automation projects
- increasing contribution of scalable and recurring revenue streams
- alignment between revenue growth and hiring strategy

This approach ensures that E-IT Technologies can scale its operations in a controlled and sustainable manner, while maintaining service quality, financial stability, and long-term profitability.

5.4.2 Annual Sales Forecast Table

Sales Forecast					
	Year 1	Year 2	Year 3	Year 4	Year 5
Sales					
SAP Consulting & Process Optimization Services	$90,000	$140,000	$180,000	$220,000	$260,000
ERP Integration & Automation Solutions	$35,000	$80,000	$150,000	$220,000	$300,000
Electronic Invoicing & Compliance Solutions	$25,000	$50,000	$110,000	$180,000	$250,000
Custom SAP Extensions & Application Development	$15,000	$40,000	$90,000	$150,000	$200,000
SaaS / Subscription-Based Solutions	$15,000	$40,000	$70,000	$130,000	$290,000
Total Sales	$180,000	$350,000	$600,000	$900,000	$1,300,000
Direct Cost of Sales	Year 1	Year 2	Year 3	Year 4	Year 5
SAP Consulting & Process Optimization Services	$7,200	$11,200	$14,400	$17,600	$20,800
ERP Integration & Automation Solutions	$2,800	$6,400	$12,000	$17,600	$24,000
Electronic Invoicing & Compliance Solutions	$2,000	$4,000	$8,800	$14,400	$20,000
Custom SAP Extensions & Application Development	$1,200	$3,200	$7,200	$12,000	$16,000
SaaS / Subscription-Based Solutions	$1,200	$3,200	$5,600	$10,400	$23,200
Subtotal Direct Cost of Sales	**$14,400**	**$28,000**	**$48,000**	**$72,000**	**$104,000**

5.4.3 Annual Sales Chart



6.0 Management Structure

As previously mentioned, Mr. Luciano Aparecido de Souza will be the Founder, General Manager and Principal SAP Solution Architect of E-IT Technologies. The Personnel Plan shows that the company expects to make gradual investments in personnel in the first years of operation, and by year 5, the company will have 12 employees, including Mr. Luciano Aparecido de Souza.

6.1 Staffing Requirements

E-IT Technologies, under the leadership of Mr. Luciano Aparecido de Souza, has developed a structured five-year staffing plan designed to support the company's phased growth in SAP consulting, system integration, electronic invoicing automation, custom development, and scalable software solutions.

The personnel strategy emphasizes a lean initial structure, followed by progressive expansion aligned with revenue growth, service diversification, and increasing market presence across the United States. Hiring is planned to occur gradually to ensure operational efficiency, cost control, and proper alignment with business demand.

Year 1 – Initial Operational Team

During the first year of operations, E-IT Technologies will establish a lean foundational team of three professionals, focusing on leadership, business development, and administrative support.

This structure allows the company to enter the market efficiently while maintaining low fixed costs and flexibility during the initial phase.

The Year 1 team will consist of:

• **Founder, General Manager and Principal SAP Solution Architect (1):** Responsible for overall business strategy, solution architecture, client engagement, and supervision of all service delivery activities.

• **Business Development Manager (1):** Responsible for client acquisition, relationship development, proposal preparation, and the establishment of the company's initial market presence.

• **Administrative/Operations Assistant – Part-time (1):** Responsible for administrative coordination, scheduling, documentation, and operational support.

During this phase, technical execution activities such as SAP consulting, integration, and development will be supported directly by the founder and supplemented, when necessary, through outsourced or project-based resources. This approach ensures cost efficiency while the company builds its initial client base.

Years 2 to 5 – Scaled Growth Structure

As the company expands its client portfolio and service offerings, staffing will grow in a structured and controlled manner. By Year 5, E-IT Technologies will employ 12 professionals, supporting consulting, delivery, integration, customer management, and administrative functions.

Key staffing evolution includes:

• **Founder, General Manager and Principal SAP Solution Architect:** Maintained as one position throughout the five-year period, overseeing strategy, solution architecture, and overall business operations.

• **Business Development Manager:** Maintained throughout all years, responsible for sustaining pipeline growth and managing client relationships.

• **Administrative/Operations Assistant – Part-time:** Maintained across all years, supporting internal operations and administrative functions.

• **SAP/ERP Consultants:** Introduced in Year 2 and expanding to 2 positions by Year 5, supporting SAP consulting, logistics, procurement, and financial integration services.

• **Sales and Marketing Specialist:** Introduced in Year 2 and maintained through Year 5, supporting lead generation, brand positioning, and market expansion.

• **Project Manager:** Introduced in Year 3, responsible for overseeing project delivery, timelines, and resource coordination.

• **Technical Support Engineer:** Introduced in Year 3, providing post-implementation support and ensuring service continuity.

• **Senior Solution Architect:** Introduced in Year 4, responsible for advanced solution design, system architecture, and technical leadership for complex projects.

• **HR/Recruitment Specialist:** Introduced in Year 4, supporting hiring, onboarding, and workforce development as the company scales.

• **Customer Success Manager:** Introduced in Year 5, responsible for client retention, satisfaction, and expansion of recurring services.

• **Finance and Accounting Specialist:** Introduced in Year 5, responsible for financial reporting, compliance, and operational financial control.

Workforce Growth Summary

• Total headcount grows from **3 employees in Year 1 to 12 employees in Year 5**

• Total annual payroll increases from **$93,000 in Year 1 to $668,000 in Year 5**

• Hiring is directly aligned with revenue growth, service demand, and operational expansion

Strategic Workforce Impact

This staffing plan allows E-IT Technologies to scale operations in a controlled and sustainable manner, ensuring that workforce expansion is aligned with actual business performance and market demand.

By adopting this phased approach, E-IT Technologies reduces early-stage financial risk while building the internal capabilities necessary to deliver high-value enterprise solutions and maintain strong client relationships across the United States.

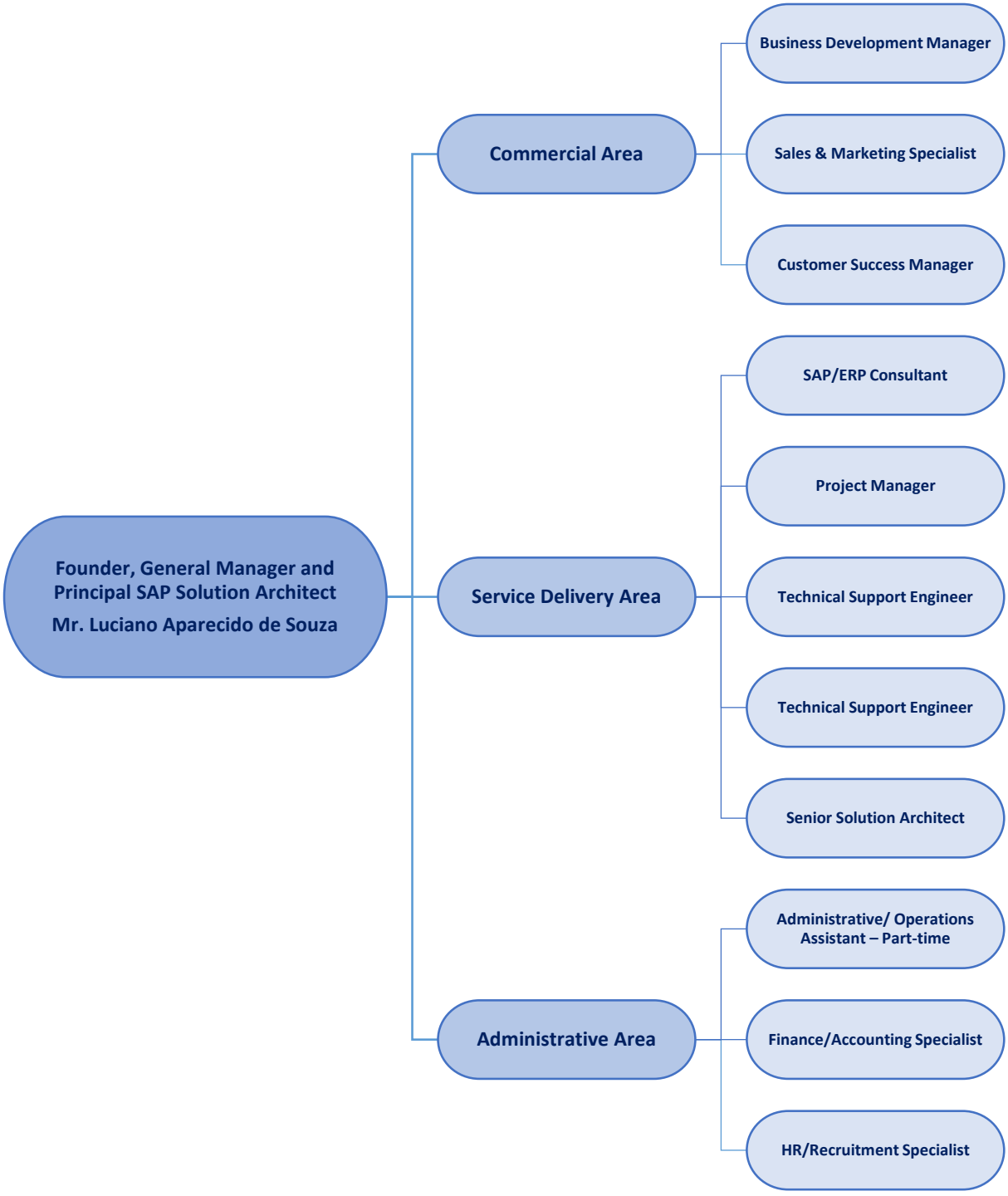
6.2 Annual Personnel Plan Table

Personnel Plan					
	Year 1	Year 2	Year 3	Year 4	Year 5
Founder, General Manager and Principal SAP Solution Architect	$56,000	$75,000	$78,000	$85,000	$105,000
Business Development Manager	$24,500	$30,000	$32,000	$36,000	$42,000
Administrative/Operations Assistant – Part-time	$12,500	$26,000	$28,000	$30,000	$33,000
SAP/ERP Consultant	$0	$55,000	$110,000	$120,000	$130,000
Sales & Marketing Specialist	$0	$30,000	$32,000	$36,000	$39,000
Project Manager	$0	$0	$48,000	$52,000	$55,000
Technical Support Engineer	$0	$0	$48,000	$50,000	$53,000
Senior Solution Architect	$0	$0	$0	$65,000	$70,000
HR/Recruitment Specialist	$0	$0	$0	$39,000	$41,000
Customer Success Manager	$0	$0	$0	$0	$48,000
Finance/Accounting Specialist	$0	$0	$0	$0	$52,000
Total People	3	5	8	10	12
Total Payroll	**$93,000**	**$216,000**	**$376,000**	**$513,000**	**$668,000**

6.3 Five-Year Personnel Plan Table

Personnel Plan					
	Year 1	Year 2	Year 3	Year 4	Year 5
Founder, General Manager and Principal SAP Solution Architect	1	1	1	1	1
Business Development Manager	1	1	1	1	1
Administrative/Operations Assistant – Part-time	1	1	1	1	1
SAP/ERP Consultant	0	1	2	2	2
Sales & Marketing Specialist	0	1	1	1	1
Project Manager	0	0	1	1	1
Technical Support Engineer	0	0	1	1	1
Senior Solution Architect	0	0	0	1	1
HR/Recruitment Specialist	0	0	0	1	1
Customer Success Manager	0	0	0	0	1
Finance/Accounting Specialist	0	0	0	0	1
Total People	**3**	**5**	**8**	**10**	**12**

6.4 Organizational Chart – Year 5



6.5 Duties and Responsibilities

E-IT Technologies has defined a structured distribution of roles and responsibilities to ensure efficient operations, high-quality service delivery, and proper organizational governance. The Founder will operate at a strategic and executive level, while other team members will support operational, technical, and administrative functions under supervision.

Founder, General Manager and Principal SAP Solution Architect

- Define and oversee the company's overall business strategy, growth plans, and market positioning in the United States
- Lead solution architecture design, ensuring alignment between client requirements and scalable SAP-based systems
- Supervise all service delivery activities, ensuring quality, consistency, and compliance with industry standards
- Manage key client relationships, including negotiations, strategic accounts, and long-term partnerships
- Establish and maintain technical standards, integration frameworks, and system governance practices
- Oversee financial performance, budgeting, and resource allocation to ensure sustainable growth
- Direct hiring decisions, organizational development, and team structuring aligned with business expansion
- Coordinate with external partners, vendors, and stakeholders to support business development and service delivery

Business Development Manager

- Identify and develop new business opportunities across target industries
- Manage client relationships and maintain an active sales pipeline
- Prepare proposals, contracts, and service agreements
- Support market expansion initiatives and strategic partnerships

Administrative/Operations Assistant – Part-time

- Support daily administrative operations and office coordination
- Manage scheduling, documentation, and internal communications
- Assist with vendor coordination and basic financial tracking
- Provide operational support across multiple business functions

SAP/ERP Consultant

- Support SAP system implementation, configuration, and optimization projects
- Assist in analyzing business requirements and translating them into system solutions

- Collaborate with technical teams to ensure proper system integration
- Participate in testing, validation, and documentation of solutions

Sales & Marketing Specialist

- Develop and execute marketing strategies and campaigns
- Support lead generation and client outreach initiatives
- Manage digital presence, branding, and promotional materials
- Assist in market analysis and positioning strategies

Project Manager

- Coordinate project timelines, resources, and deliverables
- Monitor project progress and ensure alignment with client expectations
- Facilitate communication between technical teams and clients
- Ensure quality control and adherence to project standards

Technical Support Engineer

- Provide technical support for implemented solutions
- Monitor system performance and identify operational issues
- Assist in troubleshooting and resolution of technical problems
- Support testing, maintenance, and system updates

Senior Solution Architect

- Design advanced system architectures and integration frameworks
- Provide technical leadership for complex projects
- Review and validate solution designs and technical implementations
- Support innovation and continuous improvement of service offerings

HR/Recruitment Specialist

- Manage recruitment, hiring, and onboarding processes
- Support workforce planning and organizational development
- Ensure compliance with employment regulations
- Assist in employee engagement and retention initiatives

Customer Success Manager

- Manage client relationships and ensure customer satisfaction
- Support client retention and long-term engagement strategies
- Identify opportunities for service expansion and upselling
- Coordinate feedback and continuous service improvement

Finance/Accounting Specialist

- Manage financial reporting, bookkeeping, and accounting processes
- Support budgeting and financial planning activities
- Ensure tax compliance and regulatory reporting
- Monitor financial performance and support decision-making

7.0 Financial Summary

The financial plan for E-IT Technologies will be a critical analysis of the company's financial projections, including revenue, expenses, and overall financial performance. It will offer a comprehensive overview of the expected financial trajectory over a specific period of time and determine the company's financial feasibility. The plan will encompass essential aspects such as startup funding, profit and loss, cash flow, and balance sheet. The financial plan will play a crucial role in determining the company's success and will help in making informed decisions to ensure that the company achieves its financial objectives.

7.1 Break-even Analysis

The break-even analysis for E-IT Technologies identifies the level of revenue required for the company to cover its fixed operating costs and reach financial sustainability. Based on the current financial projections, the company is expected to reach its break-even point at an **estimated monthly revenue of $13,587**.

This projection reflects the company’s lean operational structure during its initial phase, with controlled expenses and a gradual increase in revenue as market presence and client acquisition efforts develop.

This analysis is based on the following key assumption:

• **Estimated Monthly Fixed Costs: $12,500, including payroll**, administrative expenses, office-related costs, and other recurring operational expenditures required to maintain business activities.

Reaching the break-even point represents an important milestone for E-IT Technologies, as it indicates the transition from an initial investment phase to a self-sustaining operational model. Given the company’s projected Year 1 revenue of $180,000, the business is expected to surpass this threshold during its first year of operations, with projected monthly sales exceeding the break-even level from the fifth month onward.

This break-even level provides a practical benchmark for revenue planning and cost management, allowing the company to maintain financial discipline while executing its growth strategy. As revenues increase beyond this point, E-IT Technologies will be able to support additional hiring, expand service offerings, and reinvest in business development initiatives.

7.1.1 Break-even Analysis Chart

Break-even Analysis	
Monthly Revenue Break-even	$13,587
Assumptions:	
Estimated Monthly Fixed Cost	**$12,500**

7.2 Profit and Loss Assumptions

E-IT Technologies has developed a disciplined and scalable financial model to support its expansion in SAP consulting, system integration, electronic invoicing automation, custom development, and SaaS-based solutions. A significant portion of the company's operating budget is allocated to building and maintaining a highly qualified technical and consulting workforce, which is essential for delivering specialized, high-value enterprise solutions. At the same time, the company maintains a controlled cost structure to ensure financial sustainability during its early-stage operations.

The company's revenue projections reflect a conservative and realistic growth trajectory. Total sales are forecasted to increase from $180,000 in Year 1 to $1,300,000 by Year 5, driven by gradual client acquisition, expansion of service offerings, and increased market penetration across the United States. Direct costs of sales are projected to increase proportionally with revenue, rising from $14,400 in Year 1 to $104,000 in Year 5, while maintaining operational efficiency.

E-IT Technologies is expected to maintain a stable gross margin of approximately 92% throughout the five-year period, reflecting the company's high-value, service-based model and efficient delivery structure. Gross margin is projected to grow from $165,600 in Year 1 to $1,196,000 in Year 5, supported by increasing demand for consulting, integration, and scalable solutions.

Operating expenses, including payroll, rent, insurance, marketing, utilities, accounting, outsourced technical and marketing services, and administrative costs, are projected to increase from $150,000 in Year 1 to $716,046 in Year 5. In Year 1, this structure includes the engagement of a specialized outsourced services firm responsible for supplementary technical delivery and marketing execution, whose functions will be progressively internalized from Year 2 onward through the company's hiring plan. This growth reflects the company's planned workforce expansion, increased operational capacity, and continued investment in business development and infrastructure, all aligned with revenue growth.

Profit before interest and taxes is expected to grow from $15,600 in Year 1 to $479,954 in Year 5, reflecting a disciplined cost structure from the first year of operations followed by increasing operational leverage. EBITDA follows the same trajectory, indicating improving profitability and strong operational performance as the business scales.

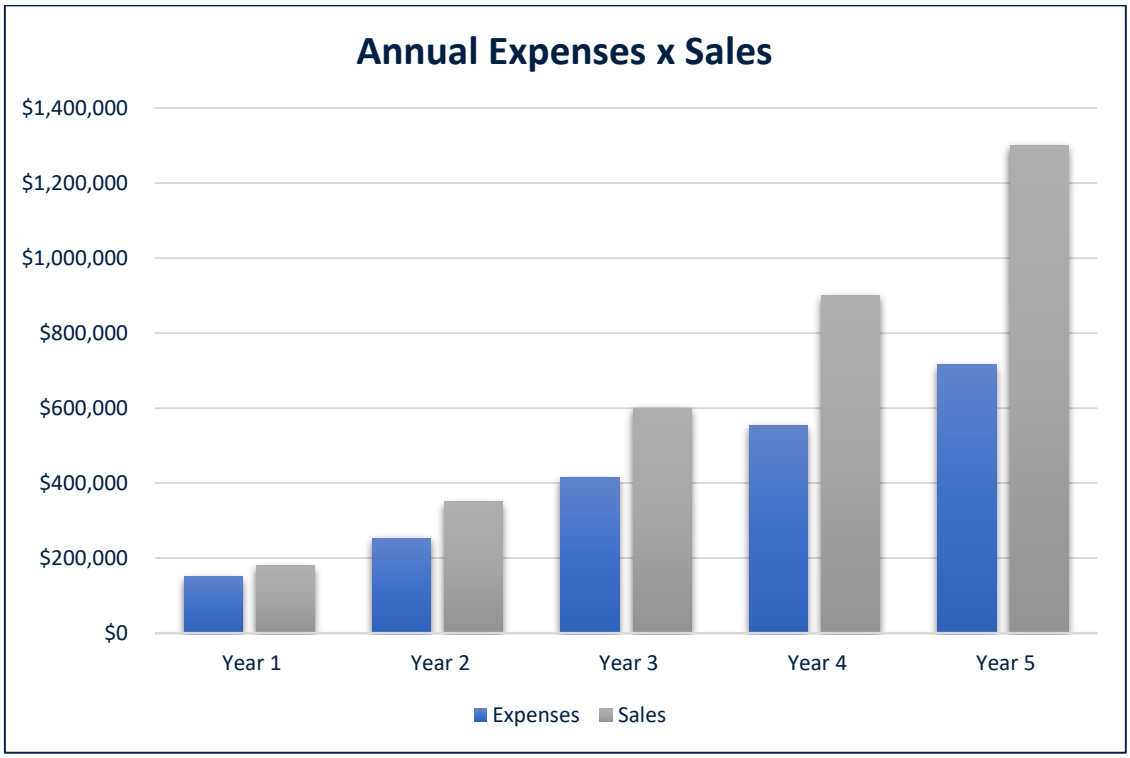
After accounting for federal and state tax obligations, net profit is projected to grow from $11,388 in Year 1 to $350,367 in Year 5. Profitability begins in Year 1 and increases steadily as revenue grows and fixed costs are absorbed. This progression demonstrates a realistic and sustainable financial model, consistent with a phased market entry strategy.

Overall, these profit and loss assumptions confirm that E-IT Technologies is positioned to achieve long-term profitability while scaling its operations in a controlled and responsible manner. The company's financial structure supports gradual growth, efficient cost management, and reinvestment into workforce expansion and service development.

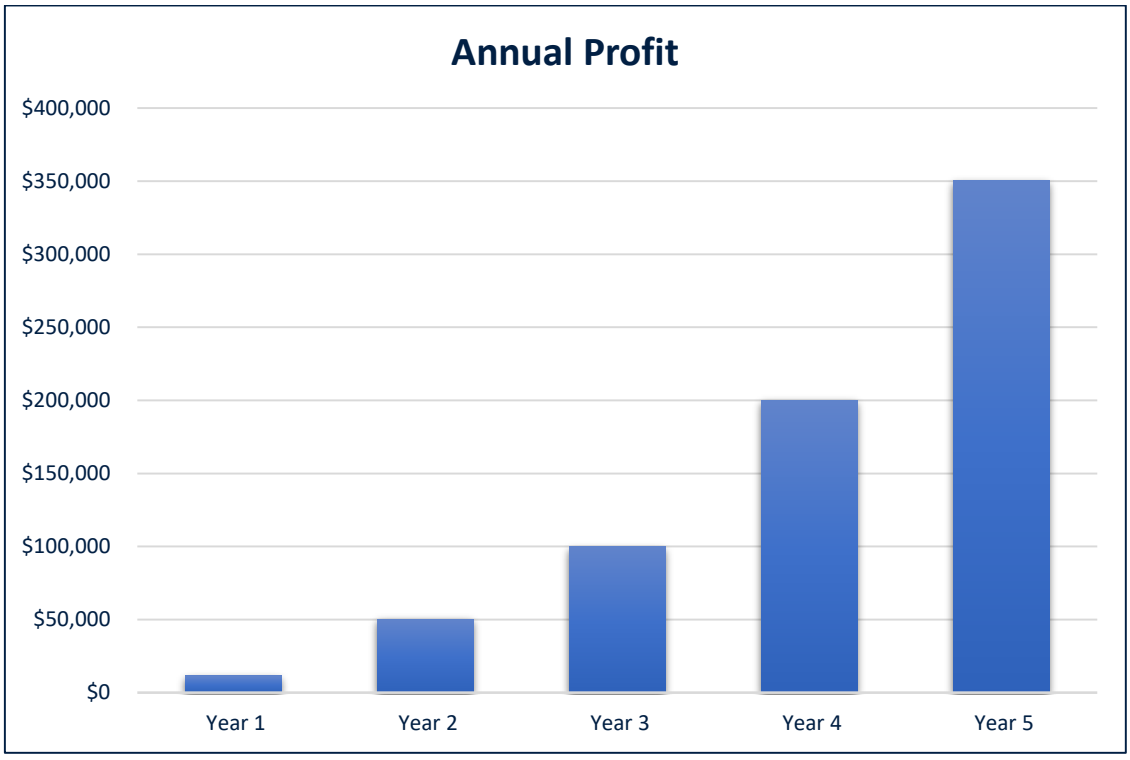
7.2.1 Annual Profit and Loss Table

Pro Forma Profit and Loss					
	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	$180,000	$350,000	$600,000	$900,000	$1,300,000
Direct Cost of Sales	$14,400	$28,000	$48,000	$72,000	$104,000
Other Costs of Sales	$0	$0	$0	$0	$0
Total Cost of Sales	$14,400	$28,000	$48,000	$72,000	$104,000
Gross Margin	$165,600	$322,000	$552,000	$828,000	$1,196,000
Gross Margin %	92.00%	92.00%	92.00%	92.00%	92.00%
Expenses					
Payroll	$93,000	$216,000	$376,000	$513,000	$668,000
Rent	$18,000	$18,250	$18,540	$19,096	$22,915
Insurance	$3,000	$3,000	$3,150	$3,308	$3,473
Marketing/Promotion	$4,800	$11,750	$12,600	$13,230	$15,876
Utilities/Internet/Phone	$1,920	$2,604	$2,765	$3,318	$3,981
Accountant	$1,200	$1,500	$1,800	$1,800	$1,800
Outsourced Technical and Marketing Services	$28,080	$0	$0	$0	$0
Total Operating Expenses	$150,000	$253,104	$414,855	$553,751	$716,046
Profit Before Interest and Taxes	$15,600	$68,896	$137,145	$274,249	$479,954
EBITDA	$15,600	$68,896	$137,145	$274,249	$479,954
Interest Expense	$0	$0	$0	$0	$0
Taxes Incurred	$4,212	$18,602	$37,029	$74,047	$129,588
Net Other Income	$0	$0	$0	$0	$0
Net Profit	$11,388	$50,294	$100,116	$200,201	$350,367
Net Profit/Sales	**6.33%**	**14.37%**	**16.69%**	**22.24%**	**26.95%**

7.2.2 Annual Expenses x Sales Chart



7.2.3 Annual Profit Chart



7.3 Cash Flow Assumptions

E-IT Technologies has developed a disciplined Pro Forma Cash Flow strategy that reflects a realistic and structured financial foundation, ensuring appropriate liquidity management throughout the five-year projection period. The company's cash flow model is based entirely on operating performance, with no reliance on external financing, debt instruments, or non-operational income sources.

Cash inflows are derived exclusively from core business operations. In Year 1, total cash received from operations is projected at $180,000, divided evenly between cash sales ($90,000) and collections from receivables ($90,000). This structure reflects a conservative and balanced revenue collection approach. As the company expands its client base and service portfolio, total cash inflows are expected to grow steadily, reaching $1,300,000 by Year 5. No additional inflows from borrowing, investments, or asset sales are anticipated, reinforcing the company's commitment to organic growth.

Operational expenditures represent the primary cash outflows and are directly aligned with the company's hiring plan and operational scaling strategy. Cash spending, primarily related to payroll, is projected to increase from $93,000 in Year 1 to $668,000 in Year 5, reflecting workforce expansion and increasing service capacity. Bill payments, including administrative expenses, marketing, utilities, outsourced services, and professional services, are expected to rise from $71,803 in Year 1 to $273,839 in Year 5. As a result, total cash spent on operations is projected to grow from $164,803 in Year 1 to $941,839 by Year 5.

Additional cash outflows include dividend distributions to ownership, beginning at $20,000 in Year 1 and increasing to $100,000 by Year 5, in line with profitability growth and long-term capital discipline. Consequently, total cash expenditures are projected to increase from $184,803 in Year 1 to $1,041,839 in Year 5.

Net cash flow is projected to be marginally negative in Year 1 at ($4,803), reflecting the dividend distribution made at the end of the first year of operations. From Year 2 onward, cash flow becomes positive, increasing to $258,161 by Year 5, demonstrating improving operational efficiency and revenue scalability.

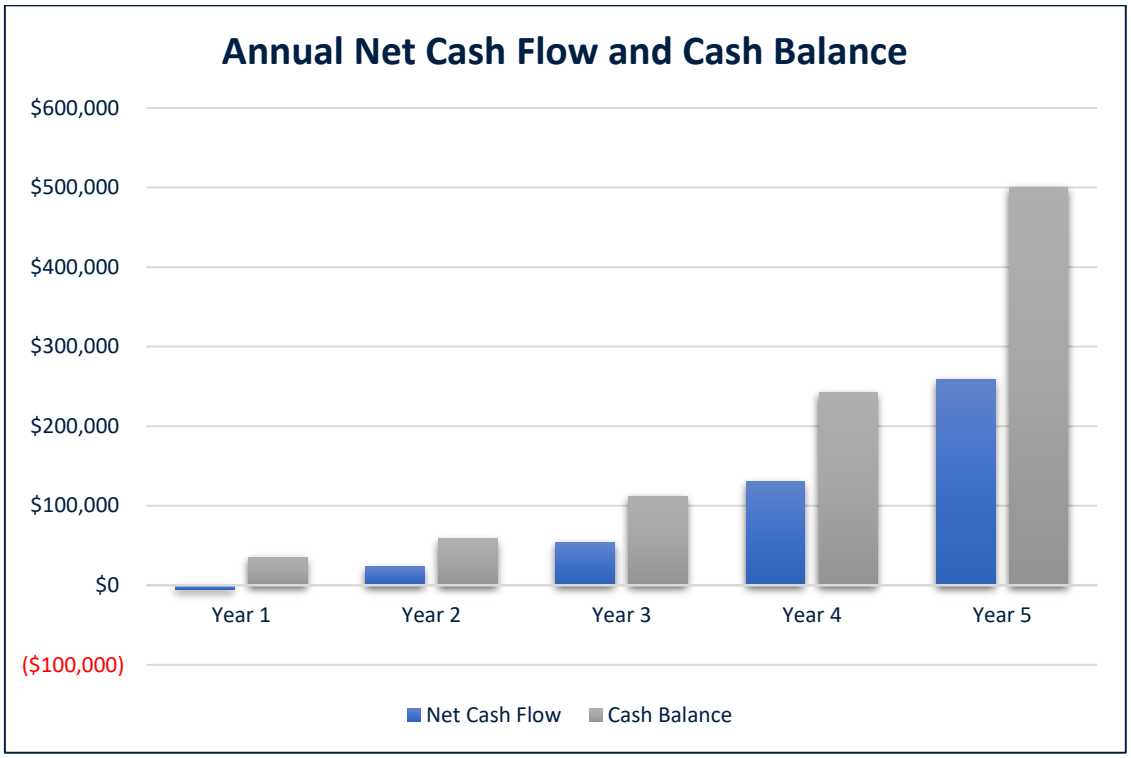
As a result of this progression, the company's cash balance is projected to remain positive throughout the entire projection period, starting at $35,197 in Year 1 and growing consistently to $500,513 by Year 5. This trajectory reflects the company's strengthened initial capitalization, which provides adequate liquidity during the ramp-up phase while operations scale.

Overall, the cash flow assumptions demonstrate a realistic and disciplined financial model, with controlled early-stage risk and strong long-term liquidity generation. The company's ability to maintain positive liquidity from its first year of operations reinforces its operational viability and capacity to sustain growth through internally generated resources.

7.3.1 Annual Cash Flow Table

Pro Forma Cash Flow					
	Year 1	Year 2	Year 3	Year 4	Year 5
Cash Received					
Cash from Operations					
Cash Sales	$90,000	$175,000	$300,000	$450,000	$650,000
Cash from Receivables	$90,000	$175,000	$300,000	$450,000	$650,000
Subtotal Cash from Operations	$180,000	$350,000	$600,000	$900,000	$1,300,000
Additional Cash Received					
Non-Operating (Other) Income	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Received	$0	$0	$0	$0	$0
New Current Borrowing	$0	$0	$0	$0	$0
New Other Liabilities (interest-free)	$0	$0	$0	$0	$0
New Long-term Liabilities	$0	$0	$0	$0	$0
Sales of Other Current Assets	$0	$0	$0	$0	$0
Sales of Long-term Assets	$0	$0	$0	$0	$0
New Investment Received	$0	$0	$0	$0	$0
Subtotal Cash Received	$180,000	$350,000	$600,000	$900,000	$1,300,000
Expenditures	Year 1	Year 2	Year 3	Year 4	Year 5
Expenditures from Operations					
Cash Spending	$93,000	$216,000	$376,000	$513,000	$668,000
Bill Payments	$71,803	$80,635	$120,582	$181,628	$273,839
Subtotal Spent on Operations	$164,803	$296,635	$496,582	$694,628	$941,839
Additional Cash Spent					
Non-Operating (Other) Expense	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Paid Out	$0	$0	$0	$0	$0
Principal Repayment of Current Borrowing	$0	$0	$0	$0	$0
Other Liabilities Principal Repayment	$0	$0	$0	$0	$0
Long-term Liabilities Principal Repayment	$0	$0	$0	$0	$0
Purchase Other Current Assets	$0	$0	$0	$0	$0
Purchase Long-term Assets	$0	$0	$0	$0	$0
Dividends	$20,000	$30,000	$50,000	$75,000	$100,000
Subtotal Cash Spent	$184,803	$326,635	$546,582	$769,628	$1,041,839
Net Cash Flow	($4,803)	$23,365	$53,418	$130,372	$258,161
Cash Balance	**$35,197**	**$58,562**	**$111,980**	**$242,352**	**$500,513**

7.3.2 Annual Net Cash Flow and Cash Balance Chart



7.4 Balance Sheet Assumptions

Over the five-year projection period, E-IT Technologies' Pro Forma Balance Sheet reflects a realistic and disciplined financial trajectory, characterized by an initial investment phase followed by gradual financial stabilization and equity growth. The company's balance sheet structure emphasizes controlled risk, operational scalability, and progressive capital strengthening as revenues increase.

On the asset side, E-IT Technologies maintains a highly liquid structure, with cash as its primary current asset. Cash balances are projected to remain positive throughout the projection period, starting at $35,197 in Year 1 and reaching $58,562 in Year 2, supported by the company's strengthened initial capitalization. As the company scales its operations and consolidates profitability, cash balances grow to $111,980 in Year 3 and reach $500,513 by Year 5. This progression reflects a well-capitalized market entry, in which initial expenditures are fully supported by adequate funding while revenues expand.

Accounts receivable, inventory, and other current assets are projected to remain at zero throughout the period, consistent with a service-based business model with no inventory requirements and efficient billing cycles. As a result, total current assets directly mirror the company's cash position over time.

The company does not project the accumulation of long-term or fixed assets during the five-year period, maintaining a lean and asset-light operational model. No depreciation is recorded, reflecting the limited reliance on capital-intensive infrastructure and the focus on service delivery through human capital and technology tools.

On the liabilities side, E-IT Technologies maintains a conservative financial structure with minimal obligations. Accounts payable represent the company's only liability and are projected to increase gradually from $3,809 in Year 1 to $23,148 in Year 5, reflecting increased operational activity and vendor relationships. The company does not assume any short-term or long-term debt, eliminating exposure to financial leverage and interest-related risks.

On the capital side, paid-in capital remains constant at $200,000, providing the initial funding base for operations. Retained earnings reflect the initial startup expenditures and the company's dividend distribution policy, beginning at ($180,000) in Year 1. As profitability strengthens over the projection period, retained earnings progressively recover, reaching ($73,001) by Year 5.

Annual earnings follow a positive trajectory, starting at $11,388 in Year 1 and growing consistently to $350,367 in Year 5, driven by revenue expansion and operational efficiency.

As a result, total capital remains positive throughout the projection period, starting at $31,388 in Year 1 and growing to $477,366 by Year 5. Net worth follows the same pattern, reflecting a financially stable and consistently profitable operation.

Overall, this balance sheet structure demonstrates realistic and well-managed financial progression. The company's ability to sustain profitability from its first year of operations, maintain low liabilities, and build equity over time highlights its financial discipline, operational viability, and long-term sustainability. This trajectory supports the company's capacity to expand its operations, invest in workforce growth, and strengthen its position within the U.S. market.

7.4.1 Annual Balance Sheet Table

Pro Forma Balance Sheet					
	Year 1	Year 2	Year 3	Year 4	Year 5
Assets					
Current Assets					
Cash	$35,197	$58,562	$111,980	$242,352	$500,513
Accounts Receivable	$0	$0	$0	$0	$0
Inventory	$0	$0	$0	$0	$0
Other Current Assets	$0	$0	$0	$0	$0
Total Current Assets	$35,197	$58,562	$111,980	$242,352	$500,513
Long-term Assets					
Long-term Assets	$0	$0	$0	$0	$0
Accumulated Depreciation	$0	$0	$0	$0	$0
Total Long-term Assets	$0	$0	$0	$0	$0

Total Assets	$35,197	$58,562	$111,980	$242,352	$500,513
Liabilities and Capital	Year 1	Year 2	Year 3	Year 4	Year 5
Current Liabilities					
Accounts Payable	$3,809	$6,880	$10,182	$15,353	$23,148
Current Borrowing	$0	$0	$0	$0	$0
Other Current Liabilities	$0	$0	$0	$0	$0
Subtotal Current Liabilities	$3,809	$6,880	$10,182	$15,353	$23,148
Long-term Liabilities	$0	$0	$0	$0	$0
Total Liabilities	$3,809	$6,880	$10,182	$15,353	$23,148
Paid-in Capital	$200,000	$200,000	$200,000	$200,000	$200,000
Retained Earnings	($180,000)	($198,612)	($198,318)	($173,202)	($73,001)
Earnings	$11,388	$50,294	$100,116	$200,201	$350,367
Total Capital	$31,388	$51,682	$101,798	$226,999	$477,366
Total Liabilities and Capital	$35,197	$58,562	$111,980	$242,352	$500,513
Net Worth	**$31,388**	**$51,682**	**$101,798**	**$226,999**	**$477,366**

8.0 Mr. Luciano Aparecido de Souza's National-level Impact

E-IT Technologies is positioned to generate meaningful contributions to the United States by aligning its technical consulting and integration services with current federal government priorities, particularly in areas related to critical infrastructure resilience, digital systems security, secure economic competitiveness, and workforce capability building. Through specialized services that strengthen enterprise IT systems, improve operational continuity, and foster secure digital practices, the company supports national objectives that are reflected in contemporary federal policy.

1. Supporting National Cybersecurity and Digital Infrastructure Resilience

The current U.S. administration has reaffirmed cybersecurity as a **national priority**, issuing executive actions aimed at protecting the nation's digital infrastructure from evolving threats. New executive orders emphasize defending digital systems and critical infrastructure against foreign attacks, while promoting secure, resilient technology practices across public and private sectors. [xxxviii]

E-IT Technologies' solutions, particularly in secure system integration, clean-core SAP modernization, and governance enablement, help organizations strengthen the security, stability, and compliance of complex IT environments. These services support mitigation of system vulnerabilities and contribute to broader national objectives of securing critical infrastructure and reinforcing digital defenses.

By improving the integration and governance of enterprise systems used by strategic industries (e.g., energy, manufacturing, logistics, and financial services), the company enhances private-sector readiness in managing cyber risks and operational disruptions, consistent with federal cybersecurity goals.

National Relevance

- Aligns with the U.S. administration's cybersecurity strengthening efforts focused on defending digital infrastructure against foreign threats.
- Helps private firms adopt secure, modern IT practices that reduce systemic vulnerabilities and contribute to national cyber resilience.

2. Enhancing Technological and Operational Resilience in Critical Sectors

U.S. policy under the current administration continues to emphasize economic security and the resilience of supply chains and critical infrastructure, as reflected in national security strategy discussions that prioritize resilient networks and systems as essential for economic stability and national defense.

E-IT Technologies directly contributes to these policy objectives by helping U.S. enterprises optimize mission-critical IT landscapes. Its SAP logistics optimization, compliance automation, and integrated system solutions help reduce operational risk, improve responsiveness to regulatory change, and ensure continuity of service delivery, especially in sectors where system failures could disrupt national supply chains or essential services.[xxxix]

National Relevance

- Supports federal concerns over resilient infrastructure that underpins economic and security interests.
- Provides U.S. firms with tools to modernize operational systems, improving reliability and competitiveness.

3. Supporting U.S. Workforce and Technology Capacity

Despite ongoing debates about the federal role in workforce development, broad bipartisan concern exists regarding the availability of skilled technology professionals in the United States. Public and private sector groups alike advocate for expanded training and skills development in areas like systems integration, secure computing, and enterprise governance, areas where E-IT Technologies has deep expertise.[xl]

Through its consulting engagements, training programs, and enablement services, the company helps upskill U.S. technical talent and transfers knowledge across disciplines critical to digital infrastructure and operational excellence. This contributes to a more capable workforce within sectors that sustain core U.S. economic activity.

National Relevance

- Helps address demand for advanced technical skills in secure IT integration, governance, and enterprise systems.
- Supports development of U.S. human capital in technology and complex digital operations.

4. Aligning with Broader Economic and Technological Goals

The current U.S. administration's industrial and economic priorities emphasize investment in strategic sectors, infrastructure resilience, and domestic capability strengthening. This includes public discourse around reducing reliance on foreign supply chains and expanding domestic capacity for critical technologies.[xli]

While E-IT Technologies operates primarily in technology consulting rather than direct manufacturing, its services play a foundational role in enabling U.S. companies to modernize and scale secure enterprise technology platforms, thereby supporting economic competitiveness, operational resilience, and innovation capacity within the technology ecosystem.

National Relevance

- Enhances the technological readiness of U.S. firms competing in global markets.
- Contributes to economic security by strengthening private sector systems that underpin the broader national economy.

5. Supporting the National Transition to Electronic Invoicing and Digital Tax Administration

The U.S. federal government has taken concrete steps toward electronic invoicing and digital tax administration. OMB Memorandum M-15-19 required federal agencies to adopt electronic invoicing for procurement, the U.S. Department of the Treasury operates the Invoice Processing Platform, and the Federal Reserve supported the Business Payments Coalition E-invoice Exchange Market Pilot, which resulted in the Digital Business Networks Alliance, the open network for business-to-business e-invoice exchange in the United States. The Internal Revenue Service has likewise expanded mandatory electronic filing and launched the Paperless Processing Initiative to digitize tax administration.

Mr. Souza's more than 15 years of experience designing and operating electronic invoicing automation within Brazil's NF-e framework,[xlii] one of the world's first nationwide mandatory e-invoicing systems, represents directly transferable expertise for this transition. As adoption expands in the United States and international mandates such as the European Union's ViDA package take effect, E-IT Technologies' solutions for e-invoice automation, XML validation, and ERP-integrated compliance will support U.S. enterprises in adopting more efficient, transparent, and audit-ready invoicing processes.

National Relevance

- Aligns with federal efficiency objectives reflected in OMB Memorandum M-15-19, the Treasury Invoice Processing Platform, and the Federal Reserve-supported e-invoice exchange network.
- Strengthens U.S. tax compliance infrastructure and prepares U.S. businesses, particularly multinationals subject to European mandates, for the global shift toward structured electronic invoicing.

These contributions establish the company's services as not only commercially viable but also nationally meaningful, reinforcing U.S. resilience, productivity, and competitiveness in areas essential to national economic and security interests.

The strengthening United States economy in recent years has nurtured many opportunities for entrepreneurs, with the number of small businesses in the U.S. on the rise. In 2023, the number of small businesses in the US reached 33.3 million, making up nearly all (99.9 percent) US businesses.

Small enterprises play a significant role in the U.S. economy and are vital to economic development and job creation. Although the majority of small businesses hire fewer than 100 employees, they are responsible for millions of new jobs created over the past few years. In fact, there are currently 61.6 million small business employees in the US, which make up approximately half (45.9 percent) of the U.S. workforce.[xliii]

9.0 Indirect jobs creation - Economic Policy Institute

Each industry has backward linkages to economic sectors that provide the materials needed for the industry's output, just as each industry has forward linkages to the economic sectors where the industry's workers spend their income. Therefore, in addition to the jobs directly supported by an industry, a large number of indirect jobs may also be supported by that industry. The subtraction or addition of jobs and output in industries with strong backward and forward linkages to other economic sectors can cause large ripple effects.

According to the national job multipliers published by the Economy Policy Institute (EPI) on January 23, 2019,[xliv] 100 direct jobs in the Computer system design, and related services industry generate a total of 283.4 total indirect jobs, as demonstrated in the following table:

Employment multipliers per 100 direct jobs, all private-sector industries

	Industry	Direct jobs	Supplier jobs*	Induced jobs**	Total indirect jobs
	Professional, scientific, and technical services				
125	Legal services	100.0	89.2	111.3	200.5
126	Accounting, tax preparation, bookkeeping, and payroll services	100.0	52.0	81.3	133.4
127	Architectural, engineering, and related services	100.0	90.0	114.1	204.1
128	Specialized design services	100.0	67.5	97.4	164.9
129	Computer systems design and related services	100.0	134.1	149.3	283.4
130	Management, scientific, and technical consulting services	100.0	91.1	116.5	207.6
131	Scientific research and development services	100.0	519.3	323.7	842.9
132	Advertising, public relations, and related services	100.0	460.9	270.7	731.6
133	Other professional, scientific, and technical services	100.0	70.8	83.6	154.3

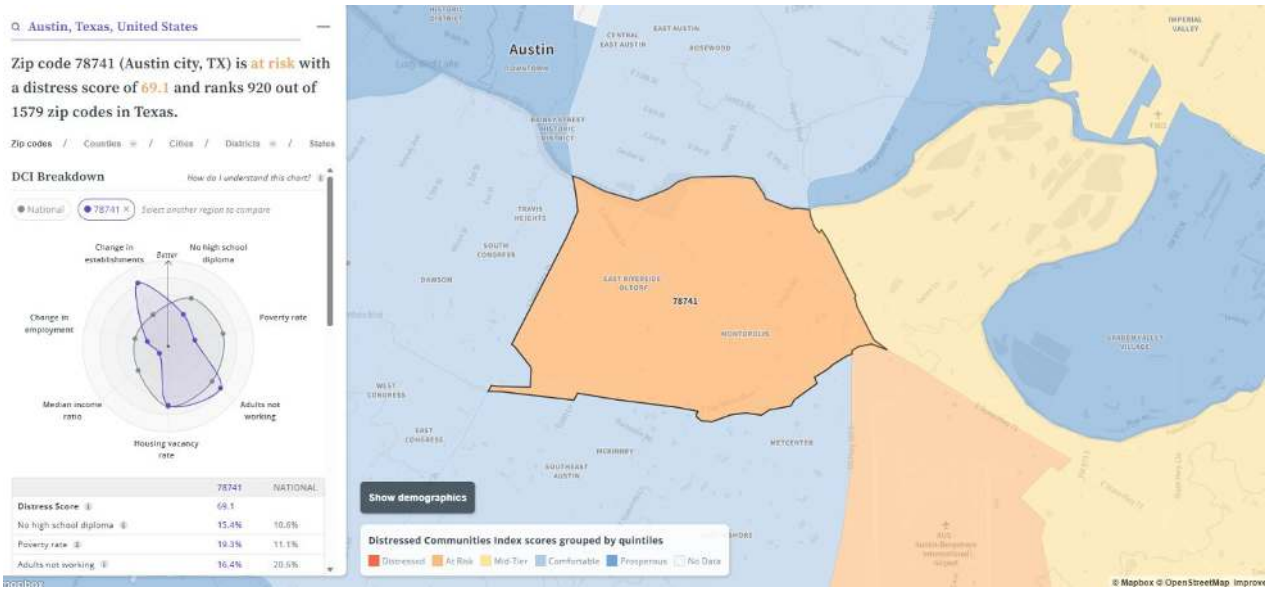
Since Mr. Souza will create 12 direct jobs by the end of Year 5, the total number of indirect jobs to be generated in the same period will reach 34 according to the multipliers provided by EPI. In addition to its in-house team, E-IT Technologies will hire a number of independent contractors on a project basis, including legal professionals and technicians. Additionally, the company will mediate in the hiring of professionals that will perform services that are deemed to be required. Therefore, the company will stimulate the employment of a number of workers of different profiles. Furthermore, the company will hire an outsourced marketing company to develop its website and work with marketing campaigns.

The direct and indirect job creation by E-IT Technologies, as well as the utilization of independent contractors and outsourced services, will have a significant positive impact on the local and national economy, fostering job growth, generating income, and contributing to overall economic prosperity.

In conclusion, E-IT Technologies' expansion plans, under the leadership of Mr. Luciano Aparecido de Souza, encompass the creation of direct and indirect employment opportunities, the payment of substantial taxes, and the utilization of local resources and services. By contributing to job creation, tax revenue, and economic growth, E-IT Technologies aims to make a lasting and positive impact on both the local community and the broader U.S. economy.

9.1 Distressed Communities

Austin, Texas is classified as an "*at-risk*" community according to the Distressed Communities Index (DCI), with a distress score of 69.1 and a ranking of 920 out of 1,579 ZIP codes in Texas. This designation reflects a combination of socioeconomic pressures that impact education levels, income distribution, employment trends, and long-term economic mobility. Understanding these conditions is essential for designing business strategies that generate both economic value and measurable community impact.



Demographic and Socioeconomic Profile

- **Distress Score and Economic Indicators:** A DCI score of 69.1 places ZIP code 78741 in the "at-risk" category, indicating sustained economic vulnerability relative to state and national benchmarks. Key contributing factors include elevated poverty levels, income disparities, and recent employment contraction, despite Austin's broader economic growth.
- **Education and Workforce:** Approximately 15.4% of adults lack a high school diploma, compared to 10.6% nationally, highlighting gaps in foundational education. At the same time, the area demonstrates educational diversity: 26.2% hold a high school diploma, 28.2% have some college education, and 35.0% possess a bachelor's degree or higher. While this reflects the presence of a skilled talent segment, 16.4% of adults are not working, suggesting underutilized labor capacity and opportunities for workforce reintegration and upskilling initiatives.
- **Poverty and Income:** The poverty rate is 19.3%, substantially higher than the national average of 11.1%. The median income ratio is 68.0% of the national median, underscoring income inequality and reduced household purchasing power. These conditions directly affect housing stability, access to services, and long-term economic resilience.
- **Housing and Economic Stability:** The housing vacancy rate of 7.2% is slightly above the national average of 7.0%, reflecting moderate residential and commercial instability. Employment in the area declined by 6.8%, contrasting with national employment growth of 5.1%, which signals recent economic stress. Conversely, business establishments increased by 24.7%, significantly outperforming the national average of 5.0%, indicating entrepreneurial activity and potential for localized economic recovery.

- **Racial, Ethnic, and National Diversity:** ZIP code 78741 is characterized by strong demographic diversity. The population includes 34.8% Non-Hispanic White, 49.1% Hispanic or Latino, 8.2% Black or African American, 4.1% Asian or Pacific Islander, and 3.6% identifying as other races or multiracial. Additionally, 22.8% of residents are foreign-born, compared to 13.9% nationally, highlighting the importance of inclusive, multilingual, and culturally responsive economic strategies.

Business Implications

- **Market Potential:** Elevated poverty levels and below-average median income indicate demand for accessible, cost-efficient, and value-driven services, particularly in areas related to employment, education, technology enablement, and operational efficiency for local businesses.
- **Workforce Development Opportunities:** The coexistence of underemployment and a meaningful share of residents with higher education creates opportunities for targeted training, reskilling, and professional enablement programs. Businesses that invest in workforce development can help bridge employment gaps while strengthening their own talent pipelines.
- **Community Engagement and Inclusion:** The area's significant Hispanic and foreign-born population underscores the importance of culturally inclusive business practices, multilingual engagement, and partnerships with local educational and community organizations to maximize social and economic impact.
- **Economic Incentives and Public Programs:** As an at-risk community, ZIP code 78741 may qualify for various federal and state economic development incentives, including:
    - **Opportunity Zones** (U.S. Department of the Treasury)
    - **Community Development Block Grant (CDBG) Program** (U.S. Department of Housing and Urban Development – HUD)
    - **Economic Development Administration (EDA) assistance programs**

These initiatives are designed to attract investment, stimulate job creation, and promote sustainable development in economically vulnerable areas.

Strategic Opportunity

Although ZIP code 78741 faces measurable socioeconomic challenges, it also presents strategic opportunities for impactful investment. The combination of business formation growth, workforce diversity, and proximity to Austin's broader technology and innovation ecosystem creates a favorable environment for companies willing to align commercial objectives with community needs.

APPENDIX

Monthly Sales Forecast Table

Sales Forecast													
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Sales													
SAP Consulting & Process Optimization Services		$5,000	$6,000	$6,000	$7,000	$7,500	$7,500	$8,000	$8,000	$8,500	$8,500	$9,000	$9,000
ERP Integration & Automation Solutions		$0	$1,000	$2,000	$2,500	$3,000	$3,000	$3,500	$3,500	$3,500	$4,000	$4,000	$5,000
Electronic Invoicing & Compliance Solutions		$1,000	$1,000	$1,500	$1,500	$2,000	$2,000	$2,000	$2,500	$2,500	$3,000	$3,000	$3,000
Custom SAP Extensions & Application Development		$0	$0	$500	$1,000	$1,000	$1,500	$1,500	$1,500	$1,500	$2,000	$2,000	$2,500
SaaS / Subscription-Based Solutions		$0	$0	$0	$0	$500	$1,000	$1,000	$1,500	$2,000	$2,500	$3,000	$3,500
Total Sales		$6,000	$8,000	$10,000	$12,000	$14,000	$15,000	$16,000	$17,000	$18,000	$20,000	$21,000	$23,000
Direct Cost of Sales		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
SAP Consulting & Process Optimization Services	8%	$400	$480	$480	$560	$600	$600	$640	$640	$680	$680	$720	$720
ERP Integration & Automation Solutions	8%	$0	$80	$160	$200	$240	$240	$280	$280	$280	$320	$320	$400
Electronic Invoicing & Compliance Solutions	8%	$80	$80	$120	$120	$160	$160	$160	$200	$200	$240	$240	$240
Custom SAP Extensions & Application Development	8%	$0	$0	$40	$80	$80	$120	$120	$120	$120	$160	$160	$200
SaaS / Subscription-Based Solutions	8%	$0	$0	$0	$0	$40	$80	$80	$120	$160	$200	$240	$280
Subtotal Direct Cost of Sales		**$480**	**$640**	**$800**	**$960**	**$1,120**	**$1,200**	**$1,280**	**$1,360**	**$1,440**	**$1,600**	**$1,680**	**$1,840**

Monthly Personnel Plan Table

Personnel Plan												
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Founder, General Manager and Principal SAP Solution Architect		$0	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$6,000
Business Development Manager		$0	$0	$0	$0	$0	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500
Administrative/Operations Assistant – Part-time		$0	$0	$0	$0	$0	$0	$0	$2,500	$2,500	$2,500	$2,500	$2,500
SAP/ERP Consultant		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales & Marketing Specialist		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Project Manager		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Technical Support Engineer		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Senior Solution Architect		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HR/Recruitment Specialist		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Customer Success Manager		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Finance/Accounting Specialist		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total People		1	1	1	1	1	2	2	3	3	3	3	3
Total Payroll		**$0**	**$5,000**	**$5,000**	**$5,000**	**$5,000**	**$8,500**	**$8,500**	**$11,000**	**$11,000**	**$11,000**	**$11,000**	**$12,000**

Monthly Profit and Loss Table

Pro Forma Profit and Loss													
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Sales		$6,000	$8,000	$10,000	$12,000	$14,000	$15,000	$16,000	$17,000	$18,000	$20,000	$21,000	$23,000
Direct Cost of Sales		$480	$640	$800	$960	$1,120	$1,200	$1,280	$1,360	$1,440	$1,600	$1,680	$1,840
Other Costs of Sales		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cost of Sales		$480	$640	$800	$960	$1,120	$1,200	$1,280	$1,360	$1,440	$1,600	$1,680	$1,840
Gross Margin		$5,520	$7,360	$9,200	$11,040	$12,880	$13,800	$14,720	$15,640	$16,560	$18,400	$19,320	$21,160
Gross Margin %		92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%
Expenses													
Payroll		$0	$5,000	$5,000	$5,000	$5,000	$8,500	$8,500	$11,000	$11,000	$11,000	$11,000	$12,000
Rent		$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
Depreciation		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance		$250	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250
Marketing/Promotion		$400	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400
Utilities/Internet/Phone		$150	$150	$150	$150	$150	$150	$150	$150	$180	$180	$180	$180
Accountant	0%	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100
Outsourced Technical and Marketing Services		$2,340	$2,340	$2,340	$2,340	$2,340	$2,340	$2,340	$2,340	$2,340	$2,340	$2,340	$2,340
Total Operating Expenses		$4,740	$9,740	$9,740	$9,740	$9,740	$13,240	$13,240	$15,740	$15,770	$15,770	$15,770	$16,770
Profit Before Interest and Taxes		$780	($2,380)	($540)	$1,300	$3,140	$560	$1,480	($100)	$790	$2,630	$3,550	$4,390
EBITDA		$780	($2,380)	($540)	$1,300	$3,140	$560	$1,480	($100)	$790	$2,630	$3,550	$4,390
Interest Expense		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Taxes Incurred		$211	($643)	($146)	$351	$848	$151	$400	($27)	$213	$710	$959	$1,185
Net Other Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Profit		$569	($1,737)	($394)	$949	$2,292	$409	$1,080	($73)	$577	$1,920	$2,591	$3,205
Net Profit/Sales		**9.48%**	**-21.71%**	**-3.94%**	**7.91%**	**16.37%**	**2.73%**	**6.75%**	**-0.43%**	**3.21%**	**9.60%**	**12.34%**	**13.93%**

Monthly Cash Flow Table

Pro Forma Cash Flow												
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Cash Received													
Cash from Operations													
Cash Sales		$3,000	$4,000	$5,000	$6,000	$7,000	$7,500	$8,000	$8,500	$9,000	$10,000	$10,500	$11,500
Cash from Receivables		$3,000	$4,000	$5,000	$6,000	$7,000	$7,500	$8,000	$8,500	$9,000	$10,000	$10,500	$11,500
Subtotal Cash from Operations		$6,000	$8,000	$10,000	$12,000	$14,000	$15,000	$16,000	$17,000	$18,000	$20,000	$21,000	$23,000
Additional Cash Received													
Non-Operating (Other) Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Received	0.00%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Current Borrowing		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Other Liabilities (interest-free)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Long-term Liabilities		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales of Other Current Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales of Long-term Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Investment Received		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Cash Received		$6,000	$8,000	$10,000	$12,000	$14,000	$15,000	$16,000	$17,000	$18,000	$20,000	$21,000	$23,000
Expenditures		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Expenditures from Operations													
Cash Spending		$0	$5,000	$5,000	$5,000	$5,000	$8,500	$8,500	$11,000	$11,000	$11,000	$11,000	$12,000
Bill Payments		$2,715	$5,084	$5,066	$5,722	$6,380	$6,399	$6,256	$6,246	$6,248	$6,752	$7,244	$7,691
Subtotal Spent on Operations		$2,715	$10,084	$10,066	$10,722	$11,380	$14,899	$14,756	$17,246	$17,248	$17,752	$18,244	$19,691
Additional Cash Spent													
Non-Operating (Other) Expense		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Paid Out		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Principal Repayment of Current Borrowing		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Liabilities Principal Repayment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Long-term Liabilities Principal Repayment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchase Other Current Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchase Long-term Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dividends		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$20,000
Subtotal Cash Spent		$2,715	$10,084	$10,066	$10,722	$11,380	$14,899	$14,756	$17,246	$17,248	$17,752	$18,244	$39,691
Net Cash Flow		$3,285	($2,084)	($66)	$1,278	$2,620	$101	$1,244	($246)	$752	$2,248	$2,756	($16,691)
Cash Balance		**$43,285**	**$41,201**	**$41,135**	**$42,413**	**$45,033**	**$45,134**	**$46,378**	**$46,132**	**$46,884**	**$49,132**	**$51,888**	**$35,197**

Monthly Balance Sheet Table

Pro Forma Balance Sheet													
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Assets	Starting Balances												
Current Assets													
Cash	$40,000	$43,285	$41,201	$41,135	$42,413	$45,033	$45,134	$46,378	$46,132	$46,884	$49,132	$51,888	$35,197
Accounts Receivable	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Inventory	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Current Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Current Assets	$40,000	$43,285	$41,201	$41,135	$42,413	$45,033	$45,134	$46,378	$46,132	$46,884	$49,132	$51,888	$35,197
Long-term Assets													
Long-term Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Accumulated Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Long-term Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Assets	$40,000	$43,285	$41,201	$41,135	$42,413	$45,033	$45,134	$46,378	$46,132	$46,884	$49,132	$51,888	$35,197
Liabilities and Capital		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Current Liabilities													
Accounts Payable	$0	$2,716	$2,369	$2,697	$3,026	$3,354	$3,046	$3,210	$3,037	$3,212	$3,540	$3,705	$3,809
Current Borrowing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Current Liabilities	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Current Liabilities	$0	$2,716	$2,369	$2,697	$3,026	$3,354	$3,046	$3,210	$3,037	$3,212	$3,540	$3,705	$3,809
Long-term Liabilities	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Liabilities	$0	$2,716	$2,369	$2,697	$3,026	$3,354	$3,046	$3,210	$3,037	$3,212	$3,540	$3,705	$3,809
Paid-in Capital	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
Retained Earnings	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($160,000)	($180,000)
Earnings	$0	$569	($1,168)	($1,562)	($613)	$1,679	$2,088	$3,168	$3,095	$3,672	$5,592	$8,183	$11,388
Total Capital	$40,000	$40,569	$38,832	$38,438	$39,387	$41,679	$42,088	$43,168	$43,095	$43,672	$45,592	$48,183	$31,388
Total Liabilities and Capital	$40,000	$43,285	$41,201	$41,135	$42,413	$45,033	$45,134	$46,378	$46,132	$46,884	$49,132	$51,888	$35,197
Net Worth	**$40,000**	**$40,569**	**$38,832**	**$38,438**	**$39,387**	**$41,679**	**$42,088**	**$43,168**	**$43,095**	**$43,672**	**$45,592**	**$48,183**	**$31,388**

References

[i] https://www.weforum.org/stories/2025/07/strengthening-manufacturing-supply-chains-new-industrial-era/
[ii] https://www.mitre.org/sites/default/files/2024-11/PR-24-01821-23-Toward-Resiliency-US-Critical-Supply-Chains.pdf
[iii] https://strategy.data.gov/
[iv] https://obamawhitehouse.archives.gov/sites/default/files/omb/memoranda/2015/m-15-19.pdf
[v] https://www.cisa.gov/cybersecurity-strategic-plan
[vi] https://www.bls.gov/ooh/computer-and-information-technology/home.htm
[vii] https://www.bls.gov/productivity/
[viii] https://www.irs.gov/businesses/small-businesses-self-employed/recordkeeping
[ix] https://fiscal.treasury.gov/payments-from-government/invoice-processing-platform-ipp
[x] https://fedpaymentsimprovement.org/news/press-releases/frs-bpc-announce-two-industry-efforts-propel-b2b-payments-toward-modernization/
[xi] https://dbnalliance.org/launch-digital-business-networks-alliance/
[xii] https://www.federalregister.gov/documents/2023/02/23/2023-03710/electronic-filing-requirements-for-specified-returns-and-other-documents
[xiii] https://www.irs.gov/newsroom/irs-launches-paperless-processing-initiative
[xiv] https://fedpaymentsimprovement.org/wp-content/uploads/e-invoicing-white-paper.pdf
[xv] https://www.globalbankingandfinance.com/global-supply-chain-disruptions-in-2025-causes-effects-and-resilience-strategies/
[xvi] https://www.sap.com/products/technology-platform.html
[xvii] https://www.deloitte.com/us/en/pages/consulting/articles/technology-talent-shortage.html
[xviii] https://www.sba.gov/business-guide/manage-your-business/technology
[xix] https://publications.iadb.org/en/electronic-invoicing-latin-america
[xx] https://blogs.iadb.org/efectividad-desarrollo/en/from-evidence-to-expansion-e-invoicing-in-latin-america-and-the-caribbean/
[xxi] https://www.grandviewresearch.com/horizon/outlook/data-integration-market/united-states
[xxii] https://www.fortunebusinessinsights.com/data-analytics-market-108882
[xxiii] https://www.verifiedmarketresearch.com/product/fp-a-software-market/
[xxiv] https://market.us/report/system-integration-services-market/
[xxv] https://www.pagero.com/newsroom/global-e-invoicing-market-growing-28-per-year-according-to-new-report
[xxvi] https://taxation-customs.ec.europa.eu/taxation/vat/vat-digital-age-vida_en
[xxvii] https://ec.europa.eu/digital-building-blocks/sites/spaces/DIGITAL/pages/467108886/eInvoicing+in+Germany
[xxviii] https://entreprendre.service-public.gouv.fr/actualites/A15683?lang=en
[xxix] https://my.ibisworld.com/us/en/industry/54151/performance
[xxx] https://my.ibisworld.com/us/en/industry/54151/products-and-markets
[xxxi] https://my.ibisworld.com/us/en/industry/54151/products-and-markets
[xxxii] https://en.wikipedia.org/wiki/Austin,_Texas
[xxxiii] https://www.austinchamber.com/blog/07-05-2023-high-tech-industry
[xxxiv] https://www.austinchamber.com/

[xxxv] https://opportunityaustin.com/
[xxxvi] https://opportunityaustin.com/tech-is-still-a-vital-component-of-austins-economic-competitiveness/
[xxxvii] https://www.bls.gov/regions/southwest/news-release/occupationalemploymentandwages_austin.htm
[xxxviii] https://www.whitehouse.gov/fact-sheets/2025/06/fact-sheet-president-donald-j-trump-reprioritizes-cybersecurity-efforts-to-protect-america/
[xxxix] https://www.wileyconnect.com/president-trumps-national-security-strategy-sends-messages-for-private-sector-priorities
[xl] https://www.cio.gov/policies-and-priorities/cybersecurity/
[xli] https://www.reuters.com/business/finance/jpmorgan-unveils-15-trillion-plan-boost-investments-us-strategic-industries-2025-10-13/
[xlii] https://www.nfe.fazenda.gov.br/portal/
[xliii] https://advocacy.sba.gov/wp-content/uploads/2023/11/2023-Small-Business-Economic-Profile-US.pdf
[xliv] https://www.epi.org/publication/updated-employment-multipliers-for-the-u-s-economy/

OFFICIAL AUTHORITIES AND GOVERNMENT SOURCES

1. INA § 203(b)(2), 8 U.S.C. § 1153(b)(2): Office of the Law Revision Counsel, U.S. House of Representatives.
2. 8 C.F.R. § 204.5(k): Electronic Code of Federal Regulations.
3. *Matter of Dhanasar*, 26 I&N Dec. 884 (AAO 2016): U.S. Department of Justice, Executive Office for Immigration Review.
4. *Matter of Chawathe*, 25 I&N Dec. 369 (AAO 2010), listed among DHS/AAO precedent decisions: U.S. Department of Justice, DHS/AAO/INS Decisions.
5. USCIS Policy Manual, Volume 6, Part F, Chapter 5, Advanced Degree or Exceptional Ability: U.S. Citizenship and Immigration Services.
6. USCIS Policy Alert, *Employment-Based Second Preference (EB-2) National Interest Waiver* (Jan. 15, 2025): U.S. Citizenship and Immigration Services.
7. NIST, *Strategic Plan for the Manufacturing USA Program* (2024): National Institute of Standards and Technology.
8. NISTIR 8107, *Current Standards Landscape for Smart Manufacturing Systems*: National Institute of Standards and Technology.
9. CBP, Automated Commercial Environment: U.S. Customs and Border Protection.
10. CBP, *ACE Modernization Issue Paper* (Sept. 2025): U.S. Customs and Border Protection.
11. Treasury, Invoice Processing Platform: U.S. Department of the Treasury, Bureau of the Fiscal Service.
12. Census Bureau, *Shipment of U.S. Goods Reached 12.2 Billion Tons and $18.0 Trillion* (June 26, 2025): U.S. Census Bureau.
13. BLS, Occupational Outlook Handbook, Management Analysts: U.S. Bureau of Labor Statistics.
14. BLS, Occupational Outlook Handbook, Computer Systems Analysts: U.S. Bureau of Labor Statistics.
15. BLS, Occupational Outlook Handbook, Logisticians: U.S. Bureau of Labor Statistics.
16. BLS, Occupational Outlook Handbook, Top Executives (including General and Operations Managers, SOC 11-1021): U.S. Bureau of Labor Statistics.
17. O*NET OnLine, General and Operations Managers, SOC 11-1021.00: O*NET OnLine, sponsored by the U.S. Department of Labor.
18. Advanced Manufacturing in Texas: Office of the Texas Governor, Economic Development and Tourism.

Manufacturing USA Program Strategic Plan

December 2025



NIST AMS 600-18

This publication is available free of charge from:
https://doi.org/10.6028/NIST.AMS.600-18.

About This Document

This *2025 Manufacturing USA Program Strategic Plan* outlines the role of the Manufacturing USA institutes and participating federal agencies in enhancing American manufacturing competitiveness by advancing manufacturing technologies, fostering agile domestic supply chains, and developing a skilled advanced manufacturing workforce. This document fulfills the strategic planning requirement under the Program's authorizing statute.*

Disclaimer

Any mention of companies or commercial products within this document is for information only and does not imply recommendation or endorsement by the National Institute of Standards and Technology (NIST) or the other federal agencies participating in Manufacturing USA.

Permissions

All tables, figures, and photos in this report, unless otherwise noted, were produced by participants in the Advanced Manufacturing National Program Office's Interagency Working Team.

Any permissions required for third-party materials provided by institutes for this document are the responsibility of the reporting institutes.

Copyright

This document is a work of the U.S. Government and is not subject to copyright in the United States (see 17 U.S.C. § 105). Foreign rights are reserved.

Cover Photo Credits: BioMADE ©Sylvie Lam, RAPID, CESMII and Oak Ridge National Labs, RFTI, IACMI

* Consolidated and Further Continuing Appropriations Act, 2015, (Pub. L. 113-235, Title VII – Revitalize American Manufacturing Innovation Act of 2014, codified at 15 U.S.C. § 278s(i)(2)(C)). See: http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

Table of Contents

Overview of the Manufacturing USA Program **1**

Manufacturing USA Program Strategy **8**

Vision 8

Mission 8

Goals and Objectives 8

Goal 1: Increase the competitiveness of U.S. manufacturing 10

Goal 2: Transition innovative technologies into scalable domestic manufacturing capabilities 11

Goal 3: Develop an advanced manufacturing workforce 13

Goal 4: Promote a durable network of institutes serving national priorities 16

Path Forward **18**

Appendix A: Coordinating and Reporting **19**

Appendix B: Program Assessments **22**

Appendix C: Abbreviations **24**

Overview of the Manufacturing USA Program

The Manufacturing USA Program catalyzes public and private investments in pre-competitive advanced manufacturing technology. It develops new technologies for transition to American manufacturing, while preparing and connecting the workforce for advanced manufacturing jobs. These investments improve the capability, resilience, and security of the domestic industrial base and manufacturing supply chains, unleashing U.S. global competitiveness.

Advanced manufacturing encompasses new ways to produce existing products as well as the creation of entirely new products driven by advanced and emerging technologies. These activities may rely on the integration and coordination of information, automation, computation, software, sensing, and networking. They may also utilize cutting-edge materials and emerging capabilities stemming from advancements in the physical and biological sciences, such as materials science, chemistry, and biology.

The Manufacturing USA Program's authorizing legislation[1] directed the Secretary of Commerce to establish the Manufacturing USA Program and convene a network of institutes focused on advanced manufacturing innovation. The mission of the Manufacturing USA Program is to connect people, ideas, and technology to solve industry-relevant advanced manufacturing challenges, thereby enhancing industrial competitiveness. By achieving this mission, the Program strengthens the economy, expands opportunities for high-paying jobs, improves national security, and advances healthcare solutions.

The Manufacturing USA Program accomplishes its mission through robust interagency cooperation and a network of uniquely structured public-private partnerships. Federal agencies and Manufacturing USA institutes work together to advance the Program's mission through the Manufacturing USA network, which is coordinated by the Advanced Manufacturing National Program Office.

1 Revitalize American Manufacturing and Innovation Act of 2014 (Pub. L. 113-235, codified in relevant parts at 15 U.S.C. § 278s(b) and 15 U.S.C. § 278s(c)). http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

Participating Federal Agencies

Eighteen Manufacturing USA institutes have been established to date by the Department of Commerce (DOC), the Department of Defense (DoD), and the Department of Energy (DOE). In addition to these three sponsoring agencies, six other federal agencies participate in the Manufacturing USA Program: Department of Education (ED), Department of Labor (DOL), Health and Human Services (HHS), National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), and Department of Agriculture (USDA).

Together, the interagency team shares information and approaches to address mission-specific manufacturing challenges and identify opportunities to collaborate to strengthen the national impact of the Program.

Figure 1. Agencies participating in Manufacturing USA.



The Advanced Manufacturing National Program Office

The Manufacturing USA Program's authorizing legislation also directed DOC to establish an office at the National Institute of Standards and Technology (NIST) to oversee the planning, management, and coordination of the Program.[2] The Advanced Manufacturing National Program Office (AMNPO) serves as this interagency program office, convening and coordinating the Program's activities in collaboration with federal agencies whose missions contribute to or benefit from advances in the nation's manufacturing capabilities.

The Manufacturing USA Institutes

Each Manufacturing USA institute is a public-private partnership of companies, academia, state, Tribal, and local governments, and federal agencies that co-invest in developing innovative advanced manufacturing technologies and capabilities. Each institute focuses on a unique technology area and provides the resources and infrastructure needed for the collaborative, pre-competitive development of promising innovations to serve the nation's industrial base. Institutes also work to ensure the workforce has the skills needed to support the industrial deployment of these technologies.

The Manufacturing USA institutes, working with the participating agencies, address important manufacturing challenges for critical and emerging industries. DOC, DoD, and DOE have provided initial funding for institutes through competitive federal assistance agreement awards. Institutes established under the Manufacturing USA statute have a co-investment requirement, with a minimum of 1:1 match of non-federal resources to federal base program support.[3] Federal support may be continued after an initial funding period of 5-7 years following a rigorous evaluation.

2 Revitalize American Manufacturing and Innovation Act of 2014 (Pub. L. 113-235, codified in relevant part at 15 U.S.C. § 278s(i)(2)(A)). http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

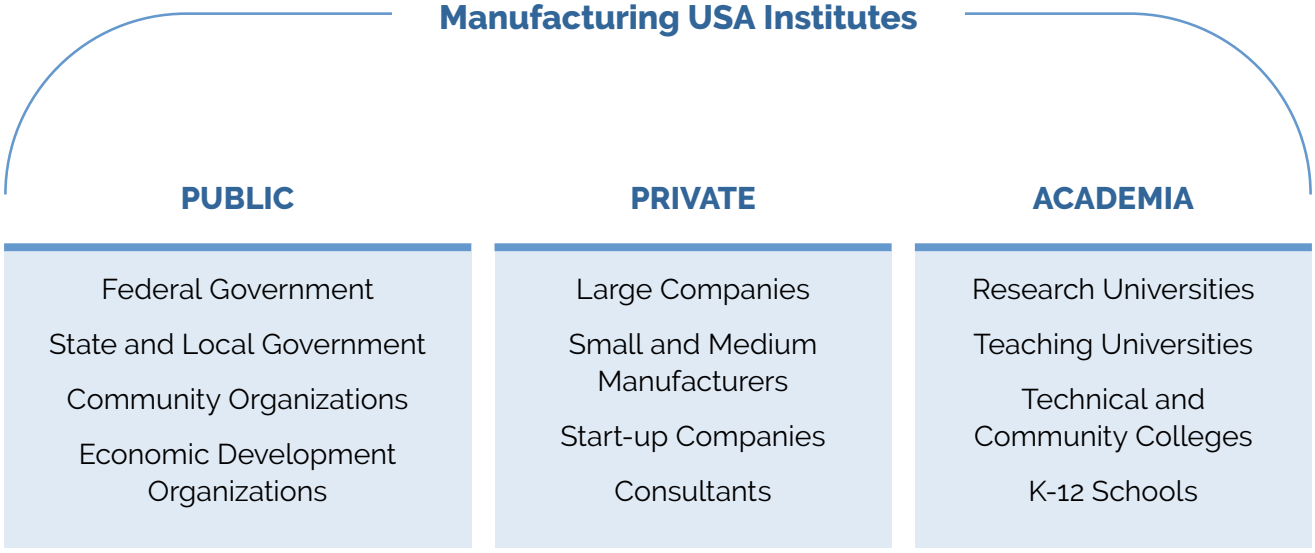
3 Revitalize American Manufacturing and Innovation Act of 2014 (Pub. L. 113-235, codified in relevant part at 15 U.S.C. § 278s(e)(7)). http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim)

Institute technology focus areas reflect the mission and needs of the sponsoring federal agencies:

- The Department of Commerce established two institutes focused on manufacturing technology and workforce development in industry sectors of critical importance to the U.S. economy, with significant associated impacts on national security.
- The Department of Defense established nine institutes, focused on advancing manufacturing technologies needed for the military and potential dual-use commercial applications.
- The Department of Energy established seven institutes, focused on improving the productivity, affordability, competitiveness, and resource efficiency of manufacturers across industrial sectors.

All institutes tailor operational plans to their technology focus, membership, and the sponsoring agency's mission. As depicted in Figure 2 below, each institute convenes members from manufacturing enterprises of all sizes, universities, community colleges, state, Tribal, and local governments, and other federal equities with interests and capabilities in the specified technology area. Members leverage the institutes' unique technical and networking capabilities to collectively accelerate advanced manufacturing innovation while protecting each member's intellectual property. They also upskill the workforce needed to advance new technologies into industrial use. Institute-led technology-focused networks also serve as invaluable resources for the federal government to tackle agency-specific advanced manufacturing challenges.

Figure 2. Manufacturing USA Institute Members and Stakeholders.



The Manufacturing USA Network

The Manufacturing USA Program's network of institutes serves as a national asset to drive impact across the private, public, and academic sectors. Through the cooperation, collaboration, and leadership of the institutes, working with their federal sponsors and other participating agencies, the Manufacturing USA network unites domestic advanced manufacturing stakeholders into a nationwide, collaborative innovation ecosystem advancing the capabilities of the dual-use industrial base.

In Fiscal Year 2023, the Manufacturing USA institutes collectively worked with over 2,900 member organizations to collaborate on more than 900 technology and workforce-applied R&D projects. More than 62% of member organizations are manufacturers, and 73% of those are small and medium-sized manufacturers, reflecting the composition of the U.S. industrial base. The institutes also engaged more than 150,000 students, teachers, and workers in advanced manufacturing skills training. State, industry, and non-core federal funds contributed about $380 million to these activities, representing a 2.4:1 investment match to the core federal funds.

The network of institutes benefits from years of sharing best practices and coordinating activities, advancing the Program's vision for U.S. global leadership in advanced manufacturing. At the same time, each institute continues to fulfill the mission needs of its sponsoring agency.

Table 1. Manufacturing USA Institutes (April 2025)

Institute	Technology Focus Area	Agency	Headquarter Location	Est.
America Makes The National Additive Manufacturing Innovation Institute	Additive and adaptive manufacturing	DoD	Youngstown, OH	Aug 2012
MxD Manufacturing Times Digital	Digital manufacturing and design / Cybersecurity in Manufacturing	DoD	Chicago, IL	Feb 2014
LIFT Lightweight Innovations For Tomorrow	Lightweight materials manufacturing	DoD	Detroit, MI	Feb 2014
PowerAmerica Next Generation Power Electronics Manufacturing Innovation Institute	Wide-bandgap power electronics manufacturing	DOE	Raleigh, NC	Dec 2014
IACMI Institute for Advanced Composites Manufacturing Innovation	Fiber-reinforced polymer composites manufacturing	DOE	Knoxville, TN	Jun 2015
AIM Photonics American Institute for Manufacturing Integrated Photonics	Integrated photonics manufacturing and packaging	DoD	Rochester & Albany, NY	Jul 2015
NextFlex America's Flexible Hybrid Electronics Manufacturing Institute	Hybrid electronics and sensors manufacturing	DoD	San Jose, CA	Aug 2015
RFTI Revolutionary Fibers and Textiles Institute	Revolutionary fabric and textile manufacturing and soft good process automation	DoD	Cambridge, MA	Apr 2016
CESMII Collaborative Ecosystems for Smart Manufacturing Innovation Institute	Smart manufacturing, sensing, control, modeling, analytics and platform technologies	DOE	Los Angeles, CA	Dec 2016
ARMI | BioFab USA Advanced Regenerative Manufacturing Institute	Engineered tissues and tissue-related manufacturing	DoD	Manchester, NH	Dec 2016
ARM Institute Advanced Robotics for Manufacturing Institute	Transformative artificial intelligence and robotic technologies for manufacturing	DoD	Pittsburgh, PA	Jan 2017

Table 1. Manufacturing USA Institutes (April 2025) *continued*

Institute	Technology Focus Area	Agency	Headquarter Location	Est.
NIIMBL National Institute for Innovation in Manufacturing Biopharmaceuticals	Biopharmaceutical manufacturing	DOC	Newark, DE	Mar 2017
RAPID Rapid Advancement in Process Intensification Deployment Institute	Modular chemical-process intensification for manufacturing	DOE	New York, NY	Mar 2017
REMADE Reducing EMbodied-energy And Decreasing Emissions	Material-efficient technologies	DOE	Rochester, NY	May 2017
CyManII Cybersecurity Manufacturing Innovation Institute	Cybersecure and energy-efficient manufacturing	DOE	San Antonio, TX	Sep 2020
BioMADE Bioindustrial Manufacturing and Design Ecosystem	Reliable bio-industrial manufacturing technologies	DoD	St. Paul, MN	Oct 2020
EPIXC Electrified Processes for Industrial eXCellence	Hybrid industrial heating	DOE	Tempe, AZ	May 2023
SMART USA Semiconductor Manufacturing and Advanced Research with Twins	Digital Twins for Semiconductor Manufacturing	DOC	Raleigh, NC	Jan 2025

Manufacturing USA Program Strategy

The 2025 Manufacturing USA Strategic Plan guides the participating agencies and institutes to achieve the Program's vision, mission, goals, and objectives, unleashing American innovation and creating lasting value in critical manufacturing industries.

Vision

The vision for the Manufacturing USA Program is ***U.S. global leadership in advanced manufacturing.***

Mission

To support this vision, the mission of the Manufacturing USA Program is to connect people, ideas, and technology to solve industry-relevant advanced manufacturing challenges and enhance industrial competitiveness.

Goals and Objectives

In alignment with the vision and mission of the Manufacturing USA Program, the participating agencies and institutes work toward four consensus goals that flow from the nine statutory purposes stated in the authorizing legislation[4] and are consistent with each sponsoring agency's mission:



Goal 1: Increase the competitiveness of U.S. manufacturing



Goal 2: Transition innovative technologies into scalable domestic manufacturing capabilities



Goal 3: Develop an advanced manufacturing workforce



Goal 4: Promote a durable network of institutes serving national priorities

These four goals guide a clear strategy for driving manufacturing innovation, speeding the shift from early-stage research to development and, ultimately, deployment in the U.S. manufacturing sector. An interagency team assessed the Program's goals and objectives from previous Strategic Plans[5] to shape this 2025 plan.

4 15 U.S.C. § 278s(b)(2). https://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

5 *National Network for Manufacturing Innovation (NNMI) Program Strategic Plan*, Executive Office of the President, National Science and Technology Council, Advanced Manufacturing National Program Office (February 2016). https://www.manufacturingusa.com/reports/national-network-manufacturing-innovation-nnmi-program-strategic-plan,

and *Manufacturing USA Strategic Plan*, Advanced Manufacturing National Program Office (November 2019). https://www.manufacturingusa.com/reports/manufacturing-usa-strategic-plan.

Strategic Plan for the Manufacturing USA Program, Advanced Manufacturing National Program Office (August 2024). https://www.manufacturingusa.com/news/manufacturing-usa-releases-2024-strategic-plan.

Strategic objectives were refined to emphasize the importance of leadership, technical innovation, workforce development, and strong private-sector partnerships in advancing the Program's mission. The Program's goals and objectives are outlined in detail in the sections below and summarized in Table 2.

Table 2. Manufacturing USA Strategic Goals and Objectives



Goal 1: Increase the competitiveness of U.S. manufacturing

Objective 1.1 Promote innovation networks to strengthen the manufacturing industrial base.	**Objective 1.2** Establish and support a portfolio of industry-relevant innovative technologies.	**Objective 1.3** Provide U.S. leadership to serve national advanced manufacturing priorities.



Goal 2: Transition innovative technologies into scalable domestic manufacturing capabilities

Objective 2.1 Provide validated innovative technologies, materials, and equipment.	**Objective 2.2** Promote shared learning across manufacturing sectors.	**Objective 2.3** Facilitate collaborations for multidisciplinary technologies and supply chain development



Goal 3: Develop an advanced manufacturing workforce

Objective 3.1 Encourage the future workforce to pursue advanced manufacturing careers.	**Objective 3.2** Promote work-based learning, Registered Apprenticeships, and hybrid learning.	**Objective 3.3** Develop and integrate industry-driven advanced manufacturing credentialing and certification.



Goal 4: Promote a durable network of institutes serving national priorities

Objective 4.1 Implement membership structures that promote shared risks and investment.	**Objective 4.2** Adopt institute models that ensure long-term continuity of operations.	**Objective 4.3** Address the needs of emerging manufacturing sectors and supply chains.

Goal 1: Increase the competitiveness of U.S. manufacturing

The deployment of advanced manufacturing innovation that boosts production capabilities and introduces new products to the marketplace strengthens U.S. manufacturers' competitiveness. The three strategic objectives that support Goal 1 position the Program to build the linked innovation networks, technical portfolios, and leadership needed to accelerate innovation collaboratively.

Objective 1.1 Promote innovation networks to strengthen the manufacturing industrial base. Strengthening market-driven manufacturing innovation and enhancing domestic production is critical for U.S. global competitiveness. Manufacturing USA institutes provide regional and national advanced manufacturing leadership, leveraging expertise in specific technology areas and industries. Institutes partner with industry, universities and government laboratories to reduce risks associated with technology development and accelerate deployment to American manufacturers. By combining the resources and market knowledge of larger partners with the agility of smaller partners, institutes create opportunities across U.S. manufacturing value chains. As described in Goal 3, institute partnerships with community colleges, universities, non-profits organizations, and workforce development programs are critical contributors in innovation networks for U.S. advanced manufacturing. These partners provide curricula and training materials to grow the pipeline of skilled workers.

Objective 1.2 Establish and support a portfolio of industry-relevant innovative technologies. The Manufacturing USA Program grows domestic advanced manufacturing capabilities through de-risking innovative technologies and preparing them for implementation in commercial production. These investment priorities are driven by manufacturing roadmaps that combine industry knowledge of market demands and end user requirements in alignment with agency mission needs, resulting in a competitive advantage for the institute's members.

The institutes identify promising low Technology Readiness Level (TRL) or Manufacturing Readiness Level (MRL) manufacturing technologies and conduct collaborative applied research projects, including translational research, to mature for scale-up and transfer into industrial development and use.[6]

6 TRLs are used to estimate the maturity of technologies, especially for acquisition purposes. MRLs are criteria used to assess the readiness of a product or system for full-scale production. Each readiness scale can be useful for assessing the development level of a new manufacturing technology, depending on the specific technology and application.

Institutes also provide leadership within technology or sector-focused manufacturing communities by connecting small start-up technology developers to end users, leading to earlier and better knowledge of user requirements to inform laboratory prototypes.

Objective 1.3 Provide U.S. leadership to serve national advanced manufacturing priorities. Manufacturing USA Institutes serve both as sector leaders to determine priorities for implementing advanced manufacturing innovations and as national leaders with expert insight into the nation's domestic competitiveness needs. Collaboration among institutes and the federal government, with input from all stakeholders results in more actionable strategies to advance the manufacturing capabilities within sectors important to the dual-use U.S. industrial base. By sponsoring and convening activities such as technical roadmapping, technology forums, and workforce training, the Manufacturing USA network facilitates consensus on the shared needs of industrial ecosystems to drive innovation beyond an individual institute's reach. Through strong leadership and coordination of investments, the network can work together to support current and future industries.



Goal 2: Transition innovative technologies into scalable domestic manufacturing capabilities

Advanced manufacturing technologies that show promise in research laboratories often face technical and economic barriers that limit scale-up and implementation in production environments. Advancement of promising manufacturing innovations developed in universities and small- and medium-sized manufacturers (SMMs) often stalls prior to scale-up, which is detrimental to aggregate U.S. manufacturing productivity. Manufacturing USA lowers barriers by making complex technologies more accessible to manufacturing companies at all scales, reducing market failures.

The scale-up amplification of newly developed manufacturing capabilities is a key benefit stemming from a connected network of institutes. The collective networks within Manufacturing USA also inform the development of strategies to address facility and equipment access needs and linkage to later-stage business services to support the scale-up of technologies in development.

Objective 2.1 Provide validated innovative technologies, materials, and equipment. Many manufacturers, particularly SMMs, cannot independently take on the technical and financial risks associated with the development, transition, and adoption of new manufacturing technologies. Manufacturing USA institutes help resolve this challenge by identifying promising breakthroughs that align with compelling industry needs and then advancing those technologies to the point of broad accessibility through translational research.

Projects sponsored by the institutes engage technology developers across member institutions and regions to conduct applied research and development (R&D) to address shared innovation priorities. Institutes develop testbeds and demonstration facilities that provide opportunities for potential users to assess the suitability of new technologies for their needs, in addition to industrially relevant context for innovators seeking to advance the state of the art.

These facilities and services, including affordable state-of-the-art prototyping capabilities, allow domestic manufacturers to conduct limited-scale production runs to evaluate new manufacturing processes or prototypes prior to committing to full-scale production.[7] Manufacturing USA institutes also provide access to technical consulting services, equipment, training, and opportunities to collaborate and conduct business with other institute members and technology and service providers, lowering the barriers and timeline to industrial deployment.

Objective 2.2 Promote shared learning across manufacturing sectors. The Manufacturing USA Program promotes partnerships that include large, small and medium-sized organizations that benefit from shared resources and understanding of priorities and end-user requirements for innovative technologies. Innovation in one sector is often cross-cutting and faces similar barriers to adoption in other manufacturing sectors. The Program provides a unique platform for sharing knowledge and experience among institute members, the broader manufacturing sectors they serve, and across federal agencies and federal laboratories to accelerate the maturation of innovation into industrial use.

The institutes create nationwide value by communicating emerging government and industry technology priorities, spotlighting institute-led activities, products, and services, and addressing shared technical challenges. Shared learning topics include return on investment in infrastructure, best practices for secure data sharing, managing

7 Manufacturing USA institutes have historically focused applied, precompetitive R&D on bridging the "valley of death" in TRLs or MRLs 4-7. As chartered, institutes can, and do to the extent supported by funding, work with later technology maturity levels (i.e., TRLs 7-9 or MRLs 7-10) to support scale-up activities such as technology qualification, pilot production, manufacturing deployment, and commercialization.

engagement with foreign-owned entities, implementing cyber-physical security practices, and creating effective incentives for pre-competitive technology collaboration. While each institute serves the unique needs of its community, the partnerships address common challenges that drive growth of a stronger industrial base.

Objective 2.3 Facilitate collaborations for multidisciplinary technologies and supply chain development. Each institute specializes in a unique subset of manufacturing technologies, ranging from biopharmaceuticals to robotics to cybersecurity, each with its own supply chain networks. However, product development often requires the application and integration of multiple technologies and can benefit from collaboration between the institutes. Cross-institute collaborations may stimulate regional innovation networks in industry sectors that are geographically concentrated. Furthermore, cross-collaboration promotes the development of new domestic supply chain networks, technical tools, and services, thereby enhancing economic and national security.

Manufacturing USA institutes are non-federal entities with complex membership structures where value is created by balancing the needs and interests of partners, including federal sponsors. The requirement for non-federal co-investment to match Federal base funding inserts an additional layer of complexity that must be managed when navigating cross-network collaboration. Despite those strategic and operational realities, the cultivation of partnerships across the network is an opportunity to tap into the full capabilities of the network to accelerate technical innovation and develop the skilled workforce needed for national security, energy security, and U.S. industrial competitiveness.



Goal 3: Develop an advanced manufacturing workforce

The Manufacturing USA Program has a unique role in accelerating the development of a U.S. advanced manufacturing workforce that includes skilled technicians, production workers, engineers, scientists, and laboratory personnel.

U.S.-based innovation can create secure high-wage manufacturing jobs, many of which do not require a four-year postsecondary degree. However, the gap between the skills needed for the new technologies and the skills possessed by the U.S. manufacturing workforce is wide and growing. This gap will widen further unless workforce development keeps pace with the changing skills needed for jobs that emerge with the development

and deployment of new technologies. Aligned with *America's Talent Strategy,*[8] the Manufacturing USA Program supports a workforce system that can propel American workers into high-wage careers and deliver the talent advanced manufacturing employers need to power the nation's economic resurgence.

While each institute has its own technology portfolio, all institutes share a goal of fueling advanced manufacturing job creation, strengthening career technical education pathways, leveraging innovative learning tools, upskilling incumbent workers, and increasing supply-side responsiveness to emerging workforce demand.

Objective 3.1 Encourage the future workforce to pursue advanced manufacturing careers. The U.S. will only succeed in building workforce capacity when there is a more positive narrative around manufacturing careers and when the talent pools from which employers draw are broader. Negative perceptions surrounding the manufacturing workplace are well documented and are a barrier to those considering manufacturing career pathways. Nurturing the interest of students in science, technology, engineering, and mathematics (STEM) in advanced manufacturing is an important step toward developing an advanced manufacturing workforce to meet current and future U.S. needs.

Manufacturing USA institutes work with educational institutions to promote manufacturing careers. These partners support the dissemination of career opportunities available through STEM education, including building STEM knowledge with internships, pre-apprenticeship and Registered Apprenticeship programs, afterschool programming, and other approaches outside of typical classroom settings. By highlighting the types of high-paying jobs in manufacturing and the opportunities for career advancement in this sector, these partners play a critical role in attracting new talent.

Communication plans for network and institute activities should include expanded outreach efforts and drive access to knowledge about advanced manufacturing careers to grow interest in advanced manufacturing careers. For example, information on advanced manufacturing opportunities in the defense industrial base should be readily available to veterans and service members that are transitioning to civilian careers.

Objective 3.2 Promote work-based learning, Registered Apprenticeships, and hybrid learning. Institutes support education and workforce development at all levels and provide guidance on the skills and knowledge needed to meet the needs of specific advanced manufacturing occupations. Connecting students to work-based

8 https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/2025/08/Americas-Talent-Strategy-Building-the-Workforce-for-the-Golden-Age.pdf.

learning opportunities such as Registered Apprenticeships, cooperative education (Co-op), internships, and residency-type capstone projects is necessary to integrate the conceptual and hands-on learning needed for success.

To ensure students have access to high-quality learning experiences, institutes encourage robust industry and employer participation in the development of Registered Apprenticeships and other work-based learning opportunities. Such programs must also be aligned to facilitate students' seamless transitions through levels of study. The institutes are increasingly monitoring and addressing the quality and alignment of secondary and postsecondary career and technical education programs to ensure that technician education programs are built and scaled around realistic expectations of the needs of industry.

Manufacturing USA expands Registered Apprenticeships into new sectors, which is consistent with Executive Order 14278, *"Preparing Americans for High-Paying Skilled Trade Jobs of the Future,"*[9] which establishes a policy to "protect and strengthen Registered Apprenticeships and build on their successes to seize new opportunities and unlock the limitless potential of the American worker." Focusing on promoting alternatives to traditional college degrees, it connects workers with education and training for high-skill, high-paying trades in advanced manufacturing.

Objective 3.3 Develop and integrate industry-driven advanced manufacturing credentialing and certification. To create a set of credentials that accurately represent the workforce needs and can evolve as innovation is deployed, Manufacturing USA institutes work with industry to translate emerging advanced technologies into occupational requirements. The institutes also work with education and training providers to guide the development of high-quality curricula, learning materials, and industry-relevant credentials. Aligning industry workforce needs with education and training programs will support the changing skill sets and competencies that are essential in a globally competitive advanced manufacturing workforce. Additionally, implementing stackable credentials enables workers to advance in their careers while providing employers with a mechanism to upskill entry-level and incumbent workers.

Consistent with the pillars of *America's Talent Strategy*,[10] the Institutes collaborate with industrial partners and national organizations, including professional organizations and trade groups, to support the development and validation of worker credentials, including for occupations for which certifications and degrees are not already available.

9 https://www.whitehouse.gov/presidential-actions/2025/04/preparing-americans-for-high-paying-skilled-trade-jobs-of-the-future/.

10 https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/2025/08/Americas-Talent-Strategy-Building-the-Workforce-for-the-Golden-Age.pdf.

Goal 4: Promote a durable network of institutes serving national priorities

The Manufacturing USA Program cultivates and maintains engagement from stakeholders across the advanced manufacturing value chain. It is critical that institutes develop business models that support long-term viability by delivering tangible benefits to partners and successfully driving co-investment from the private sector. Sufficient support from industrial and academic institute members, government partners, and other sources is the foundation of operational viability. Sponsoring federal agencies and the institutes evaluate performance through metrics developed both at the institute and program levels to monitor both risks and value delivered.

Objective 4.1 Implement membership structures that promote shared risks and investment. Manufacturing USA offers value to members across stakeholder groups with different core missions, financial resources, business operations, and expectations. The Program creates an opportunity for domestic stakeholders to pool their risk, supported in part by the federal government, to advance manufacturing so the next generation of products and systems continues to be made in the U.S. Although culture and needs may differ among industry sectors, the Program benefits from sharing knowledge of successful operational and collaborative partnership models.

Institutes continually identify and recruit key stakeholders across the industry, including suppliers, end-users, and promising start-up companies, and build and maintain strong representation among all member groups to properly inform priorities. They also engage academic institutions, from major research organizations to local community colleges, likely to benefit from and contribute to technical and workforce development activities. Relationships with federal, state, Tribal, and local governments, federal laboratories, professional associations, economic development organizations, and venture capitalists must also be considered in setting membership structures. Knowledge sharing around managing intellectual property and conflicts of interest, effective communication and outreach, and other practices allow institutes to promote shared risk and benefits of membership.

Objective 4.2 Adopt institute models that ensure long-term continuity of operations. Manufacturing USA is a public-private partnership, where federal funding catalyzes co-investment from non-federal partners. To ensure that institutes can continue operations in the event of a lapse in federal funding and to promote business continuity, each institute works with its lead funding agency on long-term planning to include business plans, funding opportunities, and strategic membership models.

The Program supports institute operational continuity in many ways, such as increasing awareness of strategic partners associated with manufacturing and sharing best practices for operationalizing business models. Additional efforts include increasing the awareness of the Manufacturing USA brand and impact via ManufacturingUSA.com, national awareness campaigns, and Congressional briefings. Links to other sources of funding are also promoted through the network of participating agencies and their relationships with non-profit foundations and professional organizations with significant stakeholder reach.

All institutes work with their sponsoring agencies to develop long-term strategic partnership plans, although any given institute may have a plan with distinct features that meet its unique mission, technology, and membership structure. The AMNPO assists institutes and agencies in this process by facilitating the sharing of best practices from earlier institute planning efforts and may share funding opportunities from non-sponsoring agencies with the network.

Objective 4.3 Address the needs of emerging manufacturing sectors and supply chains. The specific manufacturing sectors represented by the existing network of institutes cover many national priorities that are critical to our national security, energy security, and economic prosperity. Determining which existing and emerging advanced manufacturing sectors can benefit from the Manufacturing USA institute model is a strategic decision that must also factor in the potential complementarity or undesired duplication with existing institutes, as well as the needs of sponsoring agencies and national priorities. The full network of federal agencies and Manufacturing USA institutes can contribute valuable perspective to inform future investments to address emerging manufacturing challenges and domestic supply chain networks.

Path Forward

The strength of the Manufacturing USA Program is driven by the work of the institutes and the Program's network of public-private partnerships. The implementation of the strategies presented in this document is the work of the federal agencies and institutes as collaborative partners. Using collaboration mechanisms such as the Program's Federal Interagency Working Team, the Manufacturing USA Council, the annual network meeting, and the Workforce and Communications Teams, the Manufacturing USA partners will work together to identify specific actions to implement this strategy. Any new initiatives, as well as all federal activities documented in this strategic plan, are subject to budgetary constraints and other approvals, including the weighing of priorities and available resources by the Administration in formulating its annual budget and by Congress in legislating appropriations.

Metrics and Evaluation

The Program's Annual Reports to Congress (Appendix A) include a minimum of ten quantitative performance metrics, complemented by an additional twenty-seven education and workforce metrics, that track the progress toward the Program's goals in alignment with the Program's statutory purposes.[11] In addition to these network-wide metrics, each lead sponsoring agency collects and evaluates additional metrics at the institute level relating to the agency's unique mission requirements. As the implementation plan is developed for the strategic objectives outlined in this document, appropriate key indicators for monitoring progress will be identified, building on the performance data collected at the institute and network level.

11 Revitalize American Manufacturing and Innovation Act of 2014 (Pub. L. 113-235, codified in relevant part at 15 U.S.C. § 278s(b)(2)). http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

Appendix A: Coordinating and Reporting

Active coordination has improved the Manufacturing USA Program and increased its impact. Coordination occurs among all the participating federal agencies, among the agencies sponsoring institutes, between the federal agencies and the institutes, and among the institutes themselves.

The Interagency Working Team

The Interagency Working Team is comprised of representatives from participating federal agencies who meet regularly to discuss and coordinate activities. The interagency team also discusses higher-level policy issues and actions that might affect the Manufacturing USA network.

Sponsoring Agency Leadership Meetings

Leaders from the federal sponsoring agencies (DoD, DOE, and DOC), meet biweekly to coordinate activities across the institutes, disseminate and discuss plans for the Manufacturing USA network, and share best practices. This group also establishes *ad hoc* working groups, as needed, with targeted objectives, such as how institutes can be leveraged to address a specific national need.

Education and Workforce Development Team

The Manufacturing USA Education and Workforce Development Team facilitates collaboration among the institutes' workforce development leads and agency partners across the network. The group encourages cross-network projects and shares best practices to expand knowledge and awareness, develop new competency and skill curricula, engage academia, industry, and economic development stakeholders regionally and nationally, and scale and implement education and workforce development activities to maximize impact.

Communications Team

Each institute has its own strategies and communication channels to promote the institute's work and benefits of membership within its technical community, and to engage with current and potential members. Institute communication leads share information and ideas for effective outreach and communications with a variety of audiences. In addition, the institute and sponsoring agencies work closely to plan and implement targeted public activities, such as national outreach initiatives. The team also leverages shared resources and approaches to improve awareness and perceptions of advanced manufacturing careers.

The Advanced Manufacturing National Program Office (AMNPO) communicates to various stakeholders through multiple media and non-traditional channels to broaden awareness of Manufacturing USA and opportunities to engage. These communications primarily focus on the U.S. manufacturing industry, including manufacturers of all sizes who benefit from technology and workforce development. Communication efforts also reach workers, educators, and students who benefit from education and workforce development opportunities. A national educational awareness campaign involves network-wide collaboration to craft and share stories that illustrate the impacts that institutes and their members have across key areas, including advanced manufacturing technology leadership, strategic supply chain development, pandemic response, and advanced manufacturing education and workforce development. These efforts also resulted in the Emmy®-awarded short documentary, *Rethinking Manufacturing.*[12]

Through the ManufacturingUSA.com website and social media (LinkedIn and Twitter), the AMNPO engages the national ecosystem, promotes the role of the network of institutes, shares news and successes from the institutes, informs potential new members about how to participate in institute activities, and updates the manufacturing industry on the opportunities available through the Manufacturing USA Program. These collective communication efforts complement the activities of the institutes and agencies within the network.

Network Meetings

The AMNPO arranges for annual Network meetings. Staff from Manufacturing USA institutes and participating agencies connect at least once a year at these meetings to share best practices, generate new ideas for collaboration, and identify cross-institute priorities. Annual meetings often include pre-meeting and parallel working sessions for specific interest groups, such as an executive session for institute directors, senior federal leaders, the Education and Workforce Development team, and the Communication team. These meetings have proven to be productive for information sharing and idea generation, as well as facilitating dialogue on Program direction.

12 *Brunner, Garcia, Gerskovic and Stewart Receive Emmy® Awards for Video, "Rethinking Manufacturing"* National Institute of Standards and Technology, Department of Commerce (August 14, 2020). https://www.nist.gov/about-us/nist-awards/brunner-garcia-gerskovic-and-stewart-receive-emmyr-awards-video-rethinking.

Institute Coordination

Institutes identify shared best practices by comparing membership models, industry sectors, and target stakeholders. By leveraging lessons from more established institutes, new institutes can scale up and mature more quickly. Participating agencies can expand engagement with institutes by identifying unique delivery opportunities. Encouraging this internal communication will continue both in regular, formal interactions discussed below and in informal or *ad hoc* situations.

In 2022, the Program's authorizing legislation was amended to direct NIST to establish a Council of Institute directors to foster collaboration among the Institutes and to assist AMNPO in carrying out its functions.[13] In fulfilling this mandate, AMNPO first convened the Manufacturing USA Council in 2023. The Council selects cross-institute collaborations to extend the impacts of the network.

Annual Reports to Congress

Manufacturing USA is mandated to provide Annual Reports to Congress. The Program has exceeded this requirement by also producing annual highlight reports detailing success stories from every institute in technology advancement projects and workforce development, and the building of innovation ecosystems and supply chains. All reports are available on www.ManufacturingUSA.com.

13 15 U.S.C. § 278s(i)(7). http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

Appendix B: Program Assessments

Sponsoring Agency Assessments

In addition to external assessments and annual performance metrics, sponsoring agencies implement assessment processes associated with renewing assistance agreements.

In 2019, agencies sponsoring institutes under the Manufacturing USA authority were given authorization to renew funding for sponsored institutes beyond their initial award period, subject to a rigorous merit review.[14] Following this authorization, DOC and DOE each established their review process and evaluation criteria. In 2021, NIST developed its own performance standards to evaluate the renewal of DOC-sponsored Manufacturing USA institutes using a rigorous merit review process by an independent, external evaluation panel.[15] The process and standards were piloted with the DOC-sponsored institute NIIMBL, leading to a renewal in their funding.

In a 2019 Congressionally Requested plan for sustained investment in its institutes, DoD determined that continued investment would be contingent upon periodic evaluation of performance and progress towards charting principles. Using evaluation criteria based upon established peer review of federally funded R&D centers, DOD has a five-year rotating schedule of assessments, evaluating two institutes each year. The DoD-chartered Joint Defense Manufacturing Council conducts these assessments. Similarly, DOE published a Manufacturing USA Institute Renewal Process Framework in 2022.[16] The framework outlines the steps DOE will take to consider award renewals for its institutes and establishes the criteria and input sources to be used.

14 Revitalize American Manufacturing and Innovation Act of 2014 (Pub. L. 113-235, codified in relevant part at 15 U.S.C. § 278s(e)(2)(B)(i), as amended). http://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

15 *Manufacturing USA Institute Evaluation: Renewal Process and Performance Standards,* Office of Advanced Manufacturing, National Institute of Standards and Technology (July 15, 2021). https://www.manufacturingusa.com/reports/manufacturing-usa-institute-evaluation-renewal-process-and-performance-standards.

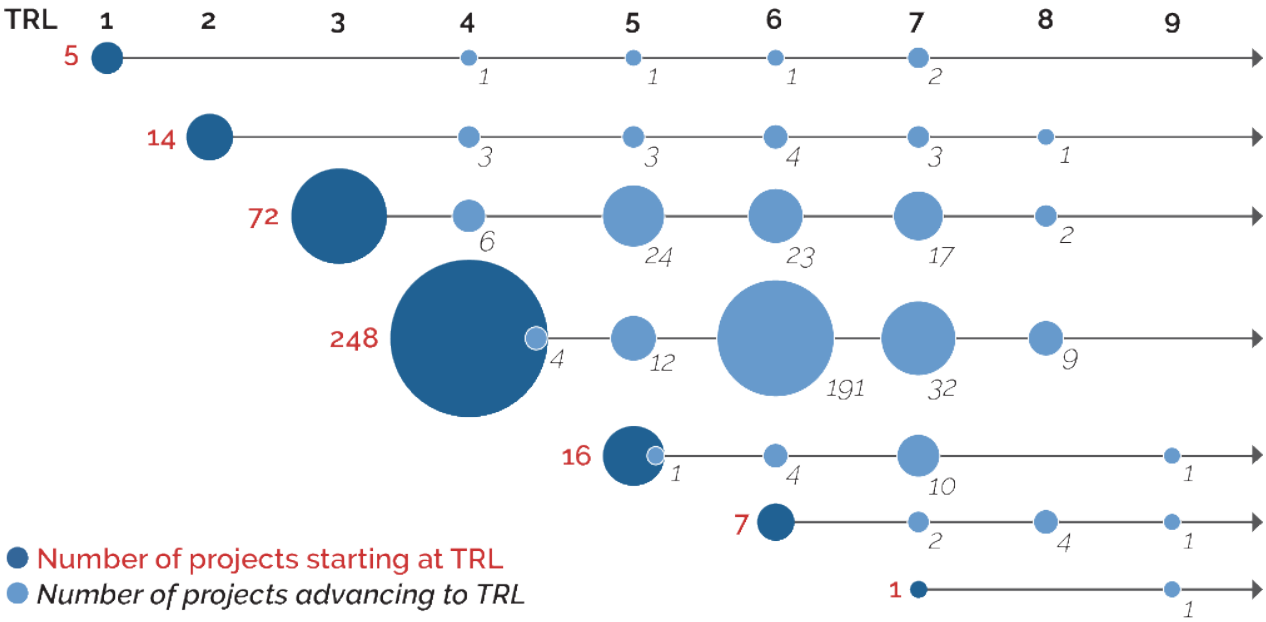
16 *Clean Energy Manufacturing Innovation Institute Renewal Process Framework.* Department of Energy (June 3, 2022). https://www.energy.gov/sites/default/files/2022-06/Clean%20Energy%20Manufacturing%20Institute%20Renewal%20Process%20Framework.pdf.

External Assessments

The Manufacturing USA Program has greatly benefited from external assessments, notably periodic assessments by the Government Accountability Office (GAO) and multiple workshops and studies convened by the National Academies of Sciences, Engineering and Medicine. Feedback on the Program, whether highlighting successes or recommending improvements, has been used to guide the Program's activities and make them more effective. Best practices identified through independent assessments have provided valuable guidance for both new and maturing institutes.

In December 2021, GAO released its third assessment report on Manufacturing USA: *Advanced Manufacturing: Innovation Institutes Report Technology Progress and Members Report Satisfaction with Their Involvement*.[17] GAO found that the majority of institute projects moved from TRL 4 to 6, developing technology from lab demonstration to a prototype system implemented in a simulated production environment. Importantly, the report indicated that small manufacturers, who are institute members, were generally engaged and satisfied with their participation. Finally, the GAO indicated that while sponsoring agencies had implemented prior recommendations on interagency collaboration and the further development of continuity of operations criteria, the further development of network-wide performance metrics was still recommended.

Figure 3. Advancement of Technology Readiness Level (TRL) for Completed Manufacturing USA Institute Projects, as of March 2021.



Source: GAO analysis of data provided by Manufacturing USA institutes. | GAO-22-103979

17 *Advanced Manufacturing: Innovation Institutes Report Technology Progress and Members Report Satisfaction with Their Involvement*, GAO-22-103979 (December 16, 2021). https://www.manufacturingusa.com/reports/advanced-manufacturing-innovation-institutes-report-technology-progress-and-members-report.

Appendix C: Abbreviations

AIM Photonics	American Institute for Manufacturing Integrated Photonics
America Makes	The National Additive Manufacturing Innovation Institute
AMNPO	Advanced Manufacturing National Program Office
ARM	Advanced Robotics for Manufacturing Institute
ARMI | BioFabUSA	Advanced Regenerative Manufacturing Institute
BioMADE	Bioindustrial Manufacturing and Design Ecosystem
CESMII	Collaborative Ecosystems Smart Manufacturing Innovation Institute
CMEI	Office of Critical Minerals and Energy Innovation (formerly DOE's Office of Energy Efficiency & Renewable Energy)
Co-op	Cooperative Education
CyManII	Cybersecurity Manufacturing Innovation Institute
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
ED	Education Department
EDA	Economic Development Administration (DOC)
EPIXC	Electrified Processes for Industrial eXCellence
EWD	Education and Workforce Development
FDA	Food and Drug Administration
FY	Fiscal Year
GAO	Government Accountability Office
HHS	Department of Health and Human Services
IACMI	Institute for Advanced Composites Manufacturing Innovation
IP	Intellectual Property
LIFT	Lightweight Innovations For Tomorrow
MxD	Manufacturing Times Digital

MRL	Manufacturing Readiness Level
PowerAmerica	Next Generation Power Electronics Manufacturing Innovation
NASA	National Aeronautics and Space Administration
NextFlex	America's Flexible Hybrid Electronics Manufacturing Institute
NIIMBL	National Institute for Innovation in Manufacturing Biopharmaceuticals
NIST	National Institute of Standards and Technology (DOC)
NSF	National Science Foundation
OAM	Office of Advanced Manufacturing
RAMI Act	Revitalize American Manufacturing and Innovation Act of 2014
RAPID	Rapid Advancement in Process Intensification Deployment Institute
REMADE	Reducing Embodied Energy and Decreasing Emissions
RFTI	Revolutionary Fibers and Textiles Institute
R&D	Research and Development
SBIR	Small Business Innovation Research
SMM	Small and Medium-Sized Manufacturer
STEM	Science, Technology, Engineering, and Mathematics
TRL	Technology Readiness Level
USDA	Department of Agriculture

Advanced Manufacturing National Program Office

ManufacturingUSA.com

NIST AMS 600-18

This publication is available free of charge from:
https://doi.org/10.6028/NIST.AMS.600-18.

260122



NATIONAL STRATEGY FOR ADVANCED MANUFACTURING

A Report by the

SUBCOMMITTEE ON ADVANCED MANUFACTURING

COMMITTEE ON TECHNOLOGY

of the

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL

October 2022

About the Office of Science and Technology Policy

The Office of Science and Technology Policy (OSTP) was established by the National Science and Technology Policy, Organization, and Priorities Act of 1976 to provide the President and others within the Executive Office of the President with advice on the scientific, engineering, and technological aspects of the economy, security, health, foreign relations, and the environment. OSTP leads interagency science and technology policy coordination efforts, assists the Office of Management and Budget with an annual review and analysis of Federal research and development in budgets, and serves as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government. More information is available at http://www.whitehouse.gov/ostp.

About the National Science and Technology Council

The National Science and Technology Council (NSTC) is the principal means by which the Executive Branch coordinates science and technology policy across the diverse entities that make up the Federal research and development enterprise. A primary objective of the NSTC is to ensure that science and technology policy decisions and programs are consistent with the President's stated goals. The NSTC prepares research and development strategies that are coordinated across Federal agencies aimed at accomplishing multiple national goals. The work of the NSTC is organized under committees that oversee subcommittees and working groups focused on different aspects of science and technology. More information is available at http://www.whitehouse.gov/ostp/nstc.

About the NSTC Subcommittee on Advanced Manufacturing

Under section 102 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. §6622), as amended, the NSTC Committee on Technology is responsible for planning and coordinating Federal programs and activities in advanced manufacturing research and development and developing and updating a quadrennial national strategy for advanced manufacturing. The Subcommittee on Advanced Manufacturing (SAM) addresses these responsibilities and is the primary forum for information-sharing, coordination, and consensus-building among participating agencies regarding Federal policy, programs, and budget guidance for advanced manufacturing.

About this Document

This 2022 National Strategy for Advanced Manufacturing, developed by the SAM following extensive public outreach, is based on a vision for United States leadership in advanced manufacturing that will grow the economy, create quality jobs, enhance environmental sustainability, address climate change, strengthen supply chains, ensure national security, and improve healthcare. This vision will be achieved by developing and implementing advanced manufacturing technologies, growing the advanced manufacturing workforce, and building resilience into manufacturing supply chains. Strategic objectives are identified for each goal, along with national technical and program priorities and recommendations for the next four years.

Disclaimer

Reference in this document to any specific commercial product, process, service, manufacturer, company, or trademark is to provide clarity and does not constitute its endorsement or recommendation by the United States Government.

Copyright Information

This document is a work of the United States Government and is in the public domain (see 17 U.S.C. §105). Subject to the stipulations below, it may be distributed and copied with acknowledgment to OSTP. Copyrights to graphics included in this document are reserved by the original copyright holders or their assignees and are used here under the Government's license and by permission. Requests to use any images must be made to the provider identified in the image credits or to OSTP if no provider is identified. Published in the United States of America, 2022.

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL

Chair

Alondra Nelson, Deputy Assistant to the President and Performing the Duties of Director, White House Office of Science and Technology Policy

Executive Director

Kei Koizumi (Acting), Principal Deputy Director for Policy, White House Office of Science and Technology Policy

COMMITTEE ON TECHNOLOGY

SUBCOMMITTEE ON ADVANCED MANUFACTURING

Co-Chairs

Ezinne Uzo-Okoro, White House Office of Science and Technology Policy

Michael F. Molnar, National Institute of Standards and Technology

Robert Gold, Department of Defense

In Coordination with

Elisabeth Reynolds, National Economic Council

Susan Helper*, Office of Management and Budget

Executive Secretary

Said Jahanmir, National Institute of Standards and Technology

Members

Jonathan Alter, SBA

William Barrett, EPA

Diana Bauer*, DOE/EERE

Michael Britt-Crane*, DoD

Michael Clark, EOP/OMB

James Coburn, HHS/FDA

Matthew Di Prima, HHS/FDA

Robin Fernkas, DOL

Tracy Frost, DoD

Pam Frugoli, DOL

Frank Gayle, DOC/NIST

Lori Gillen, SBA

Robert Hampshire, DOT

Gregory Henschel*, ED

Firas Ibrahim, DOT

Justin Jackson, NASA

Erick Jones, DOS

Bruce Kramer*, NSF

Gretchen Kroh, USDA

Emily Lamont, ED

Astrid Lewis, DOS

Jerry Lorengo, DOC/USPTO

Susan Margulies, NSF

Blake Marshall, DOE/EERE

Kartik Sheth, NASA

Suzanne Thornsbury, USDA

John Vickers, NASA

Jay Vietas, HHS/NIOSH

Remy Yucel, DOC/USPTO

*Report Leadership

Table of Contents

Abbreviations and Acronyms ..... **iii**
Executive Summary **1**
Introduction: Manufacturing and America's Future **2**
Vision, Goals, Objectives, and Recommendations for Advanced Manufacturing **3**
Goals, Objectives, and Recommendations 4
Goal 1. Develop and Implement Advanced Manufacturing Technologies **6**
Objective 1.1. Enable Clean and Sustainable Manufacturing to Support Decarbonization 6
Objective 1.2. Accelerate Manufacturing for Microelectronics and Semiconductors 7
Objective 1.3. Implement Advanced Manufacturing in Support of the Bioeconomy 8
Objective 1.4. Develop Innovative Materials and Processing Technologies 9
Objective 1.5. Lead the Future of Smart Manufacturing 10
Goal 2. Grow the Advanced Manufacturing Workforce **11**
Objective 2.1. Expand and Diversify the Advanced Manufacturing Talent Pool 12
Objective 2.2. Develop, Scale, and Promote Advanced Manufacturing Education and Training 13
Objective 2.3. Strengthen the Connections Between Employers and Educational Organizations 14
Goal 3. Build Resilience into Manufacturing Supply Chains **14**
Objective 3.1. Enhance Supply Chain Interconnections 15
Objective 3.2. Expand Efforts to Reduce Manufacturing Supply Chain Vulnerabilities 15
Objective 3.3. Strengthen and Revitalize Advanced Manufacturing Ecosystems 16
Additional Interagency Contributors **18**
Appendix A. Agency Participation and Metrics **A-1**
Appendix B. Progress Made in Achieving the Objectives from the 2018 Strategic Plan **B-1**
Appendix C. Recommendations in Detail **C-1**

Abbreviations and Acronyms

2D/3D	two-dimensional/three-dimensional
AI	artificial intelligence
AM	additive manufacturing
AR	augmented reality
BARDA	Biomedical Advanced Research and Development Authority
BEA	Bureau of Economic Analysis
CAP	cross-agency priority
CEA	Council of Economic Advisors
CMOS	Complementary Metal Oxide Semiconductor
COVID-19	Coronavirus disease 2019
CO_2	carbon dioxide
CTE	career and technical education
DEIA	Diversity, Equity, Inclusion, and Accessibility
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
DOS	Department of State
ED	Department of Education
EDA	Economic Development Administration
EERE	Office of Energy Efficiency and Renewable Energy
EOP	Executive Office of the President
FDA	Food and Drug Administration
FY	fiscal year
GHG	greenhouse gas
HHS	Department of Health and Human Services
HI	heterogeneous integration
IC	integrated circuit
ICME	integrated computational materials engineering
I-Corps	Innovation Corps
IoT	internet of things
IIoT	industrial internet of things
IPCC	Intergovernmental Panel on Climate Change
ISM	in-space manufacturing
IT	information technology
K-12	kindergarten through high school
LGBTQ	lesbian, gay, bisexual, transgender, and questioning
MEP	Manufacturing Extension Partnership
MGI	Materials Genome Initiative
MIC	made in China
ML	machine learning
MSI	minority-serving institution
MRL	manufacturing readiness level
NEC	National Economic Council
NASA	National Aeronautics and Space Administration
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NSF	National Science Foundation
NSTC	National Science and Technology Council
OEM	original equipment manufacturer
OMB	Office of Management and Budget

OSTP	Office of Science and Technology Policy
OT	operational technology
PPE	personal protective equipment
Perkins V	Perkins Career and Technical Education Act
R&D	research and development
RFID	radio frequency identification
SAM	Subcommittee on Advanced Manufacturing
SBA	Small Business Administration
SBIR	Small Business Innovation Research
SMMs	small and medium-sized manufacturers
STEM	science, technology, engineering, and mathematics
STTR	Small Business Technology Transfer
TRL	technology readiness level
R&D	research and development
U.S.	United States
USDA	United States Department of Agriculture
USPTO	U.S. Patent and Trademark Office
VR	virtual reality
WIOA	Workforce Innovation and Opportunity Act
XR	extended reality

Executive Summary

Manufacturing is an engine of America's economic strength and national security. It plays a vital role in almost every sector of the United States economy, from aerospace to biopharmaceuticals and beyond. Advances in manufacturing enable the economy to continuously grow as new technologies and innovations increase productivity, enable next-generation products, support our capability to address the climate crisis, and create new, high-quality, and higher-paying jobs.

The United States remains a leader in advanced technologies; however, production and employment in several high-technology manufacturing industries have fallen sharply in the 21st century. To address global competition, the Biden-Harris Administration has taken steps to revitalize the manufacturing sector, increase the resilience of U.S. supply chains and national security, invest in R&D, and train Americans for jobs of the future.

This Strategy presents **a vision for United States leadership in Advanced Manufacturing** that will grow the economy, create jobs, enhance environmental sustainability, address climate change, strengthen supply chains, ensure national security, and improve healthcare.

Three interrelated goals are set to achieve the stated vision:

(1) Develop and implement advanced manufacturing technologies;

(2) Grow the advanced manufacturing workforce; and

(3) Build resilience into manufacturing supply chains.

To achieve these goals, 11 strategic objectives and 37 technical and program recommendations are identified for the next four years. The objectives are selected to:

(1) Enable clean and sustainable manufacturing to support decarbonization;
(2) Accelerate manufacturing innovation for microelectronics and semiconductors;
(3) Implement advanced manufacturing in support of the bioeconomy;
(4) Develop innovative materials and processing technologies;
(5) Lead the future of smart manufacturing;
(6) Expand and diversify the advanced manufacturing talent pool;
(7) Develop, scale, and promote advanced manufacturing education and training;
(8) Strengthen connections between employers and educational organizations;
(9) Enhance supply chain interconnections;
(10) Expand efforts to reduce supply chain vulnerabilities; and
(11) Strengthen and revitalize advanced manufacturing ecosystems.

This Congressionally-mandated strategy seeks to improve U.S. Government coordination and provide long-term guidance for Federal programs and activities in support of U.S. manufacturing competitiveness, including advanced manufacturing research and development. Public input from over 700 individuals and organizations from across the country informed the strategy.

Introduction: Manufacturing and America's Future

Advanced manufacturing is defined as the innovation of improved methods for manufacturing existing products, and the production of new products enabled by advanced technologies. The United States remains a global leader in several advanced technologies.[1] Domestic and global demand has skyrocketed for the technologies and equipment needed to address the climate crisis. However, production and employment have fallen sharply in several advanced manufacturing industries. The trade balance in advanced technology products—a traditional strength of the United States—shifted from surplus to deficit starting in 2001, with a trade deficit of $197 billion in 2021.[2]

Manufacturing is one of the largest sectors of the United States economy[3,4] accounting for 11 percent of gross domestic product.[5] While relatively constant from 1960 through 1990, employment in the manufacturing sector began declining in the late 1990s; in the decade from 2000 to 2010, one-third of U.S. manufacturing workers (nearly six million people) lost their jobs.[6] Fewer than two million of those jobs have been regained. Notably, however, manufacturing employment is now above its 2020 peak, the first time since 1978 that it has exceeded its previous business cycle peak.

The COVID-19 global pandemic exposed the fragility of manufacturing supply chains, causing major shortages of key products such as medical supplies, critical minerals, and semiconductors.[7] To strengthen the manufacturing supply chain, small and medium size manufacturers (SMMs)—those who employ fewer than 500 workers, comprise 98% of the total number of manufacturers and account for 43% of the employees[8]—will require assistance from the United States Government and their larger customers and suppliers.

It is, therefore, imperative for the United States to develop and implement strategies to regain American leadership through investments in advanced manufacturing. Furthermore, the nation's manufacturing and industrial base underpins the U.S. military capabilities using advanced technologies to secure our democracy.

This Strategy updates the 2018 *Strategy for American Leadership in Advanced Manufacturing*[9]using public input.[10] It is mandated by the America COMPETES Reauthorization Act of 2010 which mandated the original advanced manufacturing strategy (of 2012) and updates every 5 years.[11] Appendix A illustrates Federal agency participation and metrics. Appendix B summarizes progress made since the publication of the *2018 Strategy.*

[1] https://itif.org/publications/2022/06/08/the-hamilton-index-assessing-national-performance-in-the-competition-for-advanced-industries/
[2] https://www.census.gov/foreign-trade/balance/c0007.html
[3] https://www.nist.gov/el/applied-economics-office/manufacturing/manufacturing-industry-statistics
[4] https://www.bls.gov/web/empsit/ceshighlights.pdf
[5] https://data.worldbank.org/indicator/NV.IND.MANF.ZS
[6] https://data.bls.gov/timeseries/CES3000000001[7] https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf
[7] https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf
[8] https://cdn.advocacy.sba.gov/wp-content/uploads/2021/08/30144808/2021-Small-Business-Profiles-For-The-States.pdf
[9] https://www.manufacturing.gov/news/announcements/2018/10/strategy-american-leadership-advanced-manufacturing
[10]https://www.Federalregister.gov/documents/2021/10/05/2021-21644/national-strategic-plan-for-advanced-manufacturing-request-for-information?utm_medium=email&utm_source=govdelivery
[11] America COMPETES Reauthorization Act of 2010 (Pub L. 111-478) §102; 42 U.S.C. §6622.

Vision, Goals, Objectives, and Recommendations for Advanced Manufacturing

This Strategy is designed to realize a vision for U.S. leadership in Advanced Manufacturing that will grow the economy, create high-quality jobs, enhance environmental sustainability, address climate change, strengthen supply chains, ensure national security, and improve healthcare.

Grow the Economy. Advanced manufacturing applies innovative technologies to produce new products and improve the production of existing products. Manufacturing jobs, and especially those in advanced technologies, provide better pay, more consistent hours, and stronger worker protection than the labor market as a whole and have broad impacts on jobs in other sectors[12]. These significant impacts make advances in manufacturing—and America's ability to translate those advances into products, processes, and services—an Administration priority and a key element of the nation's overall manufacturing strategy.[13]

Create High-Quality Jobs. Innovation and implementation of new technologies in advanced manufacturing requires a highly skilled and diverse workforce. The National Association of Manufacturers estimates that the United States could have more than two million unfilled manufacturing jobs by 2030.[14] Renewed investment in workers is needed, including education in foundational science ranging from elementary school through post-graduate degrees, technical training programs with industry-recognized credentials, apprenticeships and internships, and leadership development programs. The inclusion of individuals from groups historically underrepresented in advanced manufacturing and/or from underserved regions creates the opportunity to expand the manufacturing workforce and the concomitant economic benefit. The U.S. will prioritize upskilling the workforce and increasing the quantity and quality of advanced manufacturing jobs in rural areas and economically distressed regions to strengthen regional economic conditions, while recognizing the benefits of clustered economic development.[15,16] The U.S. will also invest in manufacturing processes which protect worker safety and health; such safety and human-centered processes, which protect and keep workers on the job, are essential to long-term global competitiveness.

Enhance Environmental Sustainability. Sustainable manufacturing is the creation of manufactured products through economically-sound processes that minimize negative environmental impacts while conserving energy and natural resources.[17] Incorporating sustainable material management principles and additive manufacturing into product design and development reduces the amount of material and energy required to manufacture a product and increases safety. The United States will improve environmentally favorable processes throughout the manufacturing sector, including the efficient use of clean electricity in materials processing and manufacturing, and in water processing.

Address Climate Change. The climate crisis poses an immediate and existential threat to national and global security, environmental and human health, and economic interests. The United States has committed to an ambitious and achievable goal to reduce net greenhouse gas (GHG) emissions 50-52

[12] https://www.epi.org/publication/manufacturing-still-provides-a-pay-advantage-but-outsourcing-is-eroding-it/
[13] https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/24/the-biden-harris-plan-to-revitalize-american-manufacturing-and-secure-critical-supply-chains-in-2022/
[14] https://www.nam.org/2-1-million-manufacturing-jobs-could-go-unfilled-by-2030-13743/
[15] https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/
[16] https://eda.gov/arpa/build-back-better/
[17] https://www.epa.gov/sustainability/sustainable-manufacturing

percent below 2005 levels in 2030, create a carbon pollution-free power sector by 2035, and achieve net-zero emissions economy-wide by 2050.[18,19] Advanced manufacturing solutions can unleash new opportunities to cut pollution and reduce carbon emissions via industrial decarbonization, building a more circular economy, using sustainable biomass to replace petroleum-based products, and scaling up manufacturing of clean energy and other climate-aligned technologies, incorporating game-changing innovations to help achieve net-zero emissions across the entire economy.

Strengthen Supply Chains. The supply chains and ecosystems that support U.S.-based manufacturing have been weakened by several factors, including underinvestment in innovative technologies, insufficient investment in training, and outsourcing and offshoring for short-term gains.[20] The COVID-19 pandemic and shifting geopolitical competition have exposed these and other vulnerabilities, exacerbating economic loss while also revealing national security and health risks. The United States needs resilient, collaborative, and digitally integrated manufacturing supply chains to prevent and recover quickly from disruptions.

Ensure National Security. Advanced manufacturing technologies are critical to national security, delivering innovative capabilities to our nation's warfighters so the United States can sustain and strengthen defense against our most consequential strategic competitors.[21] Recognizing the increase in non-kinetic threats to the United States from strategic competitors, the nation must accelerate the pace of technology development and implementation as well as transformation of our manufacturing supply chains.

Improve Healthcare. Advanced manufacturing can be used to produce numerous new and improved healthcare products, including small-molecule drugs, medical devices, biologics, vaccines, advanced therapies, and biocompatible materials. While biomedical manufacturing shares many cross-cutting technology needs with other sectors, it also has unique needs that dictate specifically tailored applications. Manufacturing processes and solutions must ensure safety and efficacy, promote human and animal health, and minimize drug shortages, while also securing the U.S. global leadership in pandemic response and preparedness.

Goals, Objectives, and Recommendations

This Strategy's vision will be accomplished through the pursuit of three goals. Attaining these goals requires achieving the strategic objectives and recommendations outlined under each goal. The goals, objectives, and recommendations for the next four years appear on the following pages. Appendix C contains further discussion of each recommendation.

[18] https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/

[19] https://www.Federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad

[20] While some offshoring and outsourcing has promoted efficiency, these strategies have sometimes also led to increased vulnerability and reduced job quality. See chapter 6 of https://www.whitehouse.gov/cea/written-materials/2022/04/14/summary-of-the-2022-economic-report-of-the-president/ and https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf

[21] https://www.defense.gov/Spotlights/National-Defense-Strategy/

Goals	Objectives	Recommendations
Goal 1: Develop and Implement Advanced Manufacturing Technologies	1.1: Enable Clean and Sustainable Manufacturing to Support Decarbonization	1.1.1: Decarbonization of Manufacturing Processes
		1.1.2: Clean Energy Manufacturing Technologies
		1.1.3: Sustainable Manufacturing and Recycling
	1.2: Accelerate Manufacturing for Microelectronics and Semiconductors	1.2.1: Nanomanufacturing of Semiconductors and Electronics
		1.2.2: Semiconductor Materials, Design, and Fabrication
		1.2.3: Semiconductor Packaging and Heterogeneous Design
	1.3: Implement Advanced Manufacturing in Support of the Bioeconomy	1.3.1: Biomanufacturing
		1.3.2: Agriculture, Forest, and Food Processing
		1.3.3: Biomass Processing and Conversion
		1.3.4: Pharmaceuticals and Healthcare Products
	1.4: Develop Innovative Materials and Processing Technologies	1.4.1: High-Performance Materials Design and Processing
		1.4.2: Additive Manufacturing
		1.4.3: Critical Materials
		1.4.4: In-Space Manufacturing
	1.5: Lead the Future of Smart Manufacturing	1.5.1: Digital Manufacturing
		1.5.2: AI in Manufacturing
		1.5.3: Human-Centered Technology Adoption
		1.5.4: Cybersecurity in Manufacturing
Goal 2: Grow the Advanced Manufacturing Workforce	2.1: Expand and Diversify the Advanced Manufacturing Talent Pool	2.1.1: Promote Awareness of Advanced Manufacturing Careers
		2.1.2: Engage Underrepresented Communities
		2.1.3: Address Social and Structural Barriers for Underserved Groups
	2.2: Develop, Scale, and Promote Advanced Manufacturing Education and Training	2.2.1: Incorporate Advanced Manufacturing into Foundational STEM Education
		2.2.2: Modernize Career Technical Education for Advanced Manufacturing
		2.2.3: Expand and Disseminate New Learning Technologies and Practices
	2.3: Strengthen the Connections Between Employers and Educational Organizations	2.3.1: Expand Work-Based Learning and Apprenticeships
		2.3.2: Establish Industry-Recognized Credentials and Certifications
Goal 3: Build Resilience into Manufacturing Supply Chains	3.1: Enhance Supply Chain Interconnections	3.1.1: Foster Coordination within Supply Chains in Supply Chain Management
		3.1.2: Advance Innovation for Digital Transformation of Supply Chains
	3.2: Expand Efforts to Reduce Manufacturing Supply Chain Vulnerabilities	3.2.1: Trace Information and Products Along Supply Chains
		3.2.2: Increase Visibility into Supply Chains
		3.2.3: Improve Supply Chain Risk Management
		3.2.4: Stimulate Supply Chain Agility
	3.3: Strengthen and Revitalize Advanced Manufacturing Ecosystems	3.3.1: Promote New Business Formation and Growth
		3.3.2: Support Small and Medium-sized Manufacturers
		3.3.4: Assist Technology Transition
		3.3.4: Build and Strengthen Regional Manufacturing Networks
		3.3.5: Improve Public Private Partnerships

Goal 1. Develop and Implement Advanced Manufacturing Technologies

Recent advances in areas such as automation, data science, artificial intelligence, machine learning, biotechnology, and materials science, combined with urgent technical challenges in economy-wide decarbonization, healthcare, and national security are creating new opportunities for advanced manufacturing. In order to compete globally, the United States must leverage and protect its technology leadership through rapid development and implementation of innovative manufacturing technologies.

While typical Federal investments in advanced manufacturing-related research, development, and deployment focus on mission-specific goals within each agency, portfolio-based strategies coordinated across agencies would be more effective. Public-private partnerships to advance targeted technology sectors are key to developing and implementing new manufacturing technologies. Such public-private partnerships present the opportunity to create and share industry-relevant facilities where colocation of tools, technology, and embedded expertise can expand regional innovation ecosystems and drive economic growth both within and across regions.

Five strategic objectives have been identified under Goal 1:

1.1. Enable Clean and Sustainable Manufacturing to Support Decarbonization
1.2. Accelerate Manufacturing Innovation for Microelectronics and Semiconductors
1.3. Implement Advanced Manufacturing in Support of the Bioeconomy
1.4. Develop Innovative Materials and Processing Technologies
1.5. Lead the Future of Smart Manufacturing

For each objective, a set of recommendations is identified, with outcomes to be accomplished over the next four years.

Objective 1.1. Enable Clean and Sustainable Manufacturing to Support Decarbonization

Climate change is caused by the total amount of carbon dioxide and other greenhouse gases (GHG) added and persisting in the atmosphere. The manufacturing sector accounts for approximately one-third of the nation's primary energy usage and 30 percent of energy-related GHG emissions.[22,23] Manufacturing of industrial materials such as steel, cement, and chemicals also produces GHG emissions directly via chemical processes. Reduction of manufacturing-related energy consumption and GHG emissions is possible through the use of clean and efficient manufacturing technologies[24] and reduction of emissions over the full product life cycle.

The United States has committed to 50-52 percent reduction of net GHG emissions below 2005 levels in 2030, and net-zero by 2050.[25] The Inflation Reduction Act, signed into law in August 2022, in combination with the infrastructure modernization investments in the Bipartisan Infrastructure Law enacted in November 2021, will provide significant resources and incentives to help reach the climate and clean energy goals. These new resources will facilitate the efforts of the Biden-Harris Administration, via the National Climate Task Force and the Executive Order on America's Supply Chains, to advance clean energy and climate-aligned manufacturing across the U.S. government. The

[22] https://www.eia.gov/energyexplained/use-of-energy/industry.php;
[23] https://www.eia.gov/tools/faqs/faq.php?id=77&t=11
[24] https://www.whitehouse.gov/bipartisan-infrastructure-law/
[25] https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/

manufacturing sector will be integral in these decarbonization efforts given the opportunities to decarbonize the manufacturing processes themselves, as well as the opportunities to scale up U.S. manufacturing of zero carbon equipment. Advanced manufacturing can enable lower cost, zero emission technologies in the energy, industrial, construction, and transportation sectors.

The recommendations for this objective are:

1.1.1. Decarbonization of Manufacturing Processes: *Develop and demonstrate advanced manufacturing technologies that increase energy efficiency, electrify industrial processes, employ low-carbon feedstocks and energy sources in manufacturing, support new chemistries that avoid direct greenhouse gas emissions from industrial processes, capture and store industrial carbon dioxide, and create alternatives to GHG-intensive industrial products. Create and disseminate validation tools and processes to assist the integration of electrified and efficient technologies into manufacturing. Create transparency on advanced materials and processes with lower energy and carbon footprints.*

1.1.2. Clean Energy Manufacturing Technologies: *Improve materials, manufacturing processes and product designs for clean electricity generation and storage; zero-emission transportation, buildings, and industry to enable a decarbonized economy. Enhance the manufacturing of devices and materials that enable more efficient power conversion and transmission with advanced conducting materials, processing technologies and machine development. Manufacture advanced batteries with high energy densities and secure novel sustainable materials for low- and high-voltage applications.*

1.1.3. Sustainable Manufacturing and Recycling: *Develop economically viable manufacturing technologies that separate valuable materials from waste streams, as well as alternatives to energy- or pollution-intensive materials. Conduct R&D in the areas of sorting, purification, and deconstruction technologies. Scale up sustainable materials design and manufacturing, recycling and circular methods for multiple materials classes, and pilot programs and facilities. Improve data and methods to assess life cycle impacts and identify areas for improvement.*

Objective 1.2. Accelerate Manufacturing for Microelectronics and Semiconductors

Semiconductors are the foundation of microelectronics, and advances in semiconductor technology are critical for national security and for almost every sector of the economy.[26] They are the backbone of power electronic devices that control and condition the flow of electricity, enabling the charging of electric vehicles and integrating renewable energy sources into the power grid. The ubiquity of microelectronics provides opportunities to magnify sustainable manufacturing processes that account for climate, environmental, and other impacts over the product life cycle. The manufacturing industry faces fundamental performance limitations of complementary metal oxide semiconductor technology, diversification of the market beyond processors and memory, and intense global competition.

Future performance improvements require research into manufacturing and processing capabilities for new microelectronic materials, devices, and interconnect solutions that will power future computing and storage devices. The recent passage of the CHIPS and Science Act[27] into law in August of 2022, which provides investments in semiconductor infrastructure, will help achieve the objectives below.

[26] https://www.epa.gov/smm-electronics/national-strategy-electronics-stewardship-nses

[27] https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/

The recommendations for this objective are:

1.2.1. Nanomanufacturing of Semiconductors and Electronics: *Invest in fabrication of integrated photonics, additive and direct printed electronics, unique sensor formats, and hybrid electronic fabrication to harness the power of nanomanufacturing. Develop physical, chemical, and biological methods to precisely place and bind atoms into desired molecules and structures.*

1.2.2. Semiconductor Materials, Design, and Fabrication: *Develop advanced manufacturing capabilities that allow the creation and testing of new devices, materials, and architectures. Provide easy access to design tools and microelectronics foundries for domestic companies and universities that provide fundamental insights and a trained workforce. Incorporate efficient and sustainable operations for microelectronics devices and components.*

1.2.3. Semiconductor Packaging and Heterogeneous Design: *Introduce new materials, tools, designs, processes, assembly, and tests for advanced packaging with higher densities, yields, and reliability. Enhance R&D and prototyping to improve manufacturing throughput and reliability. Develop national facilities for heterogeneous packaging integration R&D.*

Objective 1.3. Implement Advanced Manufacturing in Support of the Bioeconomy

The United States bioeconomy is "economic activity that is driven by innovation in the life sciences and biotechnology, and that is enabled by technological advances in engineering and in computing and information sciences"[28] and includes industries, products, and services. In biomanufacturing, microbes and different organisms (bacterial cells, viruses, yeast, cyanobacteria, algae) can be programmed to make a variety of products such as food, feeds, fuels, fibers, bioplastics, natural rubbers, renewable chemicals, nutraceuticals, non-food materials, and other high value products. This process," utilizes sustainable biomass or a sugar source as the feedstock, providing an alternative to petrochemical-based production for many products like plastics, fuels, and materials.

In September 2022, President Biden signed an Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy.[29] This Executive Order calls for a whole-of-government approach to advance biomanufacturing to provide innovative solutions in health, climate, change, energy, food security, agriculture, supply chain resilience, and national and economic security. Priorities in the Executive Order are also outlined in this Strategy document, which include expanding domestic biomanufacturing capacity, connecting relevant infrastructure, and growing the biomanufacturing workforce.

Manufacturing is essential to next-generation medical therapies and devices that have biological interfaces with both humans and animals. By combining life science discoveries with advanced technologies such as those in smart manufacturing, the United States can make extensive leaps forward in the creation of high-quality bio-based products. Implementation of robust biosafety, biosecurity, and data privacy controls should be prioritized to ensure support of a bioeconomy that promotes and protects U.S. leadership, competitiveness, and national security.

To continue improving food safety, and food accessibility, and food supply chain resilience, advanced manufacturing processes must fully leverage new technologies and accelerate new fields such as cellular agriculture, alternative proteins, and personalized nutrition. Steps should be taken to create

[28] https://nap.nationalacademies.org/catalog/25525/safeguarding-the-bioeconomy
[29] https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/12/executive-order-on-advancing-biotechnology-and-biomanufacturing-innovation-for-a-sustainable-safe-and-secure-american-bioeconomy/

more opportunities to further pursue lab-to-market biotechnologies and develop manufacturing scale-up and scale-out of emerging products. This section on manufacturing technologies addresses critical issues in health, disease, climate change, energy, food and nutrition security, economic development, and the continued development of a diverse and multi-disciplinary workforce.

The recommendations for this objective are:

1.3.1 Biomanufacturing: *Support research to advance biomanufacturing including genomic and protein engineering production tools, engineering of multicellular systems, biological models, and biotechnology methods for bioprocessing. Support advancement in multi-omics and bio-metrology for predictive modeling and bioprocessing analytical tools. Support enhancement of feedstock readiness, technical readiness, and manufacturing readiness level analytical tools. Prioritize implementation of safeguards to ensure that these products are not used for nefarious purposes.*

1.3.2 Agriculture, Forest, and Food Processing: *Support research in advanced genome sequencing, bioinformatics, predictive modeling for functional phenotypes, and integration of control systems and the teaming of humans and machines in food, feed, fuel, and fiber manufacturing. Develop sustainable energy low-cost water processing technologies including nutrient recovery systems that produce fit-for-purpose water from waste streams and unconventional sources.*

1.3.3 Biomass Processing and Conversion: *Develop methods, processes, and technologies to tap into the one billion tons of biomass that could be sustainably produced in the U.S. and converted into feedstocks for manufacturing. Advance predictive process modeling, biological process analysis and genomic and protein engineering for desirable biomass feedstock pre-processing, processing, and deconstruction. Advance anaerobic treatment of bio-based waste streams to produce biogas, renewable natural gas, fertilizer, plant nutrients, soil amendments, biochar, engineered carbon, animal bedding material, surfactants, polymers, clean bioenergy, electricity, and combined heat/cooling power.*

1.3.4 Pharmaceuticals and Healthcare Products: *Advance continuous manufacturing, in-line process monitoring and control, integrated AI-assisted systems, and novel cell culture techniques. Prioritize developments in subtractive and additive machining and biobased manufacturing to create patient-specific medical products, devices, and biologically-driven drug delivery systems.*

Objective 1.4. Develop Innovative Materials and Processing Technologies

Advanced materials are essential for the development of new products and economic and national security, with applications across multiple industrial sectors. Advanced materials may include extreme-temperature structural materials used in hypersonics, materials for harsh environments, high-strength lightweight metal alloys, synthetic biologic materials, and many others. Using new materials often requires innovative manufacturing techniques. Advanced processes like additive manufacturing and nanomanufacturing create opportunities for new materials as design constraints are greatly relaxed. Processing technologies for new high-performance advanced materials can increase cost-effectiveness and competitiveness by replacing (or complementing) prevailing methods with faster, more efficient, precise, and robust methods. Advanced materials and processes can reduce life cycle greenhouse gases and other environmental consequences in manufacturing and product use.

The recommendations for this objective are:

1.4.1. High-Performance Materials Design and Processing: *Advance material design and processing capabilities through the integration of physics-based computational and data-driven*

machine learning tools. Accelerate testing, qualification and process validation of high-performance materials to streamline entry into market. Develop predictive capabilities for materials behavior and performance under harsh service conditions.

1.4.2. Additive Manufacturing: *Develop additive manufacturing (AM) process optimization frameworks that are accessible to all users. Create new sensors to advance process monitoring and control capabilities. Develop machine learning algorithms to analyze large, secure, interoperable data streams and realize feedback control. Produce tools to create new AM-specific materials and capabilities. Integrate additive manufacturing technologies with smart manufacturing platforms.*

1.4.3. Critical Materials: *Identify and integrate substitute materials and technologies to reduce or replace the use of critical materials in high-demand technologies. Develop advanced separation and processing methods for critical materials from primary, secondary, and unconventional sources. Develop design and manufacturing methods for critical components and products that can be reused, recycled, remanufactured, and repurposed.*

1.4.4. In-Space Manufacturing: *Develop new additive manufacturing processes in microgravity environments to create replacement parts and space infrastructure. Enable integration of robotics with in-space additive manufacturing processes for deep space exploration. Prioritize biomanufacturing investments in microgravity to enable extended space presence including sustainable food production, processing, and recycling, and the deactivation of hazardous materials.*

Objective 1.5. Lead the Future of Smart Manufacturing

Smart manufacturing via digital design and manufacturing collects and distributes the information needed by production equipment to transform designs and raw materials into products, resulting in a highly connected industrial enterprise that can span a single company or across an entire supply chain. Smart manufacturing distributes relevant information to every level of the enterprise, from the factory floor to the C-suite, thus improving product quality and traceability while reducing cost.

The Industry 4.0 paradigm describes transformational changes to technology, industry, and societal patterns and processes brought on by increased interconnectivity and smart automation. Future advances depend on the widespread adoption of a robust digital infrastructure in manufacturing, the availability of a digital-fluent workforce, and the creation of AI-powered manufacturing business models that aggregate data across manufacturers while protecting proprietary information. Such aggregation will provide manufacturing companies with better solutions than each company can develop on its own by giving them the benefit of accumulated production experience of all firms engaged in the network.[30]

The recommendations for this objective are:

1.5.1. Digital Manufacturing: *Enable the application of advanced sensing, control technologies, and machine learning across the manufacturing sector. Advance smart manufacturing by pursuing digital twins. Develop standards for data compatibility to enable seamless integration of smart manufacturing.*

1.5.2. Artificial Intelligence in Manufacturing: *Prioritize R&D in machine learning, data access, confidentiality, encryption, and risk assessment to enable the adoption of artificial intelligence in manufacturing. Develop best practices, standards, and software tools to scale new business models*

[30] https://doi.org/10.6028/NIST.AMS.100-47

that monetize production data while maintaining data security and respecting intellectual property rights. Balance the interests of producers and consumers in areas such as privacy, intellectual property, and rights to repair.[31]

1.5.3. Human-Centered Technology Adoption: *Promote the development of new technologies and standards that expand collaborative work between humans and machines by enabling safe and efficient human-machine interactions that augment human capabilities and empower production workers.*

1.5.4. Cybersecurity in Manufacturing: *Develop standards, tools, and testbeds, and disseminate guidelines for implementing cybersecurity in smart manufacturing systems. Focus efforts on updating the capital equipment of SMMs and replacing production equipment that cannot be made cybersecure. Provide purchasers a Software Bill of Materials for each product directly or by public release per President's Executive Order 14028 on Improving the Nation's Cybersecurity.*

Goal 2. Grow the Advanced Manufacturing Workforce

Transformational changes in advanced technology hold the promise of creating millions of new, sustainable, high-quality American jobs, including in advanced manufacturing.[32] Although there remains some disagreement, most evidence suggests that automation, artificial intelligence, and robotics will yield a net worldwide increase of manufacturing jobs over the coming decade.[33] These technologies should be developed and deployed in a way that complements workers' skills, rather than substituting for them.[34] To sustain and grow a robust advanced manufacturing industry with high-quality jobs, the United States must grow the manufacturing workforce with a particular emphasis on including individuals from backgrounds historically underrepresented in STEM fields, and develop the skills of its workers with agile education and training systems that keep pace with innovation. Work-based learning models such as registered apprenticeships have shown many benefits for both workers and employers.[35]

The Federal Government can provide leadership in growing the manufacturing workforce by promoting a vision of advanced manufacturing workforce development that unifies public and private stakeholders, and by increasing coordination of Federal policies and programs across agencies to maximize overall effectiveness and enable place-based initiatives.

Three strategic objectives have been identified under Goal 2:

2.1. Expand and Diversify the Advanced Manufacturing Talent Pool
2.2. Develop, Scale, and Promote Advanced Manufacturing Education and Training
2.3. Strengthen Connections Between Employers and Educational Organizations

[31] https://www.whitehouse.gov/briefing-room/presidential-actions/2021/07/09/executive-order-on-promoting-competition-in-the-american-economy/
[32] https://www.nber.org/papers/w30332?utm_campaign=ntwh&utm_medium=email&utm_source=ntwg22
[33] https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth/; see also https://mitpress.mit.edu/9780262367745/the-work-of-the-future/
[34] https://workofthefuture.mit.edu/wp-content/uploads/2021/01/2021-Research-Brief-Helper-Reynolds-Traficonte-Singh4.pdf
[35] https://wol.iza.org/articles/do-firms-benefit-from-apprenticeship-investments/long and https://www.aspeninstitute.org/wp-content/uploads/2019/01/1.3-Pgs-56-74-Scaling-Apprenticeship-to-Increase-Human-Capital.pdf

Objective 2.1. Expand and Diversify the Advanced Manufacturing Talent Pool

According to recent surveys, an estimated 2.1 million manufacturing jobs could be unfilled by 2030 unless the United States acts quickly.[36] Thus, increasing worker compensation is a key way to increase the attractiveness of manufacturing as a career.[37] Strategies to meet the anticipated demand for workers include broadening and diversifying the demographic base of the manufacturing workforce. To meet the coming workforce challenge, people from backgrounds historically underrepresented in STEM and women from all backgrounds, including returning citizens, will need to participate at much higher rates. Further, expanding and diversifying the advanced manufacturing workforce will also enhance innovation, resilience, and performance.

The Biden-Harris Administration has launched several initiatives to grow the manufacturing workforce. The Good Jobs Initiative will provide information to workers, employers, and government entities as they seek to improve job quality and create access to good union jobs.[38] The Talent Pipeline program helps employers build sector partnerships to connect workers to good jobs.[39] Further, the Administration made efforts to expand registered apprenticeships,[40] and provided funding for industry-led, worker-centered partnerships.[41] The National Biotechnology and Biomanufacturing Initiative aims to expand the biomanufacturing workforce with an emphasis on promoting equity and supporting underserved communities.[42] These efforts will deliver significant manufacturing-related benefits.

The recommendations for this objective are:

2.1.1. Promote Awareness of Advanced Manufacturing Careers: *Promote awareness of advanced manufacturing careers with coordinated campaigns and events tailored to inspire students, with particular focus on people from backgrounds historically underrepresented in advanced manufacturing. Work with institutions and community leaders, and provide touchpoints with industry, particularly through hands-on experiences.*

2.1.2. Engage Underrepresented Communities: *Institutionalize industry-led capacity-building partnerships that work with community colleges and area high schools to engage students and families from backgrounds underrepresented in advanced manufacturing and in underserved communities, particularly those transitioning from fossil-fuel based industries. Actively engage colleges and universities, with a focus on minority-serving institutions. Clearly define shared goals, strategies, and resources among partners, including unions and community representatives. Implement industry-wide technical assistance, support services, and mentorship for people from underserved communities.*

[36] https://www2.deloitte.com/us/en/insights/industry/manufacturing/manufacturing-industry-diversity.html
[37] https://hrexecutive.com/cappelli-no-hr-we-dont-have-a-labor-shortage-crisis/
[38] https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/02/president-biden-to-announce-21-winners-of-1-billion-american-rescue-plan-regional-challenge/
[39] https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/17/fact-sheet-the-biden-harris-administration-launches-the-talent-pipeline-challenge-supporting-employer-investments-in-equitable-workforce-development-for-infrastructure-jobs/
[40] https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/01/fact-sheet-biden-harris-administration-launches-the-apprenticeship-ambassador-initiative-to-create-equitable-debt-free-pathways-to-high-paying-jobs/
[41] https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/02/president-biden-to-announce-21-winners-of-1-billion-american-rescue-plan-regional-challenge/
[42] https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/12/fact-sheet-president-biden-to-launch-a-national-biotechnology-and-biomanufacturing-initiative/

2.1.3. Address Social and Structural Barriers for Underserved Groups: *Ensure that Federal programs drive towards diversity, equity, inclusion and accessibility by establishing standards, policies, related metrics, evaluations, and accountability. Require inclusion plans for Federally-sponsored grants to ensure opportunities for veterans and people from backgrounds historically underrepresented and underserved communities in advanced manufacturing.*

Objective 2.2. Develop, Scale, and Promote Advanced Manufacturing Education and Training

Education and workforce development systems must be capable of responding with agility to the changing mix of skills and competencies needed for advanced manufacturing. To reach more students and to promote advanced manufacturing education, pedagogy must continue to explore new techniques and delivery systems. This means developing and making more widely-available sector partnership training programs[43] as well as a greater number of dynamic and engaging distance learning and hybrid courses (that combine virtual and in-person instruction). It also means scaling up more real-world, hands-on, work-based learning opportunities for students in advanced manufacturing programs.

Changes in education and training begin with advanced manufacturing awareness in the early foundations of STEM education and continue through postsecondary career and technology education programs, employer-based training, and apprenticeship and other work-based programs.

The recommendations for this objective are:

2.2.1. Incorporate Advanced Manufacturing into Foundational STEM Education: *Extend the elementary and secondary STEM improvement agenda to incorporate key concepts, foundational knowledge, and skills for advanced manufacturing technologies. Raise awareness for multiple career pathways and enhance industry engagement to provide students with hands-on training opportunities. Support technical education and STEM programs with a stronger focus on engineering and technology. Prepare teachers to lead exciting, learning-intensive student projects that integrate advanced manufacturing concepts and careers.*

2.2.2. Modernize Career and Technical Education (CTE) for Advanced Manufacturing: *Modernize and scale CTE through grants and industry-based efforts that strengthen teaching and learning to improve student engagement and outcomes and inspire student interest in manufacturing careers. Prepare teachers and postsecondary faculty to teach courses that deliver both academic knowledge and skills for advanced manufacturing using updated instructional methods. Support student competition opportunities that provide skills needed for advanced manufacturing, such as digital skills and systems thinking.*

2.2.3. Expand and Disseminate New Learning Technologies and Practices: *At the secondary and postsecondary levels, implement hybrid courses that include advanced simulations, along with the use of cutting-edge equipment and methods used in advanced manufacturing. Expand upskilling and reskilling pathways for adults through learning technologies that reach more students and increase*

[43] Sector partnerships bring together key actors in the workforce system, including employers, training institutions, unions, and community organizations, to design jobs and training to address issues of recruitment, retention, career path – not just short-term placement; they are an evidence-based strategy that is a growing workforce investment priority across Administrations. https://www.aspeninstitute.org/programs/workforce-strategies-initiative/sector-strategies/

exposure and access to advanced manufacturing occupations. Support efforts to improve student access to high-speed internet.

Objective 2.3. Strengthen the Connections Between Employers and Educational Organizations

The imbalance between supply and demand for manufacturing workers can be addressed by building stronger relationships between employers and providers of training and education. Industry must clearly define its skill needs and support for solutions, while educational institutions must lead in developing the needed educational materials for quality credentialing and certification. On-the-job training and apprenticeships are important for skill development in manufacturing that require collaboration among industry, worker representatives, education providers, and government agencies.

The recommendations for this objective are:

2.3.1. Expand Work-Based Learning and Apprenticeships: *Expand high-quality, paid work-based learning and apprenticeships including internships, pre-apprenticeships, and registered apprenticeship. Promote platforms for workers to attain advanced manufacturing skills through ascending levels of earn-and-learn experiences. Connect advanced manufacturing employers to existing apprenticeship sponsors and apprenticeship partners.*

2.3.2. Promote Industry-Recognized Credentials and Certifications: *Encourage investment in modularized industry-recognized credentials and certifications for emerging manufacturing technologies. Encourage industry partnerships with educators to develop and update assessment methods. Track changing occupational requirements and define credentials for new advanced manufacturing occupations.*

Goal 3. Build Resilience into Manufacturing Supply Chains

The United States manufacturing supply chain is a complex ecosystem that connects raw material and component producers, logistics firms, integrators, and business support services. These interdependent entities design, produce, and assemble components and final products and the ecosystems they are part of create and benefit from product and process innovation. A key area for improvement is in supply chain and ecosystem resilience.

Resilience is the ability to recover from an unexpected shock and requires visibility, agility, and redundancy[44], which can be improved through better management and advanced digital modeling. Lack of digital infrastructure and transparency makes our supply chains vulnerable and unable to adapt when faced with shocks and stressors. Supply chain resilience will mitigate such risks through interdependent systems that can withstand a wide range of external shocks including geopolitical conflicts, cyberattacks, energy disruptions, financial crises, natural disasters, and pandemics.[45]

The *Executive Order on America's Supply Chains: A Year of Action and Progress*[46] directed Federal agencies to take concrete steps to increase supply chain resilience. Initial steps include mapping, monitoring, and analyzing supply chains to prepare for and respond to disruptions. However,

[44] https://www.whitehouse.gov/wp-content/uploads/2022/04/Chapter-6-new.pdf
[45] https://www.nist.gov/news-events/news/2022/04/nist-releases-study-blockchain-and-related-technologies-manufacturing
[46] https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/24/the-biden-harris-plan-to-revitalize-american-manufacturing-and-secure-critical-supply-chains-in-2022/

additional mapping and modeling of supply chain weaknesses is needed to support collective action across diverse public and private stakeholders and guarantee supply chain integrity.

Small- and medium-sized manufacturers (SMMs) comprise 98 percent of U.S. manufacturing firms and account for about half of the nation's manufacturing services and products. [47] They should be supported to increase resilience of manufacturing supply chains and ecosystems.

Three strategic objectives have been identified under Goal 3:

3.1. Enhance Supply Chain Interconnections
3.2. Expand Efforts to Reduce Manufacturing Supply Chain Vulnerabilities
3.3. Strengthen and Revitalize the Advanced Manufacturing Ecosystem

Objective 3.1. Enhance Supply Chain Interconnections

Strong collaborations between manufacturing firms can provide such benefits as reduced costs, increased innovation, and adaptability to supply chain disruptions[48]. However, extensive offshoring and outsourcing have resulted in weak collaborations and isolated industries. As a result, U.S. small manufacturers have fallen behind larger firms in terms of their technology investments, in part because of lead firms' singular focus on reduction of easily measured costs such as unit prices.[49] When SMMs lag in technology, their larger customers suffer as well. For example, slowness of suppliers in adopting additive manufacturing (AM) has created bottlenecks for aerospace and defense manufacturers in forging and casting supply chains; in some cases, parts have been delivered nearly a year after they were ordered.[50] Overall, labor productivity of the largest manufacturers is 58 percent higher than their middle-sized counterparts; a significant part of this gap is explained by lack of technology adoption among smaller firms.

The recommendations for this objective are:

3.1.1. Foster Collaboration within Supply Chains: *Promote public-private partnerships to improve technology adoption and environmental emissions reduction in manufacturing supply chains. Build trust and transparency between participants in supply chains.*

3.1.2. Advance Innovation for Digital Transformation of Supply Chains: *Work toward a vision of a digital supply chain highway (digital thread/digital twin) for critical sectors, from raw material to end-of-life and then recycling for reuse, to allow private and public sectors to use and analyze vertical and horizontal supply chains.*

Objective 3.2. Expand Efforts to Reduce Manufacturing Supply Chain Vulnerabilities

Supply chain resilience is a critical United States priority[51] with Federal and state agencies beginning to map, monitor, and analyze supply chains in critical sectors. These efforts include examining all aspects of a product's lifecycle, from the raw materials for manufacturing and distribution, through maintenance and repair, to final disposition. The resilience of America's supply chain is dependent on innovative manufacturing processes and advanced technologies. The global pandemic exposed the

[47] http://docs.house.gov/meetings/AP/AP02/20211026/114154/HHRG-117-AP02-Wstate-BonvillianW-20211026.pdf
[48] Chapter 6 of https://www.whitehouse.gov/cea/written-materials/2022/04/14/summary-of-the-2022-economic-report-of-the-president/
[49] https://obamawhitehouse.archives.gov/sites/default/files/docs/supply_chain_innovation_report_final.pdf
[50] https://www.whitehouse.gov/cea/written-materials/2022/05/09/using-additive-manufacturing-to-improve-supply-chain-resilience-and-bolster-small-and-mid-size-firms/
[51] https://www.whitehouse.gov/wp-content/uploads/2022/02/Capstone-Report-Biden.pdf

vulnerabilities across supply chains in multiple industries and underscored the urgent need to evaluate and adopt new technologies, continuously improve efficiency and effectiveness of logistics processes, reduce risk, and maintain a highly skilled supply chain workforce. Research must objectively evaluate existing frameworks and processes that define life-cycle cost and value, and develop and monitor supply chain metrics such as the value of resilience and cost of lead time.[52] Research in logistics and supply chain management that integrates government and private sector knowledge will result in stronger insights, trend analysis, and decision-management tools.

The recommendations for this objective are:

3.2.1. Trace Information and Products Along Supply Chains: *Develop universal awareness, common data sharing, improved reporting, and standardized cybersecurity integrations to help identify and quickly mitigate risks. Develop tools and practices to help larger supply chain partners, including the Federal government, flag vulnerabilities and improve cybersecurity measures.*

3.2.2. Increase Visibility into Supply Chains: *Develop and implement supply chain mapping strategies, digital tools, and standards that preserve privacy while improving supply chain visibility, particularly for firms and industries that provide inputs into many individual supply chains with large spillover effects. Such firms and industries include energy production, semiconductors, or transportation, as well as those important for national security, including climate and health security. Prioritize monitoring critical nodes using AI systems and economic analyses to provide advance notice of supply chain shocks and stressors.*

3.2.3. Improve Supply Chain Risk Management: *Improve risk management of external factors in supply chains through improved prediction of consequences of decisions made in uncertain environments. Ensure agility in the presence of pandemics and other low probability, high consequence events. Consider stress-testing supply chains against these events. Develop and diffuse techniques that help firms measure, value, and improve the resilience of their supply chains.*

3.2.4. Stimulate Supply Chain Agility**:** *Develop technology that supports manufacturing surge capacity and lead-time reduction during supply chain shocks and stressors. Establish and implement best practices in advanced processes and workforce training to promote collaboration among lead firms and suppliers.*

Objective 3.3. Strengthen and Revitalize Advanced Manufacturing Ecosystems

Advanced manufacturing ecosystems comprise a rich tapestry of manufacturing enterprises of all types and sizes. All play important roles in the process of innovation that leads to new products, new processes, new business models, and the creation of new markets. The Biden-Harris Administration's plans to advance the technological leadership of both small and large manufacturers[53] will promote disruptive innovations, leading to the creation and development of new markets. Young or small companies frequently face challenges in scaling from prototype to commercial practice. Government agencies at the state and Federal levels must be attuned to these challenges and support them through efforts that incorporate "Made in America by All of America's Workers."[54] Services such as the DOC-

[52] See for example https://acetool.commerce.gov/; https://onlinelibrary.wiley.com/doi/full/10.1002/joom.1113

[53] https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/24/the-biden-harris-plan-to-revitalize-american-manufacturing-and-secure-critical-supply-chains-in-2022/

[54] https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/25/executive-order-on-ensuring-the-future-is-made-in-all-of-america-by-all-of-americas-workers/

sponsored Hollings Manufacturing Extension Partnership technology-driven market intelligence[55] can help companies identify customers and markets for products and services based on their technology assets.

Public-private collaboration across the full spectrum of technology, workforce, and economic development is essential to strengthening and safeguarding America's advanced manufacturing supply chains and contributes to the power of regional innovation ecosystems to drive economic development. Economic development programs should help cluster initiatives to form around assets in a particular sector and successfully establish a manufacturing ecosystem. Collaboratives for advanced manufacturing innovation should focus on dissemination, adoption, and commercialization of advanced manufacturing technologies. These various partnerships must be interconnected and further strengthened through evaluation tools and methods to counter supply chain fragility. The United States needs to build and enhance these types of consortia to maintain global leadership in advanced manufacturing.

The recommendations for this objective are:

3.3.1. Promote New Business Formation and Growth: *Prioritize programs that provide key support for new manufacturing business formation and growth, including entrepreneurial training, mentoring for scientists and engineers, and long-term tracking of business growth and impact.*

3.3.2. **Support Small and Medium-Sized Manufacturers:** *Assist and incentivize SMMs to adopt advanced manufacturing technologies and contribute to the development of upskilling training. Ensure that SMMs are supported broadly by Federal programs and institutions to foster understanding and commitment to advanced manufacturing.*

3.3.3. Assist Technology Transition: *Coordinate across agencies and between Federal technology transfer-related policy groups to identify technologies across all communities and institutions suitable for transition from laboratory to market. Prioritize funding for research into measurement science and standards development to increase the sustainable transition of R&D to manufacturing.*

3.3.4. Build and Strengthen Regional Manufacturing Networks: *Create regional collaboratives that strengthen links between technology and workforce development for regional economic advancement. Strategically assist in developing multi-sector and multi-jurisdictional planning, leadership, technical, and professional expertise to sustain and grow regional manufacturing networks.*

3.3.5. ***Improve Public-Private Partnerships:*** *Support existing and new public private partnerships for development of advanced manufacturing technologies in tandem with workforce education. Continue to use Federal convening powers to ensure that relevant parties, particularly SMMs and underserved communities, are fully engaged. Seek greater alignment and accessibility of Federal grant programs for such collaborations.*

[55] https://www.nist.gov/mep/grow

Additional Interagency Contributors

Department of Agriculture
Sujata Emani
Kourtney Hollingsworth*
Michael Sussman

Department of Commerce
Nell Abernathy
Dwendolyn Chester
Alaa Elwany*
Lisa Fronczek
Nancy Gilbert
Joann Hill
Rob Ivester*
Al Jones
Mary Ann Pacelli
Clifton Ray*
Kelley Rogers
John Schiel
Dave Seiler
Don Ufford*
Zachary Valdez*
Jim Warren
Samm Webb

Department of Defense
Senthil Arul
Keith DeVries
Michael Parkyn*
John Yochelson*

Department of Energy
Ann Hampson
Pete Langlois
Jeremy Mehta*
Andrew Schwartz
Steve Shooter
Nebiat Solomon
Kelly Visconti

Department of Health and Human Services
Jay Kadakia
Anne Talley

Department of Labor
Jenn Smith

Environmental Protection Agency
Raymond Smith

Federal Aviation Administration
Cindy Ashforth
Robert Bouza

National Aeronautics and Space Administration
Vince Cappello
Susan Poland
Stephanie Yeldell

National Science Foundation
V. Celeste Carter
Georgia-Ann Klutke
Thomas Kuech
Elizabeth Mirowski
Andrew Wells

Small Business Administration
Amber Chaudhry

*Report Leadership

Appendix A. Agency Participation and Metrics

Potential contribution of Federal departments and agencies to the goals and objectives is listed in the Table below. All Federal activities listed in this Strategy are subject to budgetary constraints and other approvals, including the weighing of priorities and available resources by the Federal government in formulating its annual budget and by Congress in legislating appropriations.

Goals	Objectives	DOC	DOD	DOE	DOL	DOT	ED	EPA	HHS	NASA	NSF	USDA
Goal 1: Develop and Implement Advanced Manufacturing Technologies	1.1: Enable Clean and Sustainable Manufacturing to Support Decarbonization	●	●	●		●		●	●		●	●
	1.2: Accelerate Manufacturing for Microelectronics and Semiconductors	●	●	●							●	
	1.3: Leverage Advanced Manufacturing in Support of the Bioeconomy	●	●						●	●	●	●
	1.4: Develop Innovative Materials and Processing Technologies	●	●	●		●		●	●	●	●	●
	1.5: Lead the Future of Smart Manufacturing	●	●	●						●	●	●
Goal 2: Grow the Advanced Manufacturing Workforce	2.1: Expand and Diversify the Advanced Manufacturing Talent Pool	●	●	●	●		●		●	●	●	●
	2.2: Develop, Scale, and Promote Advanced Manufacturing Education and Training	●	●	●	●	●	●		●	●	●	●
	2.3: Strengthen the Connections Between Employers and Educational Organizations	●	●		●	●	●		●		●	●
Goal 3: Build Resiliency into Manufacturing Supply Chains	3.1: Enhance Supply Chain Interconnections	●	●	●					●	●	●	●
	3.2: Expand Efforts to Reduce Manufacturing Supply Chain Vulnerabilities	●	●	●		●		●	●	●	●	●
	3.3: Strengthen and Revitalize Advanced Manufacturing Ecosystems	●	●	●		●	●		●	●	●	●

Federal departments and agencies play key roles in fostering U.S. advanced manufacturing innovation. The goals, objectives, and recommendations outlined in this Plan were developed by the Federal departments and agencies with direct responsibility for or interest in advancing manufacturing innovations. State and local governments also provide key support for advanced manufacturing through partnerships and collective actions that bolster investments in research and development, education and workforce development, and resilient manufacturing supply chains and ecosystems.

To evaluate progress towards the proposed goals, objectives, and priorities, the suggested metrics are level of participation of departments and agencies and the development of new programs and projects based on the stated priorities.

Appendix B. Progress Made in Achieving the Objectives from the 2018 Strategic Plan

The National Science and Technology Council published a National Strategic Plan for Advanced Manufacturing in October 2018.[56] This section summarizes the progress made in the major goals and objectives defined in that plan. The 2018 strategic plan presented a vision for American global leadership in advanced manufacturing across industrial sectors to ensure national security and economic prosperity. This vision was to be achieved by pursuing three goals:

- Develop and transition new manufacturing technologies;
- Educate, train, and connect the manufacturing workforce; and
- Expand the capabilities of the domestic manufacturing supply chain.

Strategic objectives were identified for each goal, along with technical and program priorities with outcomes to be accomplished over four to five years. The suggested metrics for evaluating progress towards the 2018 goals and objectives were the level of participation of agencies and development of new programs and projects based on the stated priorities.

The table identifies Federal agencies that have contributed to the goals and objectives.

Goals	Objectives	DoD	DOE	DOC	HHS	NSF	NASA	DOL	USDA	ED
Manufacturing Technologies	Intelligent Manufacturing Systems	✓	✓	✓	✓	✓	✓			
	Materials and Processing Technologies	✓	✓	✓		✓	✓		✓	
	Medical Products Manufacturing	✓	✓	✓	✓	✓	✓			
	Electronics Design and Fabrication	✓	✓	✓		✓	✓			
	Food and Agricultural Manufacturing	✓	✓	✓	✓	✓			✓	
Manufacturing Workforce	Tomorrow's Manufacturing Workforce	✓	✓	✓		✓	✓	✓	✓	✓
	Career and Technical Education	✓	✓	✓		✓	✓	✓	✓	✓
	Industry-Recognized Credentials	✓		✓		✓	✓	✓	✓	✓
	Match Skilled Workers with Industries	✓	✓	✓			✓	✓	✓	
Domestic Supply Chain	Small and Medium-Sized Manufacturers	✓	✓	✓		✓	✓			
	Ecosystems for Manufacturing Innovation	✓	✓	✓		✓	✓			
	Defense Manufacturing Base	✓	✓	✓		✓	✓	✓		
	Advanced Manufacturing for Rural Communities			✓		✓		✓		

<u>Goal 1: Develop and transition new manufacturing technologies</u>.

The following strategic objectives were identified under this Goal:

1. Capture the future of intelligent manufacturing systems
2. Develop world-leading materials and processing technologies
3. Assure access to medical products through domestic manufacturing,
4. Maintain leadership in electronics design and fabrication
5. Strengthen opportunities for food and agricultural manufacturing

The Federal Government invests in a portfolio of manufacturing R&D activities within many agencies. The agencies coordinate efforts to avoid duplication, while ensuring that their investments meet mission needs and complement one another, where appropriate. The agencies participating in the

[56] https://www.manufacturing.gov/sites/default/files/2021-06/Advanced-Manufacturing-Strategic-Plan-2018.pdf

NSTC Subcommittee on Advanced Manufacturing have worked across administrations to coordinate and optimize Federal investments in advanced manufacturing R&D.

Federal Government programs have been successful in promoting technology development and transfer to manufacturing enterprises, especially those that are small- and medium-sized. These programs include Manufacturing USA institutes, NIST MEP, DOE's Manufacturing Demonstration Facilities and Embedded Entrepreneurship program, and NSF's Future Manufacturing Program. In addition, the SBIR/STTR programs in DOC, DoD, DOE, HHS, NASA, NSF, and EPA have provided entrepreneurial assistance for manufacturing R&D.

Examples of agency programs that have contributed to the progress in advanced manufacturing R&D are listed in the table below.

Agency	Technology Development Programs	
DOC	Manufacturing USA Manufacturing Extension Partnership Additive Manufacturing Robotics for Smart Manufacturing Advanced Materials Measurements Standard Reference Materials	AI in Manufacturing Biopharmaceutical Manufacturing Smart Manufacturing Systems Advanced Manufacturing Roadmaps Regional Innovation Hubs) Manufacturing USA National Emergency Assistance Program Rapid Assistance for Coronavirus Economic Response
DoD	Manufacturing Technology Programs Manufacturing USA institutes Defense Industrial Base Modernization	
DOE	Manufacturing USA Institutes Manufacturing Demonstration Facility Critical Materials Institute BOTTLE Consortium High Performance Computing for Manufacturing Lab-Embedded Entrepreneurship	Education and Workforce Roadmap (NREL) Robotics, High Performance Computing, and Energy Storage Internships Small Business Innovation Research and Small Business Technology Transfer programs American Made Challenges
HHS	Biomedical Advanced Research and Development Authority Centers for Innovation in Advanced Development and Manufacturing Division of Research, Innovation, and Ventures programs TechWatch Advancing Regulatory Science for Continuous Manufacturing	Regulatory Science and Innovation Grants Centers for Excellence in Regulatory Science Innovation Emerging Technology Team Advanced Technology Team
NASA	Game Changing Development Program Advanced Exploration Systems Program Technology Demonstration Missions Program	Space Technology Research Grants Programs Transformative Aeronautics Concepts Program

NSF	Cyber-Physical Systems Engineering Research Centers Future Manufacturing Program Industry/University Cooperative Research Centers	Advanced Manufacturing Program Foundational Research in Robotics Future of Work at the Human-Technology Frontier National Robotics Initiative 3.0
USDA	Science Theme Teams Small Business Innovation Research Forest Products Lab Pilot Plant Facilities	Bioeconomy, Bioenergy, and Bioproducts Program Intramural and Extramural Research Programs

Goal 2: Educate, train, and connect the manufacturing workforce.

The following strategic objectives were identified under this Goal:

1. Attract and grow tomorrow's manufacturing workforce
2. Update and expand career and technical education pathways
3. Promote apprenticeship and access to industry-recognized credentials
4. Match skilled workers with the industries that need them

Federal investments in education and workforce development are integral to building a diverse and skilled workforce of the future. While ED focuses on K-12 education and DOL on workforce development and certifications, other agencies, such as DoD, NASA, and NSF support STEM education and related workforce training and development programs that specifically benefit the manufacturing sector.

The Manufacturing USA institutes, in cooperation with MEP Centers, have also been active in education and workforce development. In FY 2021, educational and workforce programs across Manufacturing USA trained more than 90,000 people across the nation, helping to convince many to pursue careers in manufacturing. The DOL, under the Workforce Innovation and Opportunity Act (WIOA), has helped train displaced manufacturing workers and those who desired to enter the workforce. Many of the programs at the Manufacturing USA Institutes and DOL focused on training assistance to veterans. ED, under the Carl D. Perkins Career and Technical Education Act (Perkins V) has helped attract high school and community college students to manufacturing.

Examples of programs across agencies that have contributed to the progress in manufacturing education, training, and workforce development are listed in the table below.

Agency	Education and Workforce Development Programs	
DOC	Manufacturing USA Institutes, Education and Workforce Programs NIST Internship Program	MEP Workforce Development Programs NIST Summer Undergraduate Fellowship
DoD	Army Educational Outreach Program STARBASE Manufacturing USA Institutes, Education & Workforce Programs	Veterans To Energy Careers Manufacturing Engineering Education Program
ED	Carl D. Perkins Career and Technical Education Act	WIOA Title II, Adult Education and Family Literacy Act

Agency	Education and Workforce Development Programs	
DOE	Manufacturing USA institutes, Education and Workforce Programs Lab-Embedded Entrepreneurship Programs Better Plants Online Learning for Industrial Partners 500001 Ready Navigator Advanced Manufacturing Education and Workforce Roadmap Nuclear Relevant Scholarships and Fellowships	EERE High Performance Computing for Manufacturing Internship Program EERE Energy Storage Internship Program EERE Robotics Internships Program Nuclear Energy University Nuclear Leadership Program Office of Science Undergraduate Laboratory Internships Office of Science Community College Internships Office of Science Visiting Faculty Program Office of Science Graduate Student Research Program
DOE	Manufacturing USA Institutes, Education Workforce Programs Lab-Embedded Entrepreneurship Programs Better Plants Online Learning for Industrial Partners Ready Navigator	High Performance Computing for Manufacturing Internship Program Energy Storage Internship Program Robotics Internships Program
DOL	Apprenticeship Programs Trade Adjustment Assistance America's Promise Job Training Grants Strengthening Community Colleges Grants Growing Apprenticeships in Nanotechnology and Semiconductors	One Workforce Grants Scaling Apprenticeships Through Sector-Based Strategies Grants Apprenticeship: Closing the Skills Gap Grants
NASA	Faculty Fellowship Program STEM Engagement Programs	Established Program to Stimulate Competitive Research (EPSCoR) Minority University Research and Education Projects
NSF	Advanced Technological Education Program Training-Based Workforce Development for Advanced Cyberinfrastructure Engineering Research Centers Program Future Manufacturing Program Revolutionizing Engineering Departments Program	Broadening Participation in Computing and Engineering Programs Non-Academic Research Internships for Graduate Students (INTERN) Training-Based Workforce Development for Advanced Cyberinfrastructure
USDA	Academic Scholarships and Aides 4-H Science Program Partnerships with Universities Including MSIs and Community Colleges Cooperative Extension Network	Agriculture and Food Research Initiative (AFRI) Education and Workforce Development Grants

Goal 3: Expand the capabilities of the domestic manufacturing supply chain.

The following strategic objectives were identified under this Goal:

1. Increase the role of small and medium-sized manufacturers in advanced manufacturing
2. Encourage ecosystems of manufacturing innovation
3. Strengthen the defense manufacturing base
4. Strengthen advanced manufacturing for rural communities

The United States manufacturing supply chain is a complex system of large and small manufacturers, integrators, raw materials producers, logistics firms, and companies providing other support services (accounting, finance, legal counsel, etc.). These companies, many of them outside the United States, form interdependent networks that provide a wide variety of finished goods to the United States and global customers.

Examples of agency programs that have contributed to the domestic manufacturing supply chain and ecosystem are listed in the table below.

Agency	Supply Chain Programs	
DOC	Manufacturing USA Institutes MEP Centers Cybersecurity Supply Chain Risk Management Program Review of Semiconductor Manufacturing and Advanced Packaging	Advisory Committee on Supply Chain Competitiveness Office of Supply Chain, Professional and Business Services
DoD	Manufacturing USA institutes Industrial Base Programs	
DOE	Manufacturing USA Institutes Critical Materials Institute BOTTLE Consortium Manufacturing and Energy Supply Chain Office	
DOE	Manufacturing USA institutes Manufacturing Supply Chain Program	
NASA	Supply Chain Risk Management (SCRM) Program	
NSF	America's Seed Fund Convergence Accelerator Program Innovation Corps Operations Engineering Program	Partnerships for Innovation Pathways to Enable Open-Source Ecosystems Regional Innovation Engines
USDA	Storage Facility Loans Local Food Promotion Program Farmers Market Value-Added Producer Grants Regional Food System Partnership Dairy Business Innovation Initiatives Business & Industry Guaranteed Loan Program	Food Supply Chain Guaranteed Loan Program Meat and Poultry Inspection Readiness Grants Cooperative Extension Network

Agency	Supply Chain Programs	
EPA	Sustainable Materials Management Program	

Appendix C. Recommendations in Detail

Goal 1. Develop and Implement Advanced Manufacturing Technologies

Objective 1.1. Enable Clean and Sustainable Manufacturing to Support Decarbonization

Recommendation 1.1.1. Decarbonization of Manufacturing Processes: *Develop and demonstrate advanced manufacturing technologies that increase energy efficiency, electrify industrial processes, employ low-carbon feedstocks and energy sources in manufacturing, support new chemistries that avoid direct greenhouse gas emissions from industrial processes, capture and store industrial carbon dioxide, and create alternatives to GHG-intensive industrial products. Create and disseminate validation tools and processes to assist the integration of electrified and efficient technologies into manufacturing. Create transparency on advanced materials and processes with lower energy and carbon footprints.*

The availability of abundant, low-cost, clean electricity would enable drastic reductions in carbon dioxide and other emissions in manufacturing industries. Nearly 43 percent of all U.S. manufacturing emissions are from industrial process heating.[57] Many manufacturing processes require moderate to high process temperatures that are currently achieved by using fossil-derived fuels with high emissions. For some products, like cement and iron, carbon dioxide (CO_2) is released from chemical transformations that occur in standard processing, which is particularly difficult to abate. U.S. manufacturing plants can affordably reduce emissions by employing novel, electrified, and efficient advanced manufacturing processes that reduce energy consumption, have lower temperature requirements, and circumvent chemical transformations that release CO_2. For the CO_2 sources that are the most challenging to abate, carbon capture with either storage or utilization must be considered.

Replacing fossil-based thermal processes with innovative electrified heating technologies can cut emissions and provide productivity and competitiveness advantages. Novel electrochemical processes that enable chemical transformations to occur at much lower temperatures provide another opportunity to electrify industrial processes. Chemical reactions can be made more efficient through catalyst design, use of electrochemistry, or intensified process techniques. Significant energy improvements can also be gained by applying process intensification principles to mixing and separations, including combining multiple processes in a single unit. To abate CO_2 production inherent in iron and cement production, innovative approaches such as direct iron reduction and material replacement should be further developed. Reductions in the cost of hydrogen production and its integration into manufacturing processes as a fuel source are needed. Furthermore, advancements in carbon capture integration, efficiency, cost, and CO_2 storage and utilization can be employed to abate emissions from the manufacturing sector.

Recommendation 1.1.2. Clean Energy Manufacturing Technologies: *Improve materials, manufacturing processes and product designs for clean electricity generation and storage; zero-emission transportation, buildings, and industry to enable a decarbonized economy. Enhance the manufacturing of devices and materials that enable more efficient power conversion and transmission with advanced conducting materials, processing technologies and machine development. Manufacture advanced batteries with high energy densities and secure novel sustainable materials for low- and high-voltage applications.*

In pursuit of net-zero emissions by 2050, the United States is aiming to reach 100 percent carbon pollution-free electricity by 2035. The significant cost reduction of low-carbon, or “clean,” electricity

[57] https://www.energy.gov/sites/prod/files/2016/06/f32/QTR2015-6I-Process-Heating.pdf

has accelerated expanded use and accessibility of clean electricity worldwide, with 72 percent of new capacity coming from renewables.[58] Enabling highly emissive sectors such as transportation, construction, energy, and manufacturing to use low-cost clean electricity as an alternative to fossil fuel-based power and energy sources will require changes and upgrades to power generation and management.

Manufacturing advances that produce cost-competitive technologies for clean energy production, storage, and utilization domestically position the United States to lead the global energy transition. Innovations such as advanced composite materials for wind turbine blades and efficient power electronics for charging and grid integration are needed to meet growing demands driven by the electrification of multiple sectors. A major enabling technology needed to achieve this is economical battery production for grid-scale energy storage. Manufacturing process improvements are needed for increased energy densities enabled by next generation design and chemistries. A domestic supply chain that includes recycling should enable high-performance low-cost energy storage devices to power the nation's electrified energy and transportation sectors. Smart grids, comprised of advanced power electronics, high-speed connectivity, and phasor measurement units, balance power distribution based on energy production, storage, and consumption parameters. A reliable clean power supply depends upon technologies delivered through advanced manufacturing such as advanced battery production, efficient power storage and management, and grid utilization.

Recommendation 1.1.3. Sustainable Manufacturing and Recycling: *Develop economically viable manufacturing technologies that separate valuable materials from waste streams, as well as alternatives to energy- or pollution-intensive materials. Conduct R&D in the areas of sorting, purification, and deconstruction technologies. Scale up sustainable materials design and manufacturing, recycling and circular methods for multiple materials classes, and pilot programs and facilities. Improve data and methods to assess life cycle impacts and identify areas for improvement.*

Incorporating sustainable material management principles into product design and development reduces the amount of material and energy required to manufacture a product, which contributes to decarbonization. This includes the design and use of new materials that remain in use for longer durations, or that replace those with detrimental energy, health, and environmental impacts. Rather than exporting high-value waste streams, the development of a reuse and recycling infrastructure in the United States would simultaneously create domestically sourced raw materials and new jobs.

Circular manufacturing[59] minimizes the use of feedstocks and maximizes the reuse of processed materials and components. Advanced separation technologies are needed to efficiently process complex feedstocks and waste streams for co-production and recycling. Automated sorting and material detection technologies must be deployed at distributed collection and processing sites to address the existing bottlenecks for current recycling and reuse strategies. Following separation, advanced processing technologies must be leveraged to enable secondary and recycled materials to replace virgin materials with equivalent or better cost and performance. Designing products for material recovery, recycling, and reuse enables efficient use of materials and energy within the value chain, reducing the need to extract materials from the environment, and enabling a circular economy.

[58] https://www.irena.org/publications/2020/Jun/Renewable-Power-Costs-in-2019

[59] Circular manufacturing is a model of production which preserves resources, reduces waste, and involves sharing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible while creating value and new business opportunity.

As the second largest chemical-producing nation, the United States is an important enabler of the food, pharmaceutical, cleaning, and hygiene sectors. The chemical industry is also the largest energy consumer of the industrial sectors[60] with up to 85 percent of total production costs attributed to energy utilization.[61] Sustainable chemistry technologies that reduce or eliminate the use or generation of hazardous substances and increase energy efficiency will have the greatest impact in the industrial sector. Technology is needed to reduce water consumption and fouling in manufacturing processes and to efficiently process non-traditional water and wastewater resources to remove contaminants and obtain clean fit-for-purpose water.

Objective 1.2. Accelerate Manufacturing for Microelectronics and Semiconductors

Recommendation 1.2.1. Nanomanufacturing of Semiconductors and Electronics: *Invest in fabrication of integrated photonics, additive and direct printed electronics, unique sensor formats, and hybrid electronic fabrication to harness the power of nanomanufacturing. Develop physical, chemical, and biological methods to precisely place and bind atoms into desired molecules and structures.*

Microelectronics are dependent on a diverse global supply chain that has recently suffered resiliency challenges. Advanced microelectronic systems and components have seen many innovations over the past three decades, driven by the rapid advance of manufacturing technologies for new materials, design, and nanomanufacturing. As the design space moves towards three-dimensional circuits, manufacturing processes are moving to sub-nanometer resolutions enabled by the expansion of heterogeneous integration techniques. Microelectronics hardware design tools and atomically precise manufacturing and metrology processes are required to meet the increasing complexity and resolution of integrated circuits (ICs) and systems.

Advancing innovative microelectronics requires integration of novel pilot production and manufacturing scale-up capabilities. Innovations include photonic integrated circuits that offer rapid access to and transport of massive quantities of data, but the inflection point for this technology will only occur with foundry level production of full system solutions that include integrated lasers and detectors. Another example of innovation is atomically-precise manufacturing techniques that can enable processes that are sensitive to single atom dimensions, like quantum tunneling.

Recommendation 1.2.2. Semiconductor Materials, Design, and Fabrication: *Develop advanced manufacturing capabilities that allow the creation and testing of new devices, materials, and architectures. Provide easy access to design tools and microelectronics foundries for domestic companies and universities that provide fundamental insights and a trained workforce. Incorporate efficient and sustainable operations for microelectronics devices and components.*

While silicon will remain the primary platform for most microelectronic systems, other types of materials are needed for such applications as power, sensing, photonic, and quantum. Quantum sheets, wires, and dots are being considered to increase system performance via incorporation into digital frameworks that provide enhanced local functionality, such as optical communication. The integration of these materials requires new fabrication and process capabilities with improved means to transfer, locate with sub-micron precision, and interface with alternative and low-dimensional materials. To renovate the power grid, power electronics require new materials that complement the wide and ultra-wide bandgap materials that are in use today, such as silicon carbide and gallium nitride.

[60] https://www.eia.gov/energyexplained/use-of-energy/industry.php#:~:text=In percent202020 percent2C percent20the percent20industrial percent20sector,of percent20total percent20U.S. percent20energy percent20consumption
[61] https://www.energy.gov/sites/prod/files/2015/08/f26/chemical_bandwidth_report.pdf

Manufacturing components and devices from those materials will be driven by advances in processing and defect control that can be easily integrated into manufacturing infrastructure.

Long-term investments in the design and fabrication of quantum computing hardware are needed to maintain global leadership in the future of computing. Rapid developments and the technological promise of new quantum-based devices and systems require research and development of new manufacturing approaches appropriate for quantum devices, including economical and sustainable approaches to cool them to ultralow temperatures for optimal performance. Quantum computing, networking, and sensing rely on non-traditional devices made from materials as varied as superconductors and 2D topological insulators. These systems need extreme precision, reproducible processing, and defect control to realize their technical and commercial potentials.

Broad access to facilities for fabricating semiconductor systems from exotic materials, insulators, and biological cells is also needed to research, develop, and efficiently implement new computer architectures that will be used in future neural computers.

Recommendation 1.2.3. Semiconductor Packaging and Heterogeneous Design: *Introduce new materials, tools, designs, processes, assembly, and tests for advanced packaging with higher densities, yields, and reliability. Enhance R&D and prototyping to improve manufacturing throughput and reliability. Develop national facilities for heterogeneous packaging integration R&D.*

As data grows exponentially and downscaling of transistor density slows due to atomic limitations, chip designers are finding it more difficult to address the needs of high-performance computing, machine learning, and artificial intelligence. Similarly, the decreasing form-factor (or size) of mobile computing devices has elevated the importance of system and chip packaging. To meet the needs of increasingly complex and demanding computations, chip designers have identified heterogeneous integration, which places separately manufactured dies that perform different functions, such as logic, memory, and power management, into a single package that in aggregate provides higher performance, lower energy consumption, and lower cost.

Microelectronics manufacturing is increasingly reliant on advances in substrates, interconnects, chiplets[62], and interposers. Substrates protect and support the integrated circuit chip while providing thermal dissipation. The device, substrates, interconnects, dies, chiplets, and interposers must be co-designed and manufactured to provide optimal electronic, mechanical, thermal, and photonic functionalities. Finally, packaging quantum computing devices to integrate with more traditional computing devices must be considered in future semiconductors designs to achieve optimal performance and value.

Objective 1.3. Implement Advanced Manufacturing in Support of the Bioeconomy

Recommendation 1.3.1. Biomanufacturing: *Support research to advance biomanufacturing including genomic and protein engineering production tools, engineering of multicellular systems, biological models, and biotechnology methods for bioprocessing. Support advancement in multi-omics and bio-metrology for predictive modeling and bioprocessing analytical tools. Support enhancement of feedstock readiness, technical readiness, and manufacturing readiness level analytical tools. Prioritize implementation of safeguards to ensure that these products are not used for nefarious purposes.*

[62] A chiplet is a tiny integrated circuit (IC) that contains a well-defined subset of functionality.

The confluence of advances in biological and material sciences accelerated by developments in computing, data analytics, artificial intelligence, machine learning, genomic engineering, and synthetic biology has given rise to a wave of innovation in biomanufacturing. Biomanufacturing applications span many sectors including defense, space, agriculture and food, health and medicine, consumer products, and advanced materials and energy production. They offer potential solutions for such challenges as climate change, water scarcity, food and nutrition security, and infectious diseases in humans, animals, and plants. To ensure biosafety and biosecurity, these materials and technologies can be developed and deployed in ways that align with United States principles and values and international best practices, and not in ways that lead to accidental or deliberate harm to people, animals, or the environment, as outlined in the Executive Order on Biotechnology and Biomanufacturing.[63]

Biomanufacturing offers solutions including sustainable, on-demand, and concentrated production of critical and novel molecules and products, and hybrid mechanical/biological systems that combine the regenerative properties of biology with the structural strength and precision of traditional structures. Integration of biomanufacturing into a broader product portfolio would benefit from additional biological and genetic engineering, bioprocess design, and standardization of methods in biomanufacturing.

Recommendation 1.3.2. Agriculture, Forest, and Food Processing: *Support research in advanced genome sequencing, bioinformatics, predictive modeling for functional phenotypes, and integration of control systems and the teaming of humans and machines in food, feed, fuel, and fiber manufacturing. Develop sustainable energy low-cost water processing technologies including nutrient recovery systems that produce fit-for-purpose water from waste streams and unconventional sources.*

Incorporating advanced manufacturing technologies in agriculture, forest, food, and fiber industries can improve productivity, supply chain resiliency, and sustainability. New technologies are necessary to engineer greater production and resiliency for agriculture and food processing, aquatic production of food, and manufacturing of alternative protein products. Adoption of technologies that support distributed production and processing of food will enable not only development of new types of food and other related products but also enable equitable food distribution.

The application of digital thread technologies in food processing will support food traceability and safety in global food production from creation through consumption. Adoption of manufacturing techniques such as bio-fermentation to produce alternative proteins from single-cells, micro-algae production, cultivated and farmed feedstock, altered protein profiles in crops, and cultured tissue, meat, and seafood alternatives will promote diversified sources and improved food security.

Recommendation 1.3.3. Biomass Processing and Conversion: *Develop methods, processes, and technologies to tap into the one billion tons of biomass that could be sustainably produced in the U.S. and converted into feedstocks for manufacturing. Advance predictive process modeling, biological process analysis and genomic and protein engineering for desirable biomass feedstock pre-processing, processing, and deconstruction. Advance anaerobic treatment of bio-based waste streams to produce biogas, renewable natural gas, fertilizer, plant nutrients, soil amendments, biochar, engineered carbon, animal bedding material, surfactants, polymers, clean bioenergy, electricity, and combined heat/cooling power.*

[63] https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/12/executive-order-on-advancing-biotechnology-and-biomanufacturing-innovation-for-a-sustainable-safe-and-secure-american-bioeconomy/

Conversion of biomass is critical to the development of bioproducts including fuel and high value-consumer products. Continuous development of biobased processes and products for fuel, fiber, materials, and energy is dependent on developing new technologies that expedite the breakdown of biomass, such as lignin, for use in advanced materials. Processing and capturing the aromatic monomers that comprise lignin will enable more efficient biofuel and bioproduct production.

Advanced processing techniques can be enabled by using biomass that can be easily broken down as feedstock and by improving the effectiveness of deconstruction methods with new solvents. Technologies in genomic engineering, microbial processes, and chemical processes, such as recoverable ionic solvents, will be key to increasing the economic viability of commercial biomass conversion. These technologies will also enable newer products, such as cellulose nanomaterials as functional additives, nontoxic binders, packaging materials, and the development of new functional characteristics in bio-products needed to expand their use in unexplored chemical and additive markets.

Recommendation 1.3.4. Pharmaceuticals and Healthcare Products: *Advance continuous manufacturing, in-line process monitoring and control, integrated AI-assisted systems, and novel cell culture techniques. Prioritize developments in subtractive and additive machining and biobased manufacturing to create patient-specific medical products, devices, and biologically-driven drug delivery systems.*

Advanced manufacturing can be used to produce numerous new and improved healthcare products, including small molecule drugs, medical devices, biologics, vaccines, advanced therapies, and biocompatible materials. Biomedical manufacturing shares many cross-cutting technology challenges with other industry sectors, but there are unique challenges for specific medical applications. Manufacturing processes for each must ensure safety and efficacy, promote human and animal health, and minimize drug shortages, while also securing the United States global leadership in pandemic response and preparedness.

Technologies that will modernize production, intensify processes, and improve process control include smart manufacturing, continuous manufacturing, inline process monitoring and control, automated closed-loop systems, integrated AI-assisted systems, novel cell culture techniques, and higher yield alternative systems. Advances in machining, additive manufacturing, and biobased manufacturing can accelerate or augment capabilities for creating patient-specific medical products and devices, biologically-driven drug delivery systems, and implants that closely mimic natural properties. As the industry adopts these advanced manufacturing methods and produces novel products, simultaneous innovation will be required in the development of measurement tools to increase manufacturing efficiency and product performance. The continued evolution of medical products and device manufacturing will reduce operating costs and help rebuild a resilient domestic supply chain of biologic medicines, tissue products, machines, and biocompatible materials manufactured in the United States and by trusted allies and partners.

Objective 1.4. Develop Innovative Materials and Processing Technologies

Recommendation 1.4.1. High-Performance Materials Design and Processing: *Advance material design and processing capabilities through the integration of physics-based computational and data-driven machine learning tools. Accelerate testing, qualification and process validation of high-performance materials to streamline entry into market. Develop predictive capabilities for materials behavior and performance under harsh service conditions.*

Systems that impact personal and public safety or have profound national security or economic impact, such as nuclear reactors or hypersonic defense systems, typically involve operation under harsh service conditions such as extreme temperatures, pressures, chemicals and corrosive media, particulate loads, or radiation.[64] The development and adoption of lightweight, high strength, high conductivity, corrosion-resistant metals, composites, and other classes of advanced materials are important enablers for emerging manufacturing capabilities.

To develop sophisticated materials that meet the requirements of harsh service conditions, the United States must develop entirely new paradigms for alloys and other materials that leverage and, more importantly, integrate well-established physics-driven tools, integrated computational materials engineering, and data-driven machine learning. Computational methods development for high-performance material engineering and performance prediction are critical factors to reducing the cost and time to market for new applications. The United States Materials Genome Initiative[65] is developing the materials innovation infrastructure that will deliver new materials quickly at a fraction of existing costs and should be leveraged to develop the required high-performance materials.

Recommendation 1.4.2. Additive Manufacturing: *Develop additive manufacturing (AM) process optimization frameworks that are accessible to all users. Create new sensors to advance process monitoring and control capabilities. Develop machine learning algorithms to analyze large, secure, interoperable data streams and realize feedback control. Produce tools to create new AM-specific materials and capabilities. Integrate additive manufacturing technologies with smart manufacturing platforms.*

Advances in AM technologies have incorporated unique metallic alloys, integrated composite structures, and ceramic materials into complex high-performance goods that meet evolving demands. Expanding the role of additive and hybrid capabilities through dedicated R&D to address persisting challenges (such as lack of repeatability and predictability), as well as increasing their manufacturing/technology readiness level is crucial to enable their integration with established manufacturing technologies.

Although AM has already revolutionized prototype and low-volume production, further advances are needed to unlock the potential of parts fabricated with high-performance materials through improving performance modeling and analysis, in-process monitoring and control, and tailored post-process non-destructive evaluation, especially for high-consequence applications.[66] Several iconic U.S. manufacturers have come together to with the support of the Federal government to launch the AM Forward Initiative, which aims to improve the competitiveness of America's small-and-medium-sized manufacturers by helping them adopt AM.[67] The United States must continue to invest in and support advanced R&D to overcome key technological barriers that hinder the adoption of additive manufacturing.

Recommendation 1.4.3. Critical Materials: *Identify and integrate substitute materials and technologies to reduce or replace the use of critical materials in high-demand technologies. Develop advanced separation and processing methods for critical materials from primary, secondary, and unconventional*

[64] https://www.energy.gov/sites/default/files/2021-04/Materials for Harsh Environments_ 2020 Virtual Workshop Summary Report.pdf
[65] https://www.mgi.gov/sites/default/files/documents/MGI-2021-Strategic-Plan.pdf
[66] https://doi.org/10.6028/NIST.AMS.600-10
[67] https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/06/fact-sheet-biden-administration-celebrates-launch-of-am-forward-and-calls-on-congress-to-pass-bipartisan-innovation-act/

sources. Establish new design and manufacturing methods for components and products for reuse, recycling, remanufacturing, and repurposing of critical materials.

Critical materials[68] are the building blocks of technologies essential to energy, transportation, health, and defense industrial bases. Global demand for critical materials such as rare earth elements, lithium, cobalt, nickel and platinum group metals is expected to increase fourfold by 2040 to meet global decarbonization goals.[69]

Manufacturing innovation to expand midstream processing capabilities[70] and improved material and manufacturing efficiency will build resilient, diverse, and secure critical materials supply chains. Employing advanced manufacturing techniques can improve utilization of materials and reduce life-cycle impacts by minimizing or even eliminating waste streams.[71] Novel substitute materials and technologies should be identified and validated to reduce dependence on critical materials; and efficient separation processes can enable diversified supply of critical materials. Furthermore, efficient recycling and reuse can mitigate supply chain risk by establishing a circular economy and enabling a domestic supply of critical materials.

Recommendation 1.4.4. In-Space Manufacturing: *Develop new additive manufacturing processes in microgravity environments to create replacement parts and space infrastructure. Enable integration of robotics with in-space additive manufacturing processes for deep space exploration. Prioritize biomanufacturing investments in microgravity to enable extended space presence including sustainable food production, processing, and recycling, and the deactivation of hazardous materials.*

Since the beginning of the space age, all the resources or equipment needed for space missions have been manufactured on earth and shipped to space. Envisioning the need for future larger space infrastructure, in-space manufacturing (ISM) can provide technological superiority for improved capabilities to build space infrastructure, such as communications antennas, earth observations platforms, and solar power arrays. As articulated in the National Strategy for In-Space Servicing, Assembly, and Manufacturing,[72] ISM offers opportunities to enhance and accelerate United States leadership in space, by expanding the space-based economy and inspiring the next generation of students, innovators, and leaders. ISM can also enable the development of new and improved products for terrestrial applications using the unique microgravity environment of space, which can result in high-value products that are beneficial for life sciences, industrial materials, and sustainable development.

Efforts to further space mission capabilities include demonstrating AM technologies in microgravity for printing electronics and sensors, metal components for replacement and repair, and lunar regolith 3D-printing technologies for infrastructure. Other critical areas include developing biomanufacturing technologies for deep space exploration, which can advance the practicality of an integrated, multi-function, multi-organism biomanufacturing system to support extended missions in Mars-like conditions.

[68] https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals
[69] https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions
[70] The domestic midstream supply chain generally covers material processing and refinement, up to component manufacturing.
[71] https://www.gao.gov/products/gao-16-699
[72] https://www.whitehouse.gov/wp-content/uploads/2022/04/04-2022-ISAM-National-Strategy-Final.pdf

Objective 1.5. Lead the Future of Smart Manufacturing

Recommendation 1.5.1. Digital Manufacturing: *Enable the application of advanced sensing, control technologies, and machine learning across the manufacturing sector. Advance smart manufacturing by pursuing digital twins. Develop standards for data compatibility to enable seamless integration of smart manufacturing.*

Digital manufacturing involves the use of an integrated, computer-based system incorporating simulation, 3D visualization, analytics, and collaboration tools to create product and manufacturing process definitions simultaneously. Technology-based productivity improvements have consistently driven job growth by providing new tools that increase the productivity of factory floor workers. New scientific understanding and widespread high-speed computing and communications technologies now enable tremendous new productivity gains, but only if information technology can be integrated with operational technology.

The promise of digital manufacturing is guaranteeing high uptime and high-quality parts by monitoring and controlling every stage of the production process. While existing methods can be used to bring almost any manufacturing process under control, implementations are often expensive and time-consuming, lack generality, and are not fully dependable, limiting their application to the most expensive or highest volume products. New methods are needed to transition smart manufacturing from a collection of heroic demonstrations to routine and widespread use. The ultimate realization of smart manufacturing will result from the implementation of a digital twin, a computational model that reflects reality so precisely that it can accurately anticipate and avoid faults before they occur. Implementation of digital twins requires ubiquitous sensing of critical process parameters that will be facilitated by the production of low-cost, miniature, and accurate sensors, and process models that account for uncertainty.

Recommendation 1.5.2. Artificial Intelligence in Manufacturing: *Prioritize R&D in machine learning, data access, confidentiality, encryption, and risk assessment to enable the adoption of artificial intelligence in manufacturing. Develop best practices, standards, and software tools to scale new business models that monetize production data while maintaining data security and respecting intellectual property rights. Balance the interests of producers and consumers in areas such as privacy, intellectual property, and rights to repair.*[73]

Machine learning (ML) as a subset of artificial intelligence requires large datasets to deliver transformative capabilities. Provisioning such large-scale datasets for manufacturing applications may require access to production data across companies that critically depends on ensuring proprietary information is not compromised. With such assurances, machine learning has the potential to categorize the collective production experience of manufacturers across companies and provide individual manufacturers with low-cost solutions customized for their applications. That potential promises huge gains, as compared to the prevailing practice of developing local solutions on individual factory floors and protecting them as trade secrets. Such siloed development inevitably results in massive, economy-wide inefficiencies due to the costly reinvention of solutions that are routinely applied elsewhere.

[73] https://www.whitehouse.gov/briefing-room/presidential-actions/2021/07/09/executive-order-on-promoting-competition-in-the-american-economy/

The definition of key manufacturing problems and provision of datasets associated with those problems is foundational to enable the use of ML methods in manufacturing.[74]

Recommendation 1.5.3. Human-Centered Technology Adoption: *Promote the development of new technologies and standards that expand collaborative work between humans and machines by enabling safe and efficient human-machine interactions that augment human capabilities and empower production workers.*

The integration of process sensing and analytics with augmented/virtual/extended reality (AR/VR/XR), robotics, and human interaction improves manufacturing productivity by providing workers with continuous, real-time information to adapt activities to the parts they process and assemble.

Widespread adoption of AR/VR/XR in manufacturing requires a workforce trained to employ digital tools and improved software that reduces implementation cost. Human/machine collaborative tools and systems must provide safe human-machine interactions to enable cooperative work between humans and robots in close proximity. Because human co-workers are inherently unpredictable, new breakthroughs in artificial intelligence are needed to enable robots to anticipate human actions in all operations and ensure occupational safety and improved production efficiency. Use of such tools can enhance front-line worker skills rather than substitute for them.

Recommendation 1.5.4. Cybersecurity in Manufacturing*: Develop standards, tools, and testbeds, and disseminate guidelines for implementing cybersecurity in smart manufacturing systems. Focus efforts on updating the capital equipment of SMMs and replacing production equipment that cannot be made cybersecure. Provide purchasers a Software Bill of Materials for each product directly or by public release per President's Executive Order 14028 on Improving the Nation's Cybersecurity.*

Manufacturing companies typically maintain digital production and logistical plans which can become vulnerable to cyber-tampering or espionage. Stolen data can reveal intellectual property or be surreptitiously modified to introduce product defects, making cybersecurity a top priority for advanced manufacturing.[75] Cybersecurity in manufacturing organizations is complicated by the need to protect against vulnerabilities in both information technology (IT) and operational technology (OT) systems.

IT/OT concerns can often be addressed by conventional risk management techniques, such as data encryption, updating security patches, mapping data flows to identify vulnerabilities, restricting the access of personal devices to sensitive data, augmenting the security protocols of cloud providers, and using multifactor authentication. However, many manufacturers use legacy systems with well-known vulnerabilities that cannot be protected through simple software updates. New research efforts are needed to develop and/or update standards and guidelines[76] to implement emerging manufacturing cybersecurity technologies, including AI for threat detection and handling and distributed ledger technology to ensure the validity of sensitive manufacturing information and verification across supply chain networks.

[74] https://doi.org/10.6028/NIST.AMS.100-47

[75] https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/12/executive-order-on-improving-the-nations-cybersecurity/

[76] https://www.nist.gov/cyberframework

Goal 2. Grow the Advanced Manufacturing Workforce

Objective 2.1. Expand and Diversify the Advanced Manufacturing Talent Pool

Recommendation 2.1.1. Promote Awareness of Advanced Manufacturing Careers: *Promote awareness of advanced manufacturing careers with coordinated campaigns and events tailored to inspire students, with particular focus on people from backgrounds historically underrepresented in advanced manufacturing. Work with institutions and community leaders, and provide touchpoints with industry, particularly through hands-on experiences.*

Public perceptions often do not reflect the emerging career opportunities of the growing, technology-driven advanced manufacturing sector. Awareness is growing, but manufacturing is still widely assumed to be physically intense, dull and repetitive, and sometimes dangerous. Further, manufacturing jobs have developed a persistent and largely outdated reputation as low-skilled, poorly paid, and at-risk; however, these perceptions do not reflect the reality of career opportunities and benefits of the growing, technology-driven advanced manufacturing sector.

Coordinated messaging around the promise of advanced manufacturing can change the narrative from one of decline to opportunity. This effort is needed to capture interest, showcase clear pathways into the industry, and inspire a new generation to pursue rewarding careers.

To establish a narrative of opportunity, key messaging must dispel stigmas and reinforce pride and the social value of manufacturing careers. Effective campaigns will highlight relatable role models, illustrate the value proposition of career and technical education, and underscore the pivotal role of advanced manufacturing in meeting national challenges such as climate change, global economic competition, and national security.

Messaging campaigns should work together with existing events, including Manufacturing Day, and bring together industry and academic institutions to inform students through real-world experiences, media campaigns, and other STEM exposure opportunities.

In cases where the negative image fits the reality, the United States should seek to improve the reality. Implementation of the recommendations in this report, especially around training, will greatly help. In addition, while advanced manufacturing will require skill enhancements, in many cases, unfilled jobs reflect a "wage shortage" rather than a "skill shortage."[77]

Recommendation 2.1.2. Engage Underrepresented Communities: *Institutionalize industry-led capacity-building partnerships that work with community colleges and area high schools to engage students and families from backgrounds underrepresented in advanced manufacturing and in underserved communities, particularly those transitioning from fossil-fuel based industries. Actively engage colleges and universities, with a focus on minority-serving institutions. Clearly define shared goals, strategies, and resources among partners, including unions and community representatives. Implement industry-wide technical assistance, support services, and mentorship for people from underserved communities.*

Messaging will translate into action only if job quality improves and underserved communities and the organizations that represent them are proactively and consistently engaged.

Federal agencies can accelerate change by forging relationships between industry and two- and four-year colleges, with special focus on minority serving institutions, community-based organizations,

[77] https://www.forbes.com/sites/ethankarp/2021/03/02/the-case-for-raising-wages-in-manufacturing/?sh=76ed781b5480

professional societies, industry associations, labor union and joint labor-management organizations, and economic/social development agencies at local, regional, and state levels.

To engage underserved communities effectively, multiple avenues must be explored and pursued. These include increasing the flow of information about advanced manufacturing opportunities; improving the cultural relevance of curricula; increasing the use of near-peer role models and mentorship; and leveraging the influence of respected community institutions and thought leaders.

Recommendation 2.1.3. Address Social and Structural Barriers for Underserved Groups: *Ensure that Federal programs drive towards diversity, equity, inclusion and accessibility by establishing standards, policies, related metrics, evaluations, and accountability. Require inclusion plans for Federally-sponsored grants to ensure opportunities for veterans and people from backgrounds historically underrepresented and underserved communities in advanced manufacturing.*

The United States has a long history of social and structural barriers to entry and advancement in STEM occupations, such as advanced manufacturing. These barriers affect many communities, including women, racial and ethnic minorities, the disabled, and veterans. A 2021 Federal interagency report describes a wide range of barriers that have resulted in underrepresentation by these groups in technical careers. [78] These barriers include policies, workplace climate, cost of education, biases, inadequate support, stereotypes, institutional cultural resistance to change, experience requirements, language and cultural challenges, and lack of human capital resources.

Overcoming these barriers requires an honest and thorough review of the challenges faced by affected communities, followed by comprehensive and resolute action. Sustained efforts will not only expand the talent pool for entry-level workers but will help incumbent and dislocated workers with adjacent skills move into the advanced manufacturing workforce. Essential steps include the reassessment of selection/advancement metrics; the development of more diverse manufacturing workforce leadership teams; targeted work-based learning initiatives; the provision of support services including transportation and childcare assistance; and recognizing, empowering, and effectively utilizing the diversity already present within the advanced manufacturing workforce.

Lasting change requires sustained resources as well as a commitment to monitor progress. Federal agencies can accelerate progress by making diversity, equity, inclusion, and accessibility planning an integral part of funding proposals and evaluation criteria for awards.

Objective 2.2. Develop, Scale, and Promote Advanced Manufacturing Education and Training

Recommendation 2.2.1. Incorporate Advanced Manufacturing into Foundational STEM Education: *Extend the elementary and secondary STEM improvement agenda to incorporate key concepts, foundational knowledge, and skills for advanced manufacturing technologies. Raise awareness for multiple career pathways and enhance industry engagement to provide students with hands-on training opportunities. Support technical education and STEM programs with a stronger focus on engineering and technology. Prepare teachers to lead exciting, learning-intensive student projects that integrate advanced manufacturing concepts and careers.*

Like other STEM-intensive industries, advanced manufacturing depends on a robust STEM workforce and education system. The CO-STEM Federal Education Strategic Plan outlines priority approaches for

[78] https://www.whitehouse.gov/wp-content/uploads/2021/09/091621-Best-Practices-for-Diversity-Inclusion-in-STEM.pdf

improving the STEM education pipeline.[79] However, advanced manufacturing technology and career awareness do not figure prominently as objectives, nor are they featured in popular STEM programs and competitions. Thus, there is an enormous opportunity to enhance these programs by incorporating advanced manufacturing technology and career awareness. Furthermore, this addition has the potential to expand the STEM workforce by inspiring and attracting students into new and diverse educational pathways.

Students should be exposed to the interdisciplinary nature of advanced manufacturing through touchpoints with industry and project-based learning. Competitions in robotics and other disciplines motivate students and provide first-hand experience of the interdisciplinary nature of practical technology and engineering applications. Maker education fosters creativity and contextualizes learning of mechanical, electrical, and computer science skills through multidisciplinary experiences.[80]

Professional development can teach educators how to better integrate manufacturing skills development with adjacent STEM subjects. The ASM International Materials Camps for teachers, which show teachers how to demonstrate engineering concepts in the classroom, provides one of several promising models.[81]

Recommendation 2.2.2. Modernize Career Technical Education (CTE) for Advanced Manufacturing: *Modernize and scale CTE through grants and industry-based efforts that strengthen teaching and learning to improve student engagement and outcomes and inspire student interest in manufacturing careers. Prepare teachers and postsecondary faculty to teach courses that deliver both academic knowledge and skills for advanced manufacturing using updated instructional methods. Support student competition opportunities that provide skills needed for advanced manufacturing, such as digital skills and systems thinking.*

CTE courses and pathways need updating to inform and inspire students to consider careers in advanced manufacturing. CTE educators often face challenges, such as a shortage of up-to-date equipment to support their programs or insufficient resources to stay abreast of the latest manufacturing technologies. Successful approaches include integrating leading technologies and effective strategies for engaging students, engaging business and industry as partners in co-designing CTE programs of study and offering work-based learning opportunities to ensure the knowledge, skills, and credentials students earn will prepare them to succeed in the workforce. Overall, secondary and post-secondary CTE programs remain widely undervalued and under-resourced relative to their importance to the future of the United States economy.

Greater investments to address this gap should begin in middle school, where showcasing cutting-edge technologies and careers can introduce students to a range of technical career pathways. Building on this foundation, essential investments in high school CTE career pathways include concurrent or dual enrollment opportunities between colleges/universities and secondary schools, work-based learning opportunities, and the opportunity to earn industry-recognized credentials alongside academic coursework. At the postsecondary level, two-year colleges provide the institutional gateways to a variety of advanced manufacturing careers, as well as opportunities to develop stackable credential

[79] https://www.whitehouse.gov/wp-content/uploads/2022/01/2021-CoSTEM-Progress-Report-OSTP.pdf

[80] Novel approaches such as entrepreneurship-based learning give students relevant context as they work on projects in cross-functional teams.

[81] https://www.asmfoundation.org/teachers/materials-camps/

and connected degree models that help people to enter and advance in the field. Digital skills warrant particular emphasis as smart and digital manufacturing systems become more prevalent.

Teachers and postsecondary faculty need preparation to deliver curricula using leading-edge pedagogies and learning technologies. Competitions, such as those in robotics, deliver value by engaging students and providing academic and skill-oriented experiences.

Recommendation 2.2.3. Expand and Disseminate New Learning Technologies and Practices: *At the secondary and postsecondary levels, implement hybrid courses that include advanced simulations, along with the use of cutting-edge equipment and methods used in advanced manufacturing. Expand upskilling and reskilling pathways for adults through learning technologies that reach more students and increase exposure and access to advanced manufacturing occupations. Support efforts to improve student access to high-speed internet.*

The disruption of in-person education and training caused by the COVID-19 pandemic accelerated the development, proliferation, and acceptance of transformative learning tools and distribution systems. The blended learning model —mixing online and in-person instruction—has proven to be particularly effective and scalable in the context of technical learning.[82] Hybrid learning uses asynchronous learning modules for students to develop conceptual knowledge and baseline skills specific to manufacturing equipment. Game-based-learning and virtual reality simulations have immense potential to enhance these distance and blended learning models. Enriched distance and blended learning models expand the reach of an instructor to a larger student body while offering support specialization and time-sharing models for scarce and costly equipment and instructors.

The modularization of coursework and competency-based assessment can help workers transition to new occupations through reskilling and continuous learning throughout their careers. Initiatives such as "Internet For All" also enable the delivery of educational content to underserved communities.[83]

Objective 2.3. Strengthen the Connections Between Employers and Educational Organizations

Recommendation 2.3.1. Expand Work-Based Learning and Registered Apprenticeships: *Encourage investment in modularized industry-recognized credentials and certifications for emerging manufacturing technologies. Encourage industry partnerships with educators to develop and update assessment methods. Track changing occupational requirements and define credentials for new advanced manufacturing occupations.*

Skills in the advanced manufacturing sector can be best attained via conceptual learning coupled with practical workplace experiences. Apprenticeship programs provide a widely-recognized framework for combining earning and learning, while benefiting all students, especially those from low-income communities.

The gold standard for work-based learning is the Registered Apprenticeship, an industry-driven pathway in which individuals obtain work experience, mentorship, classroom instruction, progressive wage increases, and a portable, nationally recognized credential.

[82] https://olj.onlinelearningconsortium.org/index.php/olj/article/viewFile/1726/558
[83] https://www.commerce.gov/news/press-releases/2022/05/biden-harris-administration-launches-45-billion-internet-all-initiative

Many employers, however, find it challenging to meet all of the requirements of a fully recognized Registered Apprenticeship. Small and mid-sized enterprises are particularly challenged to provide the resources to support work-based learning models. As a result, insufficient apprenticeship and work-based learning opportunities exist in advanced manufacturing relative to the need.

This supply-side bottleneck must be cleared. One remedy is the expansion and integration of work-based learning programs within secondary and postsecondary CTE programs. Work-based learning can also be offered through internships and cooperative learning programs that provide academic credit at post-secondary institutions, and through high school pre-apprenticeship programs.

Recommendation 2.3.2. Establish Industry-Recognized Credentials and Certifications: *Expand high-quality paid work-based learning and apprenticeships including internships, pre-apprenticeships, and registered apprenticeship. Promote platforms for workers to attain advanced manufacturing skills through ascending levels of earn-and-learn experiences. Connect advanced manufacturing employers to existing apprenticeship sponsors and apprenticeship partners.*

Educational programs cannot effectively interact with emerging technologies without a continuously evolving system of credentials. Such credentials give earning power to workers, planning indicators to employers, and clear investment signals to the education and training community. While legacy manufacturing skills are already defined by the Manufacturing Skills Standards Council[84], definition of additional competencies is needed in advanced manufacturing.

The current array of credentials is too numerous, overlapping, and not universally grounded in competencies. Future credentials must be industry-led, competency-based, and nationally portable. Well-designed credentials can create substantial economic value by allowing industry to identify the latest knowledge, skills, and abilities of value in the labor market. Such credentials allow education and training providers to tailor their programs of study and enable graduates to effectively convey their competency to employers.

To realize the potential of improved credentials, college, and K-12 programs must upgrade student assessments, grant credit for prior training, and design competency-based evaluations. Employers and the training community can add additional value by rigorously developing and disseminating micro-credentials and digital badging[85] to supplement basic credentials. As new production technologies develop, educators and industry experts must efficiently work together to establish new occupational requirements.[86]

Goal 3. Build Resilience Into Manufacturing Supply Chains

Objective 3.1. Enhance Supply Chain Interconnections

Recommendation 3.1.1. Foster Coordination within Supply Chains: *Promote public-private partnerships to improve technology adoption and environmental emissions reduction in manufacturing supply chains. Build trust and transparency among participants in supply chains.*

Major innovations in decentralized supply chains can suffer from a dilemma: upstream firms will not supply something until they see a demand for it, but downstream firms will not invest in products

[84] https://www.msscusa.org/

[85] Digital Badging is a digital representation of a skill, learning achievement or experience.

[86] The Department of Labor has established the site https://www.apprenticeship.gov/ to provide resources and technical assistance to jobseekers, employers, and educators.

requiring that input unless there is a ready supply (as in the cases of additive manufacturing or the electric vehicle supply chain). Similarly, improved coordination could help with greening the supply chain, by identifying common opportunities to reduce emissions and use of hazardous materials. Excess waste is created when a supplier does not adequately understand what the customer is doing with the product or cannot effectively distinguish between activities that add value versus those that result in waste.

The SEMATECH[87] partnership is one example of a public-private partnership that addressed these issues by coordinating demand and supply of semiconductor equipment. The EPA's E3: Economy - Energy – Environment program[88], is a second example of a public-private partnership that brought together suppliers and customers to identify ways to reduce emissions. The new AM Forward initiative[89] for additive manufacturing is a third success story illustrating how public-private partnerships address these issues.

Recommendation 3.1.2. Advance Innovation for Digital Transformation of Supply Chains: *Work toward a vision of a digital supply chain highway (digital thread/digital twin) for critical sectors, from raw material to end-of-life and then recycling for reuse, to allow private and public sectors to use and analyze vertical and horizontal supply chains.*

By replicating physical operations in virtual space, firms in supply chains can share information to rapidly convert designs and raw materials into products. Digitizing the supply chain will improve efficiency, increase return on investment, and enable clean and sustainable manufacturing.

Achieving the digital transformation requires technical innovation in several key areas: robust industrial internet of things; artificial intelligence and machine learning algorithms; robotics that can be applied across a broad range of manufacturing processes; radio frequency identification; and machine tools and controllers that can plug-and-play in an integrated, information-centric system. The United States must expand ongoing R&D efforts to represent, structure, communicate, store, standardize, and secure product, process, and logistical information in a digital manufacturing environment.

Objective 3.2. Expand Efforts to Reduce Manufacturing Supply Chain Vulnerabilities

Recommendation 3.2.1. Trace Information and Products Along Supply Chains: *Develop universal awareness, common data sharing, improved reporting, and standardized cybersecurity integrations to help identify and quickly mitigate risks. Develop tools and practices to help larger supply chain partners, including the Federal government, flag vulnerabilities and improve cybersecurity measures.*

Visibility into supply chain relationships is necessary to identify vulnerabilities for firms to adequately plan and manage risks for disruptive events.[90] Gaining this knowledge requires both improved technology and improved trust between buyer and supplier.[91] Most major manufacturers lack insight into the supply chains on which they depend, particularly for relationships more than two layers deep. They also lack insight into interdependencies among products that rely on the same, or similar, components that may have limited domestic or global production capacity. Proprietary interests of

[87] https://www.darpa.mil/about-us/timeline/sematech
[88] https://www.epa.gov/e3
[89] https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/06/fact-sheet-biden-administration-celebrates-launch-of-am-forward-and-calls-on-congress-to-pass-bipartisan-innovation-act/
[90] https://www.mckinsey.com/business-functions/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains
[91] https://mackinstitute.wharton.upenn.edu/2021/building-supply-chain-continuity-capabilities-for-a-post-pandemic-world/

suppliers' limit access to information that manufacturers need to effectively manage supply and for the suppliers to effectively manage production planning. Lack of information is frequently due to lack of trust between original equipment manufacturers (OEMs) and suppliers; addressing this issue is necessary before a digital transformation can occur.

Improved traceability of information and products will enable better decision-making, limit supply chain risks for key products, and strengthen adaptability in the event of shocks and stressors. Transparency in supply chains promotes awareness of risks, identifies bottlenecks, and helps organizations determine whether alternative sources of critical inputs are needed. Transparency also empowers consumers to make informed purchasing decisions and businesses to better manage their suppliers and serve their customers.

Recommendation 3.2.2. Increase Visibility into Supply Chains: *Develop and implement supply chain mapping strategies, digital tools, and standards that preserve privacy while improving supply chain visibility, particularly for firms and industries that provide inputs into many individual supply chains with large spillover effects. Targeted industries should include energy production, semiconductors, and transportation, as well as other important for national security, including climate and health security. Prioritize monitoring critical nodes using AI systems and economic analyses to provide advance notice of supply chain shocks and stressors.*

The complex and vast ecosystem of global manufacturing supply chains has not been fully mapped and shared among stakeholders domestically or abroad. The numerous suppliers, data systems, and hidden interdependencies involved make it very difficult to accurately depict a manufacturing company's entire supply network. As a result, major supply chain disruptions often lead to widespread loss of revenue and failure to produce critical goods. Visibility into supply chains via supply chain mapping and analysis would address this weakness by enabling detection of supply chain threats and vulnerabilities, mitigating risks, and creating opportunities for performance growth.

To ensure resilience and market security for public good, the Federal government should collaborate with industry partners and like-minded allies to identify firm-to-firm network structures and create maps of supply chains for critical industries. Sector-to-sector connections (but not firm-to-firm connections) can be illustrated using disaggregated, publicly available data from the Bureau of Economic Analysis's Input-Output Accounts Data.[92,93] Supply chain mapping can be enhanced with monitoring of critical nodes. For example, the HHS Supply Chain Control Tower[94] has provided demand signals for personal protective equipment (PPE) that was critical during the COVID-19 pandemic. The daily-updated platform delivered visibility on PPE inventory levels, manufacturer capacity, distribution flows, and point-of-care consumption to inform decision-making preparedness and response. Federal economic and market tools can also be used to strengthen manufacturing capability to meet demand and respond to supply chain challenges.[95,96] Using these tools can enable daily or regular decisions about each manufacturing unit operation, sustainable production rates, short- and long-term strategic investments, and forward-looking plans to introduce new high-tech products into the marketplace. The benefit of increased visibility into sector-to-sector and cross-border connections in supply chains must be balanced against the benefit of privacy for individual firms and firm-to-firm connections.

[92] https://www.bea.gov/industry/input-output-accounts-data
[93] https://www.whitehouse.gov/cea/written-materials/2022/04/14/summary-of-the-2022-economic-report-of-the-president/Chapter-6
[94] https://aspr.hhs.gov/AboutASPR/ProgramOffices/ICC/Pages/IM-Division.aspx
[95] https://www.usda.gov/oce
[96] https://www.ams.usda.gov/

Recommendation 3.2.3. Improve Supply Chain Risk Management: *Improve risk management of external factors in supply chains through improved prediction of consequences of decisions made in uncertain environments. Ensure agility in the presence of pandemics and other low probability, high consequence events. Consider stress-testing supply chains against these events. Develop and diffuse techniques that help firms measure, value, and improve the resilience of their supply chains.*

Lack of information today limits the ability of entities across the supply chain to make informed decisions on topics such as reliably sourcing raw materials and parts, effectively utilizing and expanding production capacity, determining costs and prices, and preparing for and responding to unanticipated disruptions. Short-term and long-term dislocation of supply and demand results in shortages and significant price increases for critical products. Moreover, lack of information and transparency can result in substandard, counterfeit, and illicitly sourced products, materials, and equipment entering the supply chain undetected, with serious consequences. To better manage risk and increase resilience, firms need better information along with better systems and tools to use information so they can best manage risk of disturbances and complex global relationships.

To address these vulnerabilities and improve supply chain decision-making at all levels, technology hubs and industrial clusters should be expanded and better connected so that they can effectively utilize common information platforms and market intelligence. Federal agencies are uniquely positioned to organize, mobilize, and communicate strategic intelligence to provide early warning to the nation's supply chain about prospective cyberthreats, supply chain shocks, and geopolitical risks. Manufacturing entities must also use shared knowledge to improve resilience to the effects of climate change and understand the effects of increasing weather disturbances, coastal and inland flooding, wildfires, and more on their suppliers, customers, and distribution networks. Manufacturers must ensure economic flexibility in the presence of pandemics and other low probability, high consequence events and should consider stress-testing their supply chains against these events. Adoption of agile practices like these often enhances cost competitiveness and resilience of firms, because investing in problem-solving capabilities that reduce downtime will improve performance in steady times as well as in emergencies.

Recommendation 3.2.4. Stimulate Supply Chain Agility**:** *Develop technology that supports manufacturing surge capacity and lead-time reduction during supply chain shocks and stressors. Establish and implement best practices in advanced processes and workforce training to promote collaboration among lead firms and suppliers.*

Digital transformation can render supply chains far more responsive and resilient. The challenge in achieving the vision is not just technical, but also organizational and economic: suppliers and their workers must have incentives and capabilities to adopt such technically demanding processes.

If firms invest in their workers' ability to solve problems, they will be able to pivot quickly to alternative products or processes or react to unusual situations. Resilient and flexible companies and workers will identify an alternative raw material to replace one that is unavailable, incorporate a process very different from what has traditionally been standard, or increase the flexibility of the production process so that the firm can use a less-specialized input.

Agility may require upfront investment by firms in a supply chain, but over time can reduce costs and enhance efficiency. Investing in problem-solving capability that reduces lead time can improve performance in normal times as well as in emergencies. These agile manufacturing processes, and the associated workforce training, must be effectively distributed throughout the supply chain to promote

more effective collaboration and connectivity among firms. If successfully implemented, these processes can significantly improve the competitiveness of the United States manufacturing sector.

Objective 3.3. Strengthen and Revitalize Advanced Manufacturing Ecosystems

Recommendation 3.3.1. Promote New Business Formation and Growth: *Prioritize programs that provide key support for new manufacturing business formation and growth, including entrepreneurial training, mentoring for scientists and engineers, and long-term tracking of business growth and impact.*

Breakthrough technologies typically take a long time to find their way to market. Federal programs aimed to assist small businesses navigate these periods of uncertainty. Such programs are particularly important in manufacturing, where private capital finds risk-reward tradeoffs unattractive. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs provide capital to small companies with new ideas. SBIR and STTR and other complementary programs are intrinsic to many government agencies.[97]

The NSF Innovation Corps (I-Corps™) Program provides intensive training in the market discovery required to move new discoveries toward commercialization.[98] Many other agencies have adopted the I-Corps model to establish similar programs focused on translational research, so that agency-supported research can be commercialized as products or services to benefit the public. The DoD Rapid Innovation Fund finances small businesses' mature technology ideas to transition into defense programs. The Mentor-Protégé Program partners small businesses with larger companies to receive business development support in several areas.[99] The SBA Small Business Development Centers provides business and technology assistance for start-ups and existing small businesses.[100]

Recommendation 3.3.2. Support Small and Medium-Sized Manufacturers: *Assist and incentivize SMMs to adopt advanced manufacturing technologies and contribute to the development of upskilling training. Ensure that SMMs are supported broadly by Federal programs and institutions to foster understanding and commitment to advanced manufacturing.*

Small and medium-sized manufacturers (SMMs) comprise 98 percent of U.S. manufacturing firms and account for about half of industrial output.[101] Individually, many SMMs face challenges in adopting advanced technologies and providing adequate training and compensation to their workers.[102] SMMs need Federal assistance to continue their significant contributions to the manufacturing ecosystem and participate in advanced manufacturing.

Government has a critical role to play in addressing the vulnerability of SMMs. Networks such as the Manufacturing USA Institutes—with members that include both industry and educational institutions convene education and training providers to meet the technology and training needs of SMMs. The DOC-sponsored Hollings Manufacturing Extension Partnership (MEP) provides more examples of how Federal programs can support SMMs. It is imperative to connect SMMs to sources of new technologies, technical infrastructure, and specialized knowledge through other companies, institutes of higher learning, Federal laboratories, Manufacturing USA institutes, and more. Education and training systems

[97] https://www.sbir.gov/sites/default/files/SBA_Final_FY19_SBIR_STTR_Annual_Report.pdf
[98] https://www.nsf.gov/news/special_reports/i-corps/
[99] https://www.sba.gov/federal-contracting/contracting-assistance-programs/sba-mentor-protege-program
[100] https://www.sba.gov/local-assistance/resource-partners/small-business-development-centers-sbdc
[101] http://docs.house.gov/meetings/AP/AP02/20211026/114154/HHRG-117-AP02-Wstate-BonvillianW-20211026.pdf
[102] https://mitpress.mit.edu/books/creating-good-jobs

are essential in delivering the programs necessary to upskill the workforce for advanced manufacturing.[103] SMMs also seek trusted advisors from local, state, and regional organizations for appropriate advice on possibilities of new technologies. Expanding SMM access to technologists from the Federal and state levels will further production and engineering functions critical to these firms.[104]

Recommendation 3.3.3. Assist Technology Transition: *Coordinate across agencies and among Federal technology transfer-related policy groups to identify technologies across all communities and institutions suitable for transition from laboratory to market. Prioritize funding for research into measurement science and standards development to increase the sustainable transition of R&D to manufacturing.*

The manufacturing sector must be able to rapidly adapt manufacturing capabilities that leverage R&D advances. Not unique to advanced manufacturing, this priority crosses all R&D areas supported by the Federal government. The critical role of technology transfer and the importance of facilitating the transition of technologies from the laboratory to the market is recognized in the President's Management Agenda as a Cross-Agency Priority (CAP) Goal.[105] Federal agencies are directed to ramp up coordination efforts through the Lab-to-Market CAP Goal to improve technology transfer via five strategies: (1) identify regulatory impediments and administrative improvements in Federal technology-transfer policies and practices; (2) increase engagement with private sector technology development experts and investors; (3) build a more entrepreneurial R&D workforce; (4) support innovative tools and services for technology transfer; and (5) improve understanding of global science and technology trends and benchmarks.[106]

To facilitate effective paths forward, Federal efforts should not only focus on the companies that are most likely to further develop and implement advanced manufacturing technologies, but also capitalize on capabilities in underrepresented communities and rural America. At the same time, advances in measurement science and standards cannot be overlooked since these are essential to support repeatability and widespread adoption of advanced manufacturing technology.

Recommendation 3.3.4. Build and Strengthen Regional Manufacturing Networks: *Support existing and new public private partnerships for development of advanced manufacturing technologies in tandem with workforce education. Continue to use Federal convening powers to ensure that relevant parties, particularly SMMs and underserved communities, are fully engaged. Seek greater alignment and accessibility of Federal grant programs for such collaborations.*

The U.S. manufacturing capacity is regionally clustered in both urban and rural settings across the country, providing ready access to suppliers, essential services, and workers to enhanced productivity and innovation[107]. The needs, assets, and opportunities within regions are different and should be addressed by businesses and government organizations active in those regions. This is the reason that the stakeholders in the Manufacturing USA institutes work closely with the economic, industrial, educational and community-based leadership of the regional ecosystems in which they are based and invest. Well-designed and operated public-private partnerships have pivotal contributions to make in strengthening advanced manufacturing ecosystems. Only public-private partnerships can attract and focus resources while providing frameworks to connect essential stakeholders including industry,

[103] https://www.commerce.senate.gov/services/files/0DAF8ACC-8382-4E85-BEBA-1F8B5F577922
[104] https://docs.house.gov/meetings/AP/AP02/20211026/114154/HHRG-117-AP02-Wstate-BonvillianW-20211026.pdf
[105] https://www.performance.gov/pma/
[106] https://www.nist.gov/news-events/news/2020/11/taking-innovation-lab-market
[107] https://www.sciencedirect.com/science/article/abs/pii/S0048733314001048

educational institutions, workforce investment boards, local and community-based organizations, and Federal and state agencies.

Federal agencies should leverage public-private networks to make their funding opportunities more easily accessible, particularly to SMMs and underrepresented communities. Federal agencies can strengthen regional advanced manufacturing supply chains by tightening linkages between technology and workforce development and making funding opportunities more easily accessible, particularly to SMMs and underrepresented communities Synergies between programs should be described, enabling networks to weave funding streams together in pursuit of larger goals. Federal agencies should make greater efforts to coordinate grant announcements with evaluation criteria that drive complementarity into program execution, post-award grant administration, regulation, and oversight. Such coordination of Federal funding strategies will empower regional networks to find the support they need to thrive. Agency partnerships with programs such as the EDA Build Back Better Regional Challenge[108], Good Jobs Challenge[109], and Build to Scale Program[110] will help foster recovery of all U.S. communities, create good-paying jobs, and maintain the United States' global leadership in advanced manufacturing.

Recommendation 3.3.5 Improve Public-Private Partnerships: *Support existing and new public private partnerships for development of advanced manufacturing technologies in tandem with workforce education. Continue to use Federal convening powers to ensure that relevant parties, particularly SMMs and underserved communities, are fully engaged. Seek greater alignment and accessibility of Federal grant programs for such collaborations.*

Well-designed and operated public-private partnerships have pivotal contributions to make in strengthening advanced manufacturing ecosystems. Public-private partnerships can attract and focus resources while providing frameworks to connect essential stakeholders including industry, Federal laboratories, educational institutions, workforce investment boards, and labor and community organizations as well as Federal and state agencies. Manufacturing USA Institutes, the NSF Engineering Research Centers and Industry-University Research Partnerships, and the MEP Centers, serve as excellent examples of collaborations and partnerships that de-risk new technologies, push these technologies to higher MRL/TRL levels, and provide great educational opportunities. The recently announced AM Forward compact to encourage SMM adoption of additive technologies could be extended to other technologies and industries.[111]Community colleges and feeder high schools must also be integrated into local and regional partnerships to establish new educational programs and support partnership initiatives.

Greater efforts must also be made to select and strategically align Federal grant programs. The strength of relationships within public-private partnerships determines their survival and growth. Thus, ongoing facilitation is needed by an intermediary group or individual to ensure that each partnership's return on investment is widely understood and remains positive.

[108] https://eda.gov/arpa/build-back-better/
[109] https://eda.gov/arpa/good-jobs-challenge/
[110] https://eda.gov/oie/buildtoscale/
[111] https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/06/fact-sheet-biden-administration-celebrates-launch-of-am-forward-and-calls-on-congress-to-pass-bipartisan-innovation-act/

NISTIR 8107

Current Standards Landscape for Smart Manufacturing Systems

Yan Lu
KC Morris
Simon Frechette

This publication is available free of charge from:
http://dx.doi.org/10.6028/NIST.IR.8107

National Institute of Standards and Technology
U.S. Department of Commerce

NISTIR 8107

Current Standards Landscape for Smart Manufacturing Systems

Yan Lu
KC Morris
Simon Frechette
Systems integration Division
Engineering Laboratory

This publication is available free of charge from:
http://dx.doi.org/10.6028/NIST.IR.8107

February 2016



U.S. Department of Commerce
Penny Pritzker, Secretary

National Institute of Standards and Technology
Willie May, Under Secretary of Commerce for Standards and Technology and Director

Abstract

Today's manufacturers face ever-increasing demands of variability—greater customization, smaller lot sizes, sudden supply-chain changes and disruptions. Successful manufacturers will have to choose and incorporate technologies that help them quickly adapt to rapid change and to elevate product quality while optimizing use of energy and resources. These technologies form the core of an emerging, information-centric, Smart Manufacturing System that maximizes the flow and re-use of data throughout the enterprise. The ability of disparate systems, however, to exchange, understand, and exploit product, production, and business data rests critically on information standards. This report provides a review of the body of pertinent standards—a standards landscape—upon which future smart manufacturing systems will rely. This landscape comprises integration standards within and across three manufacturing lifecycle dimensions: product, production system, and business. We discuss opportunities and challenges for new standards, and present emerging activities addressing these opportunities. This report will allow manufacturing practitioners to better understand those standards useful to integration of smart manufacturing technologies.

Disclaimer

Certain commercial systems are identified in this paper. Such identification does not imply recommendation or endorsement by NIST; nor does it imply that the products identified are necessarily the best available for the purpose. Further, any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of NIST or any other supporting U.S. government or corporate organizations.

CONTENTS

1 Introduction 1

2 Smart Manufacturing Ecosystem 2

2.1 Smart Manufacturing Capabilities 2

2.2 Smart Manufacturing Ecosystem 4

2.3 Impacts of Standards 6

3 Manufacturing Standards landscape 6

3.1 Standard Organizations 6

3.2 Product Development Lifecycle Standards 8

3.3 Production System Lifecycle Standards 11

3.4 Business Cycle for Supply Chain Management 16

3.5 Manufacturing Pyramid 18

3.6 Standards Adoption and the Related Issues 22

4 Standards Opportunities for Smart Manufacturing 24

4.1 Standards Needs 24

4.2 New Initiatives 27

4.2.1 Industrie 4.0 27

4.2.2 Internet of Things (IoT) 28

4.2.3 Cyber Physical Systems (CPS) 29

4.2.4 Big Data and Cloud Manufacturing 29

4.2.5 Smart Manufacturing Initiatives in the U.S. 29

4.2.6 SDO Smart Manufacturing Related Activities 30

4.2.7 Sustainable Manufacturing Standards 30

5 Conclusion 31

6 References 32

1 INTRODUCTION

A manufacturer's sustainable competitiveness depends on its capabilities with respect to cost, delivery, flexibility, and quality [1]. *Smart Manufacturing Systems* (SMS) attempt to maximize those capabilities by using advanced technologies that promote rapid flow and widespread use of digital information within and between manufacturing systems[2][3][4]. SMS are driving unprecedented gains in production agility, quality, and efficiency across U.S. manufacturers, improving long-term competitiveness. Specifically, SMS use information and communication technologies along with intelligent software applications to

1. Optimize the use of labor, material, and energy to produce customized, high-quality products for on-time delivery.
2. Quickly respond to changes in market demands and supply chains.

Smart manufacturing, different from other technology-based manufacturing paradigms, defines a vision of next-generation manufacturing with enhanced capabilities. It is built on emerging information and communication technologies and enabled by combining features of earlier manufacturing paradigms. Table 1 shows the relationship between SMS and previous manufacturing paradigms.

Table 1: Smart Manufacturing and other manufacturing paradigms[1, 2, 3, 4, 5 and 6]

Smart Manufacturing Characteristics	Other Manufacturing Paradigms	Enabling Technology
• Digitization of every part of a manufacturing enterprise with interoperability and enhanced productivity • Connected devices and distributed intelligence for real time control and flexible production of small batch products • Collaborative supply chain management with fast responsiveness to market changes and supplying chain disruption • Integrated and optimal decision making for energy and resource efficiency • Advanced sensors and big data analytics through product lifecycle to achieve fast innovation cycle	**Lean Manufacturing** - Emphasis on utilizing a set of "tools" that assist in the identification and steady elimination of all kinds of waste in a manufacturing system[1]	Process leveling; work flow optimization; real-time monitoring and visualization
	Flexible Manufacturing - utilizing an integrated system of manufacturing machine modules and material handling equipment under computer control to produce products with changed volume, process and types[2]	Modularized design; interoperability; service oriented architecture
	Sustainable Manufacturing - creating products with minimal negative environmental impacts while conserving energy and natural resources and enhancing human safety[3].	Advance materials; sustainable processes metrics and measurement, monitoring and control
	Digital Manufacturing - using digital technology through product lifecycle to improve product, process, and enterprise performance and reduce the time and cost of manufacturing[4].	3D modeling; model based engineering; product lifecycle management
	Cloud Manufacturing – - a form of decentralized and networked manufacturing based on cloud computing and service-oriented architecture (SOA)[5].	Cloud Computing, IoT, virtualization, service-oriented technologies, and advanced data analytics
	Intelligent Manufacturing - implementing artificial intelligence based intelligent production that can automatically adapt to changing environments and varying proc ess requirements, with minimal intervention from human[6].	Artificial intelligence ; Advanced Sensing and control; optimization; knowledge management
	Holonic Manufacturing - applying agents to a dynamic and decentralized manufacturing process, so that changes can be made dynamically and continuously[7].	Multi-agent systems; decentralized control; model based reasoning and planning
	Agile Manufacturing - utilizing effective processes, tools, and training to enable manufacturing systems to respond quickly to customer needs and market changes while still controlling costs and quality[8].	Collaborative engineering, supply chain management, product life cycle management

[1] Strategos-International. Toyota Production System and Lean Manufacturing, http://www.strategosinc.com/toyota_production.htm
[2] Flexible and reconfigurable manufacturing systems paradigms, Int J Flex Manuf Syst (2006) 17:261–276 DOI 10.1007/s10696-006-9028-7
[3] Glossary of Sustainable Manufacturing Terms, EPA, http://archive.epa.gov/sustainablemanufacturing/web/html/glossary.html
[4] DOE-FOA-0001263 Manufacturing innovation institute for smart manufacturing: advanced sensors, controls, platforms, and modeling for manufacturing.
[5] Cloud-Based Manufacturing: Old Wine in New Bottles? , Proceedings of the 47th CIRP Conference on Manufacturing Systems
[6] http://www.astri.org/technologies/initiatives/intelligent-manufaturing/

In 2014 in the United States, the President's Council of Advisors on Science and Technology (PCAST) issued a report that identified three top-priority transformative manufacturing technologies: Advanced Sensing, Control, and Platforms for Manufacturing; Visualization, Informatics and Digital Manufacturing Technologies; and Advanced Materials Manufacturing [5]. The first two of the technologies enhance the manufacturer's ability to respond to information quickly and efficiently. They, in turn, rely on the effective information flow and system responsiveness that only standards can provide. The PCAST further noted that standards "spur the adoption of new technologies, products and manufacturing methods. Standards allow a more dynamic and competitive marketplace, without hampering the opportunity to differentiate. Development and adoption of standards reduce the risks for enterprises developing solutions and for those implementing them, accelerating adoption of new manufactured products and manufacturing methods."

Standards are the building blocks that provide for repeatable processes and the composition of different technological solutions to achieve a robust end result. Standards come in many varieties and forms. Standards.gov [6] and OMB Circular A-119 [46] describe, in some detail, the variety of forms standards can take. The standards that we will discuss are primarily "voluntary consensus standards." This means they are set by a standards organization based on the consensus of the partners who will be using them. In addition, these types of standards are enforced by voluntary compliance. Such standards are designed to open new market opportunities to their users. The standards supporting SMS range from those for information technology and communication through those that govern enterprises and supply chains.

This paper presents an SMS standards' landscape based on a definition of a smart-manufacturing ecosystem that encompasses three dimensions – product, production systems, and enterprise (business) systems. The landscape associates standards with the lifecycle phases in each dimension. Section 2 presents key capabilities and the manufacturing ecosystem as the convergence of the three different lifecycle perspectives in operational manufacturing systems. It also identifies areas where the integration of functions within and across these dimensions will result in systems that are more effective. Section 3 describes the landscape in terms of key standards' organizations working in the area, types of standards in each of the three dimensions, and the manufacturing pyramid where the dimensions intersect. Finally, we discuss areas of opportunity for future standards in terms of the smart manufacturing capabilities.

2 SMART MANUFACTURING ECOSYSTEM

Standards are fundamental for enabling SMS. Different standards contribute in different ways to enabling the capabilities of smart manufacturing systems. To generate an SMS landscape, we identify the standards as within scope based on whether a standard contributes to a capability, and analyze where, when, and for what purpose the standard is used. This section defines the key capabilities and presents a visualization of a smart manufacturing ecosystem. The following section presents the standards landscape for the ecosystem.

2.1 SMART MANUFACTURING CAPABILITIES

Significant and positive relationships exist between manufacturing strategies and corporate competitive strategies [47]. To achieve corporate competitive goals, manufacturing systems should be developed with capabilities aligned to a firm's competitive strategy, which usually consists of cost control and differentiation strategies of quality, delivery, innovation, service, and environmentally sustainable production. We classify key SMS-enabling capabilities into four categories including productivity, agility, quality, and sustainability (These characteristics are discussed in more detail in [14].) Table 2 shows a mapping of SMS capabilities to corporate competitive strategies.

To analyze the role of existing manufacturing standards, we summarize the key SMS capabilities as follows:

Productivity: Manufacturing productivity is defined as the ratio of production output to inputs used in the production process [89]. Productivity can be broken down further to labor productivity and material and energy efficiency. As production sizes increase, typically productivity increases; however, for SMS for which customization is a hallmark, productivity measures may need to be adjusted to be more inclusive of responsiveness to customer demand.

Agility: Agility is defined as "the capability of surviving and prospering in a competitive environment of continuous and unpredictable change by reacting quickly and effectively to changing markets, driven by customer-designed products and services" [7]. Critical to the success of agile manufacturing are enabling technologies such as model-based engineering, supply chain integration, and flexible production systems with distributed intelligence. Traditional metrics to measure agility include *On Time Delivery to Commit*, *Time to Make Changeovers, Engineering Change Order Cycle Time,* and *Rate of New Product Introduction* [8]. New measures could include *Delay Due to Supply Chain Change*.

Table 2: Key Capabilities for Smart Manufacturing System

Corporate Competitive Strategy	SMS Key Capability	Capability Decomposition	Performance Metrics
Cost Control	**Productivity**	Throughput	Products being produced on a machine, line, unit, or plant over a specified period of time
		OEE	Overall Equipment Effectiveness - a multiplier of Availability x Performance x Quality
		Material/Energy efficiency	Material/Energy (electricity, steam, oil, gas, etc.) required to produce a specific unit or volume of production
		Labor productivity	Worker hours per unit of production
Differentiation	**Agility**	Response to changes	Time to Make Changeovers, Rate of New Product Introduction, Engineering Change Order Cycle Time
		On-Time Delivery to Commit	The percentage of time that manufacturing delivers a completed product on the schedule
		Resilience to faults	Downtime in Proportion to Operating Time
	Quality	Product quality	Yield, Customer Rejects/Returns, and Material Authorizations/Returns
		Innovation	Product innovativeness
		Variety	Variety/product family; Options Per Product; Personalization options
		Customer service	Customer reviews on services
	Sustainability	Product	Recyclability, Energy Efficiency, Durability, Remanufacturability
		Process	Primary energy use; Greenhouse gas emission
		Logistics	Transportation fuel usage; Refrigeration energy usage

Quality: Traditional quality measures reflect how well finished products meet design specifications. In addition, for SMS, quality also includes measures of product innovation and customization. Traditional quality metrics include *Yield*, *Customer Rejects/Returns*, and *Material Authorizations/Returns* [8]. New quality measurement indicators for innovativeness and variety/product family and options/product to measure personalization degree are needed.

Sustainability: While time and cost as measures of productivity have been the traditional drivers for manufacturing, sustainability has taken on more importance. Measurement science for manufacturing sustainability is not as mature as for time and cost and is an active area of research [18] [19]. As productivity and agility of manufacturing systems increases, the necessity for better understanding and controlling the sustainability-related impacts of those systems increases. Manufacturing sustainability is defined in terms of environmental impact (such as energy and natural resources), safety and well-being of employees, and economic viability [9].

2.2 SMART MANUFACTURING ECOSYSTEM

The Smart Manufacturing Ecosystem encompasses a broad scope of systems in the manufacturing business including production, management, design, and engineering functions. Figure 1 illustrates three dimensions of concern that are manifest in SMS. Each dimension—product (green), production system (blue), and business (orange)—is shown within its own lifecycle. The product lifecycle is concerned with the information flows and controls beginning at the early product design stage and continuing through to the end-of-life of the product. The production system lifecycle focuses on the design, deployment, operation and decommissioning of an entire production facility including its systems. The business cycle addresses the functions of supplier and customer interactions. Each of these dimensions comes into play in the vertical integration of machines, plants, and enterprise systems in what we call the Manufacturing Pyramid (Figure 5). The integration of manufacturing software applications along each dimension helps to enable advanced controls at the shop floor and optimal decision-making at the plant and enterprise. The combination of these perspectives and the systems that support them make up the ecosystem for manufacturing software systems. Details of the lifecycle of the three dimensions, as well as the Manufacturing Pyramid, will be described in Section 3.

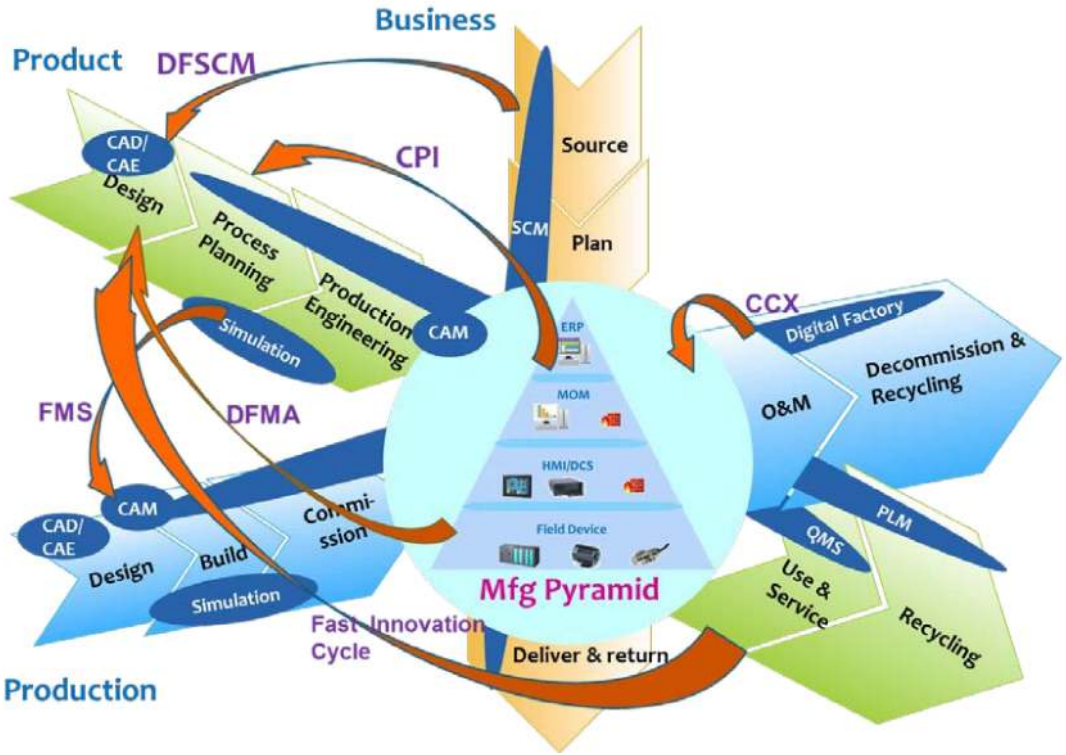


Figure 1. Smart Manufacturing Ecosystem

Historically, these dimensions have been dealt with as silos of concern. Indeed, integration along even one of these dimensions is a non-trivial challenge and is being actively worked on. We have observed that organizations that were formed to integrate single dimensions of this ecosystem are expanding in scope to address the digital thread across the dimensions (orange arrows in Figure 1). Paradigms such as continuous process improvement (CPI), flexible manufacturing (FMS), and design for manufacturing and assembly (DFMA) rely on information exchange between the dimensions as indicated in Figure 1. Tighter integration within and across the three dimensions will result in faster product-innovation cycles, more efficient supply chains, and more flexibility in production systems. The combination of these allows for optimal control of the automation and decision-making needed to make high quality, highly customized goods in tight synchronization with the demand for these goods [10].

Essentially, it is the seamless integrations within and across SMS dimensions and the manufacturing pyramid that lead to SMS capabilities. Table 3 shows the integration technologies highlighted in Figure 1 and the SMS capabilities supported by them.

Table 3: SMS Ecosystem and Capability Mapping

	Description	Information Flow	Key Capabilities Supported
PLM	Product life cycle management - is the process of managing the entire lifecycle of a product from inception, through engineering design and manufacture, to service and disposal of manufactured products	Bi-directional information flow through product and production system lifecycle	Quality, Agility and Sustainability
SCM	Supplying chain management - The management of upstream and downstream value-added flows of materials, final goods, and related information among suppliers, company, resellers, and final consumers.	Bi-directional information flow among supply chain stakeholders – manufacturers, customers, suppliers and distributors	Agility, Quality, Productivity
DFSCM	Design for Supply Chain Management - designing products to take advantage of and strengthen supply chain.	Bi-directional information flow between supply chain management activities and design engineers activities	Quality and Agility
CPI	Continuous process improvement - is the set of on-going systems engineering and management activities used to select, tailor, implement, and assess the processes used to produce products.	Information flow from run-time manufacturing system to process design activities	Quality, Sustainability, Productivity
CCX	Continuous Commissioning - ongoing process of diagnosis, prognosis and performance improvement of production systems	Bi-directional Information between production engineering activities and production operation activities	Productivity, Agility, Sustainability and Quality
DFMA	Design for Manufacturing and Assembly - the design for ease of manufacture of the parts the design of the product for ease of assembly.	Information flow from production engineering, operation activities to product design activities	Productivity and Agility
FMS/RMS	Flexible Manufacturing System/Reconfigurable Manufacturing system - machines are flexible and can be configured to produce changed volume or new product types with or without changed process	Information flow from product engineering activities to production engineering activities	Agility
Manufacturing Pyramid	The hierarchical nature of existing manufacturing systems illustrated by a three-level pyramid including ERP, MoM and shop floor.	Bi-directional flow among ERP, MoM activities and control systems	Quality, Agility, Productivity and Sustainability
Fast Innovation Cycle	To improve New Product Introduction (NPI) Cycle by anticipating trends through gathering data from product usage and feeding it back into product ideation	Information flow from product use to product design	Quality and Agility

2.3 IMPACTS OF STANDARDS

Standards are fundamental and valuable tools that can enable the adoption of technologies and innovations by business owners. Accordingly, they contribute to one or more SMS key capabilities. For example, on the product dimension, PLM standards contribute to both agility (by streamlining processes) and quality (by enabling the integration of different activities along the product and production system lifecycles). In the production system area, continuous commissioning (CCX) standards can improve machine performance and systems reliability to improve productivity, quality, and sustainability (through improved energy performance). Standards for electronic commerce such as the Open Applications Group Integration Specification (OAGIS) help streamline business processes between partners in the supply chain.

The next section presents a landscape of manufacturing standards on top of the SMS ecosystem where we see clearly existing manufacturing standards and how they can enhance SMS capabilities, if adopted.

3 MANUFACTURING STANDARDS LANDSCAPE

Existing manufacturing standards provide "how-to" instructions for designers, engineers, builders, operators, and decision makers to conduct disciplined activities within their domains. They also facilitate communication between stakeholders across domain borders, borders of the manufacturing system hierarchy, and between lifecycle phases. Today, numerous national, regional, and international standards development organizations (SDOs) set manufacturing industry standards. This section provides a review of the types of standards for each of the three lifecycle dimensions with a focus on those standards that specifically address manufacturing information content. While some national or regional standards are considered, more emphasis is placed on international standards. In many cases, local SDOs may have direct liaisons with international SDOs. First, we provide an overview of the standards development organizations and then we position the standards within the ecosystem.[7]

3.1 STANDARD ORGANIZATIONS

A completed standard is typically the result of one of several development processes. The more traditional of these is via a formally sanctioned SDO. These organizations facilitate consensus building and ensure that standards are openly available to organizations that wish to use them. In this category are both international standards bodies, such as ISO [20] IEC [30], ASME [21], and ASTM [22]; and national bodies including professional organizations, which define best practices for their practitioners. In the United States, ANSI [23] certifies professional organizations to create standards in areas of specialization.

The traditional consensus-building process used by SDOs can be quite time-consuming; as a result, other processes have emerged, including *open source* [24]. In the open-source process, a standard can come in the form of a specification describing the standard, a reference implementation of the standard, or both. These standards are often developed within a consortium, maintained collaboratively, and widely available to the public at large. Ownership of these standards remains a public trust of various sorts and they are open to interested participants. The licensing and governance models for the intellectual property contained in these standards vary greatly between projects. Open-source standards sometimes proceed to a more formal sanction by an SDO. An independent organization usually manages the open source process. Some vendor-driven

[7] In the interest of brevity, we do not provide references for every standard described. They are easily accessible through an Internet search.

standardization communities have taken another approach whereby a vendor implementation of a proposed standard is selected to define the standard. The chosen implementation becomes the reference to which other vendors implement.

Multiple standards intended to work together are often defined as suites. Examples of this in the Information Technology (IT) world include the collection of standards from groups like WC3 [25] and IETF [26] that have aided the digital revolution. In the world of manufacturing, we find the ISO 10303 suite of standards (commonly known as STEP) for product data [27], the Quality Information Framework(QIF)[32] for streamlining quality testing capabilities, and the standards emerging from consortia such as the Open Application Group, Inc. (OAGi) for enterprise level applications [28]. These standards incorporate other, more fundamental, standards, e.g., the EXtensible Markup Language (XML) from W3C, and offer engineering and manufacturing content representation and interpretation. The Object Management Group (OMG) [38] also defines suites of standards that, for the most part, address underlying technologies rather than those specific to manufacturing. Some of these standards have become particularly useful for manufacturing application and are discussed later.

ISO and IEC are working on standards of significant importance to smart manufacturing. Within ISO, the technical committee on automation systems and integration (TC184) has two subcommittees (SC) that are of particular interest in our landscape: SC4 and SC5. SC4 focuses on industrial data standards – primarily those related to product data including ISO 10303. SC5 focuses on interoperability, integration, and architectures for automation applications. Both subcommittees have new standards for smart manufacturing in development.

IEC, which historically has served the electronics industry, has developed standards that have broader applicability beyond the electronics industry. For example, IEC TC 65 focuses on standards for industrial process control and automation and is active in addressing integration between product data and production processes. ISO/IEC Joint Technical Committee (JTC) 1 on information technology deals with a large number of standardization topics in IT for manufacturing systems including sensor and device networks and user interfaces. Consequently, these types of standards are also included in our landscape.

A number of consortia are developing standards and best practices in the SMS area including OAGi, MTConnect [29], ProSTEP iViP [81], OPC Foundation [31], DMSC [32], and MESA [33]. Standards and best practices from these organizations are sometimes proposed in ISO and IEC to facilitate broader dissemination and adoption. OAGi and MTConnect make standards freely available as open source for downloading to the public. PDES Inc., for example, is an industrial consortium that undertakes projects related to product data exchange for design. Their projects are driven by its members' specific needs for data integration standards. Results are fed into the ISO 10303 standards for product definition and others as appropriate. The work often addresses resolving issues surrounding the implementation of those standards. The OPC Foundation originally developed standards that allowed device providers to integrate their products into a Microsoft-based platform. OPC Foundation has since evolved into an independent standards organization with its own certification and testing program. Dimensional Metrology Standards Consortium (DMSC) [32] sets standards including QIF, which is fundamental for assuring that the entire quality-measurement process—consisting of product measurement design, planning, rules, resources, programming, results, and summary statistics—is fully integrated and traceable.

APICS [35], ASTM, MESA, IPC [79], and ISA [34] are industrial professional societies or trade associations working to advance the state-of-the-art in their fields. Their work includes standards, as well as educational and other activities. The APICS scope is supply chain and operations management. A part of APICS, known as the Supply Chain Council, produced a series of reference documents to provide guides on best practices for the

supply chain industry. This rich set of information includes definitions for a wide range of performance metrics for manufacturing operations, many of which can be applied outside of the supply chain context. ASTM addresses manufacturing and materials, products and processes, systems, and services. MESA is concerned with the production level of Manufacturing Operations Management (MOM) or Manufacturing Executions Systems (MES) and the integration of information systems from the enterprise level into the manufacturing operation. IPC originated with the electronics industry, specifically focusing on printed circuit boards, but, as with many of the other organizations, its scope has expanded to address service and supply chain topics as well. ISA focuses on automation, specifically as applied to "engineering and technology to improve the management, safety, and cybersecurity of modern automation and control systems used across industry and critical infrastructure."[34] While each of these organizations brings a different perspective, their scopes intersect in our focus areas - product, production system, and business information flows.

Other noteworthy standards come from more academically oriented professional societies, which typically are ANSI accredited. These include the standards from IEEE [37] and ASME.

3.2 PRODUCT DEVELOPMENT LIFECYCLE STANDARDS

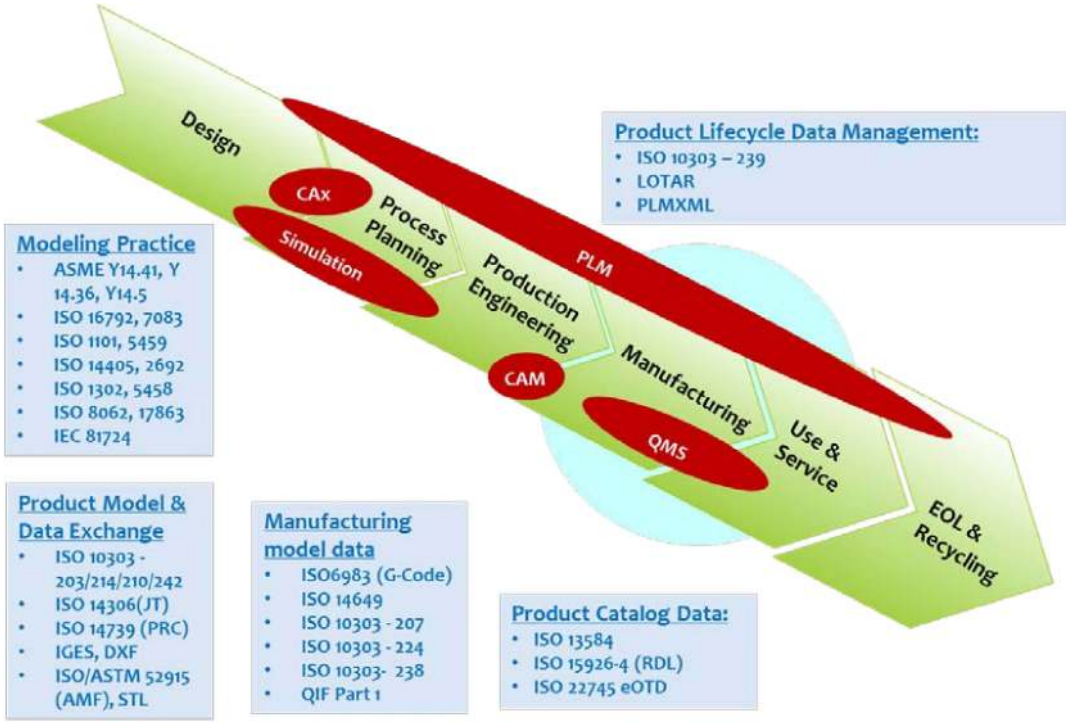


Figure 2. Standards along the Product Lifecycle

The product lifecycle in the context of the smart manufacturing ecosystem includes 6 phases as shown in Figure 2: Design, Process Planning, Production Engineering, Manufacturing, Use and Service, and End-of-Life and Recycling. The existing standards, particularly in the areas of Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), and Computer Aided Technology (CAx) generally have greatly improved engineering efficiency [11]. In addition, these standards enhance modeling accuracy and reduce product innovation cycles, thus contributing directly to manufacturing system agility and product quality. Advancements in this area have resulted in a new product development paradigm known as model-based engineering or enterprise, or MBE [51].

Figure 2 also shows a set of select standards related to the product lifecycle phases. These standards are classified into five categories: Modeling Practice, Product Model and Data Exchange, Manufacturing Model Data, Product Category Data, and Product Lifecycle Data Management.

Modeling practice standards define digital product-definition data practices for both two-dimensional (2D) drawings and three-dimensional (3D) models. There are several standards available worldwide that define symbols and rules for dimensioning and tolerancing. The predominant standards are ASME (American Society of Mechanical Engineers) Y14.5 GD&T (Geometric Dimensioning and Tolerancing) and International Organization for Standardization, ISO/TC 213 GPS (Geometrical Product Specification) with ISO/TC 10 Technical Product Documentation. The ISO (GPS) standards are typically address a single topic. The ASME Y14.5 standard combines a set of topics for GD&T in one standards document. In addition to GD&T, ASME Y14.36M and ISO 1302 are established standards for communicating surface texture control requirements and defining surface texture properties. The joint IEC/ISO standard 81714 defines graphical symbols for use in technical documentation of products. Table 4 lists selected modeling practice standards from ASME and ISO. There are also standards for specific manufacturing domains such as electronics product modeling practice including IPC-D-325 for printed boards, assemblies, and supporting drawings.

Table 4: Modeling Practice Standards

SDOs	Standards	Description
ASME	ASME Y14.36	Surface Texture Symbols
	ASME Y14.41	Digital Product Definition Data Practices
	ASME Y14.5	Dimensioning and Tolerancing
ISO TC 10	ISO 16792	Technical product documentation -- Digital product definition data practices
	ISO 128	Technical drawings -- General principles of presentation
	ISO 7083	Technical drawings -- Symbols for geometrical tolerancing -- Proportions and dimensions
ISO TC 213 Geometrical Product Specifications (GPS)	ISO 1101	Geometrical tolerancing -- Tolerances of form, orientation, location and run-out
	ISO 5459	Geometrical tolerancing -- Datums and datum systems
	ISO 14405	Dimensional tolerancing
	ISO 2692	Geometrical tolerancing -- Maximum material requirement (MMR), least material requirement (LMR) and reciprocity requirement (RPR)
	ISO 5458	Geometrical tolerancing -- Positional and pattern tolerancing
	ISO 1302	Indication of surface texture in technical product documentation
	ISO 8062	Dimensional and geometrical tolerances for moulded parts
	ISO 17863	Tolerancing of moveable assemblies
IEC/ISO	IEC/ISO 81714	Design of graphical symbols for use in the technical documentation of products
IPC	IPC-D-325	Documentation Requirements for Printed Boards, Assemblies and Support Drawings

Product model and data exchange standards include ISO standards and de facto standards, as shown in Table 5. These standards capture the representation of product and engineering information to enable data exchange between CAD software from different vendors. STEP is unique in that it addresses a broader range of information than is needed for CAD representations. The STEP architecture includes underlying methods for the definition and exchange of data and an architecture for integrating the data definitions into implementable units, called Application Protocols (AP), where CAD information is connected to product structure, as well as a wide array of other engineering and lifecycle information elements. The most commonly implemented and used APs are 203 for aerospace, defense and AP 214 for automotive [52]. The most recent part of STEP to be released is AP 242 edition 2, titled "Managed Model Based 3D Engineering" [48][52]. This standard merges AP 203 and AP 214 and incorporates requirements for data exchange in the areas of model-based development, product data management (PDM), product and manufacturing information (PMI), and long-term archiving of digital data. AP 242 is complementary to other visualization exchange formats such as JT (ISO 14306) and PRC (ISO 14739). Another set of standards for product modeling is used in additive manufacturing areas. The Stereo Lithography (STL) file format is widely used for rapid prototyping, 3D printing and additive manufacturing. ISO 52915, Additive Manufacturing File Format (AMF), is an open standard proposed to describe color, materials, lattices, and constellations of a 3D object that allows more complex descriptions of products, beyond basic geometry.

Table 5: Product Model and Data Exchange Standards

Standards	Description
ISO 10303 - 203/214/210/212/242	203: Configuration controlled 3D designs of mechanical parts and assemblies – aerospace and defense
	214: Core data for automotive mechanical design processes
	210: CAD systems for printed circuit board
	212: CAD systems for electrical installation and cable harness
	242: specifies the application protocol for Managed model based 3d engineering.
ISO 14306(JT)	A CAD file format described in ISO 14306:2012 is used primarily in industrial use cases as the means for capturing and repurposing lightweight 3D product definition data.
ISO 14739(PRC)	Document management -- 3D use of Product Representation Compact (PRC) format
IGES	An ASCII-based exchange format adopted by the American National Standards Institute (ANSI) since 1976. All meaningful development of IGES stopped in 1996 at version 5.3.
STL	A de-facto file format describe only the surface geometry of a three-dimensional object for additive manufacturing.
ISO/ASTM 52915 (AMF)	A new and open XML based standard developed as a replacement for STL format. AMF has many additional features compared to the STL format, including curved patches, recursive subdivision, multiple materials, graded materials, internal structures, material properties, colors, graphics, constellations, and metadata support.

Manufacturing model data standards, in contrast to the product model standards that focus on product design, define the data needed to manufacture a product from a design (Table 6). ISO 6983, or G-Code, is the most widely used Numerical Control (NC) programming language. ISO 14649 was developed to overcome the problems of ISO 6983 by defining a data model to enable a link between manufacturing operations and the original CAD geometry data. STEP AP 238 is designed to extend ISO 14649 in order to integrate more tightly with product design definitions. It can exchange explicit toolpath descriptions along with part, stock, fixture geometry, tool descriptions, GD&T, and PDM information.

Table 6: Manufacturing Model Data Standards

Standards	Description
ISO 6983 (G-Code)	Numerical control of machines -- Program format and definitions of address words. The most widely used numerical control (NC) programming language
ISO 14649	Standard that specifies the technology-specific machine tool description data elements needed as process data for manufacturing and machine characteristics.
ISO 10303-207/224/238	207 -Sheet metal die planning and design
	224 - Mechanical product definition for process plans using machining features
	238 –Application interpreted model for computer numeric controllers

Product catalog data standards support the description of particular instances of products or parts in a uniform, vendor-neutral way. Examples of product catalog data standards include ISO 13584, 15926-Part 4 and 22745. The first two of these focus on methods for catalog definition. ISO 13854 specifies the principles to be used for defining characterization classes of parts and properties of parts independent from any particular supplier-defined identification. ISO 22745 provides guidelines for the development of terminology for open technical dictionaries and inventory and catalog systems. In contrast, 15926 Part 4 represents a specific domain and defines the engineering terms required to design, build, and operate an oil and gas production facility.

Product lifecycle data management focuses on the needs of long-term retention and access to data consistently throughout the product lifecycle. The best-known product lifecycle data management standard is ISO 10303 AP239, also known as Product Life Cycle Support (PLCS). AP 239 is designed for the exchange of complex-product for life-long support, i.e., the information needed and created during the use and maintenance of products. PLM XML is an emerging open format from Siemens for facilitating PLM. PLM XML is designed as a lightweight, extensible, and flexible format for sharing product design and function data in a collaborative environment [53]. The related LOTAR (LOng Term Archiving and Retrieval) International Project has an even broader scope. The LOTAR focus is long-term access to digital product and technical information through the development of standards-based archival and retrieval mechanisms. The results of that effort are recommended practices on how standards can be applied to long-term archiving of products and associated design information.

3.3 Production System Lifecycle Standards

“Production systems” here refers to collections of machines, equipment, and auxiliary systems organized to create goods and services from various resources.[49] Most product-model and modeling-practice standards are applicable to production system development as well. However, as one of the most complex product systems that is intended to manufacture goods, production systems have a number of unique standards that are fundamental to achieving SMS. Production systems usually have a much longer lifecycle than the goods that they produce. Additionally, they need to be frequently reconfigured, and thus have unique needs with respect to their design. The unique SMS capabilities discussed here are made possible by automation standards for system control and maintenance. In this subsection, we focus on standards supporting complex system modeling, automation engineering, and operation and maintenance (O&M) perspectives of production systems.

Typical lifecycle phases for a production system as shown in Figure 3 include Design, Build, Commission, O&M, and Decommission. Production systems and facilities are typically designed to manufacture a family of products. The degree of manufacturing flexibility—how adaptive a production system is in responding to market and

supply chain changes—is a key design decision that not only impacts cost but also influences the length of the production system lifecycle. The commissioning phase involves testing the entire production system, including equipment, plant and facility, and handing off the system for operation. The system is verified to function according to the design objectives and specifications. After commissioning, the production system enters O&M– a steady state of tactical operations and strategic maintenance activities. When radical internal or external changes are introduced, for example, if the main subsystems crash or the targeted product group is phased out of the market, the life of the product system comes to an end. At this point, production permanently ceases or the system is recycled. The steady-state O&M stage is typically the longest phase of a production system's lifecycle. During this period, production systems are managed to best transform material, energy, and labor into products. In this phase, adaptation planning, re-commissioning, and continuous commissioning are conducted to maintain and improve system performance and search for ways to reconfigure the system to adapt to changes in the market and supply chain.

Areas of standards that support production lifecycle activities include Production System Model Data and Practice, Production System Engineering, O&M, and Production Lifecycle Management. Since the O&M stage is the longest phase, the standards for O&M and lifecycle management merit special attention. Specifically, standards supporting manufacturing operations are discussed in detail in the Manufacturing Pyramid subsection.

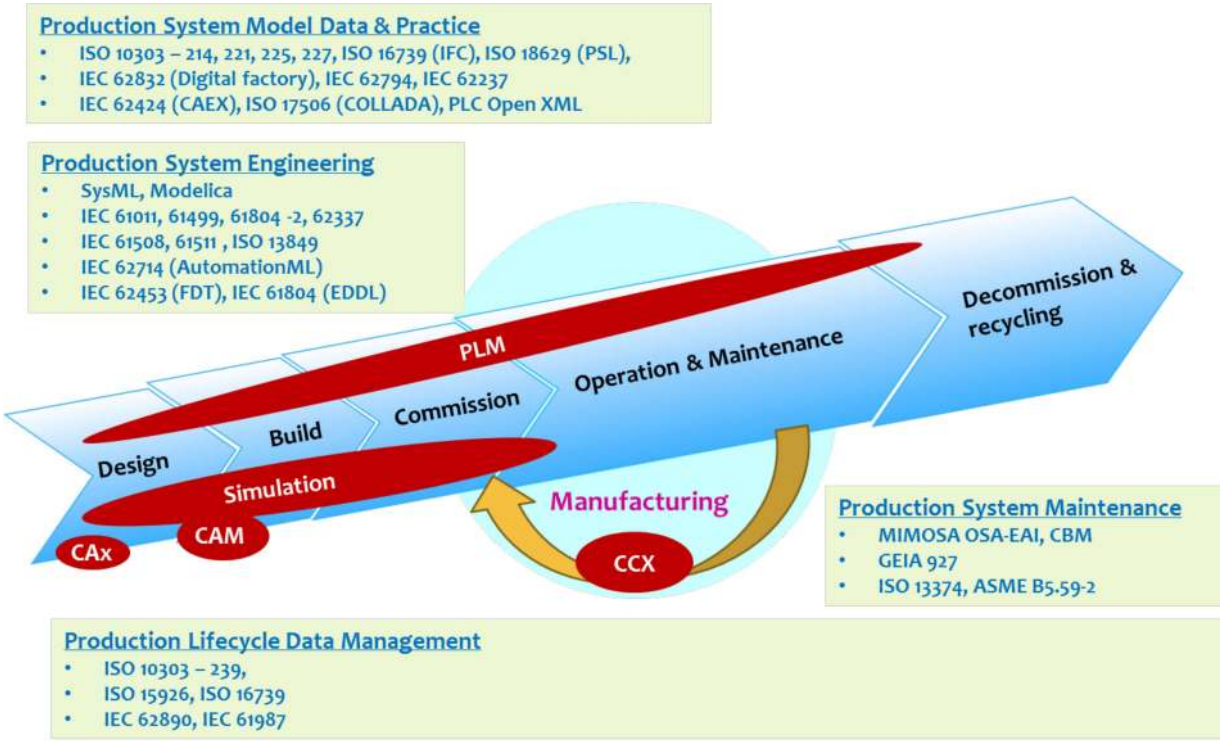


Figure 3. Standards for Production System Lifecycle

Production system model data and practice standards provide information models for factory and production system design. They enhance information exchange among stakeholders, and enable virtual commissioning, which can improve manufacturing agility and reduce manufacturing cost. Besides CAx standards, several international standards specific to production system modeling and data exchange exist. The standards in this area can be classified into two domains as shown in Table 7: manufacturing resource and process, and building/facility modeling. ISO 10303 AP 214 has been shown to be able to represent different aspects of a manufacturing system in development [53]. ISO 10303 AP 221 defines functional data for, and schematic representation of, process plants. ISA 95 defines an equipment hierarchy model and models manufacturing processes [34]. ISO 18629 defines a Process Specification Language (PSL) aimed at identifying and formally defining and structuring the semantic concepts intrinsic to the capture and exchange of process information related to discrete manufacturing. IEC 62832(Digital Factory) defines a comprehensive network of digital models, methods, and tools to represent the basic elements and automation assets, as well as the behavior and relationships between these elements/assets. The digital factory concept includes five views of information: Construction (C), Function (F), Performance (P), Location (L) and Business (B). ISO 17506 defines an open standard for exchanging digital assets among various graphics software applications for plant geometry representation and kinetics simulation. The Core Manufacturing Simulation Data (CMSD) Information Model was developed by NIST and standardized by the Simulation Interoperability Standards Organization (SISO) to define a

Table 7: Production System Modeling and Practice Standards

Domain	Standards	Description
Manufacturing Resource and Process Domain	ISO 10303-214/221	214: Core data for automotive mechanical design processes to represent a manufacturing system which is a part of factory design 221-Functional data and schematic representation of process plants
	ISA 95	Defines hierarchy models for a manufacturing enterprise and function/activity/object models for Manufacturing Operations Management
	IEC 62424	Provides neutral data format that allows storage of hierarchical plant object information
	ISO 18629	Process Specification Language developed by NIST is a set of logic terms used to describe processes.
	IEC 62832	Industrial-Process Measurement, Control and Automation—Reference Model for Representation of Production Facilities (Digital Factory)
	ISO 17506	COLLADA - defines an open standard XML schema for exchanging digital assets among various graphics software applications
	PLC Open XML	The standard allows the representation of control logics for programmable Logic controllers based on XML technologies
	CMSD	Core manufacturing Simulation
	IEC 62337	Commissioning of electrical, instrumentation and control systems in the process industry - Specific phases and milestones.
	ISO 15746	Defines information models for advanced process control and optimization capabilities for manufacturing systems.
	IEC 61987	Industrial-process measurement and control - Data structures and elements in process equipment catalogues
Building/facility Domain	ISO 10303-225/227	225 - Building elements using explicit shape representation 227 - Plant spatial configuration
	ISO 16739	Industry Foundation Class (IFC) - Building information modeling standard developed by buildingSMART (formerly the International Alliance for Interoperability, IAI) to facilitate interoperability in the architecture, engineering and construction (AEC) industry

data-interface specification for efficient exchange of manufacturing lifecycle data in a simulation environment. PLC Open XML provides standards to represent programmable logic control (PLC) including sequences of actions, internal behavior of objects, and Input/Output (IO) connections. IEC 62337 defines specific phases and milestones in the commissioning of electrical, instrumentation, and control systems in the process industry. IEC 61987 defines a standard to facilitate understanding of process measurement and control equipment descriptions when transferred from one party to another.

Production system engineering standards can interconnect engineering tools from different disciplines, e.g., system engineering, mechanical plant engineering, electrical design, process engineering, process control engineering, Human Machine Interface (HMI) development, PLC programming, and robotic programming. In the production system engineering category, there are several important standards playing critical roles in improving production system engineering efficiency, as shown in Table 8. While most of these standards serve very specific functions, two of them are fundamental methods, which underpin much of the work in production system engineering. The Systems Modeling Language (SysML) [38] from OMG is a general-purpose modeling language for systems engineering applications. It supports the specification, analysis, design, verification, and validation of a broad range of systems and systems-of-systems, and is particularly useful for large-scale projects such as production systems. Modelica [92] is an object-oriented, declarative, multi-domain modeling language. Modelica is widely used in applications that model complex physical systems and particularly to model the mechanical, electrical, electronic, hydraulic, thermal, control, electric power, or process-oriented subcomponents of production systems.

In the production system automation engineering area, IEC 61131 is a widely adopted standard for programmable controllers, including equipment requirements and tests, communication, functional safety, programming languages, and their implementation guidelines. Specifically, IEC 61131-3 is the most widely adopted standard defining the programming languages for PLCs, embedded controls, and industrial personal computers (PCs). IEC 61499 is an open standard for distributed control and automation, upon which entire applications can be built from Function Blocks (FB) with event triggers. This standard has not been accepted by industry, even though it is highly promoted by the academic community, because it does not provide a solid framework for the next generation of industrial automation systems [54]. IEC 61804 defines FB for process control. IEC 62714, AutomationML, interconnects engineering tools from different disciplines, e.g., mechanical plant engineering, electrical design, process engineering, process control engineering, HMI development, PLC programming, and robotic programming, etc. [12]. AutomationML incorporates different standards through strongly typed links across the formats including CAEX (IEC 62424) for properties and relations of objects in their hierarchical structure, COLLADA for Graphical attributes, and Kinematics and PLCopen XML for logic items. IEC also has a set of standards to model and configure production equipment, such as IEC 62453-2 for field device tool interface specification, and IEC 61804-3 specifying Electronic Device Description Language (EDDL). ISO 18828 is under development by ISO TC184/SC4 for standardized procedures for production systems engineering.

For production engineering practice, IEC 61508 is the international standard for electrical, electronic, and programmable electronic safety-related systems. It specifies requirements for ensuring that systems are designed, implemented, operated, and maintained to standards for safety integrity levels (SIL). IEC 61511 is a technical standard that specifies practices in the engineering of systems that ensure the safety of an industrial process through the use of instrumentation. This standard is process-industry specific within the framework of IEC 61508. ISO 13849 provides safety requirements and guidance on the principles for the design and integration of safety-related parts of control systems, including the design of software.

Table 8: Production System Engineering standards

Standard	Description
SysML	Systems Modeling Language (SysML) dialect of the Unified Modeling Language (UML) for systems engineering applications owned by OMG.
Modelica	Modelica® is a non-proprietary, object-oriented, equation based language to conveniently model complex physical systems containing managed by Modelica Association
IEC 61131	An IEC standard for programmable controllers.
IEC 61499	An open standard for distributed control and automation based on basic building blocks from which entire applications may be built.
IEC 61804	Function blocks (FB) for process control Part 2: Specification of FB concept Part 3: Electronic Device Description Language (EDDL)
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems.
IEC 61511	Safety instrumented systems for the process industry sector ;
ISO 13849	Safety of machinery -- Safety-related parts of control systems
IEC 62714	Automation ML - Engineering data exchange format for use in industrial automation systems engineering.
IEC 62453	Field device tool (FDT) interface specification
ISO 18828	Standardized procedure for production systems engineering in development

Production lifecycle data management standards define general models of data integration, sharing, exchange, and hand-over for lifecycle support of production facilities. A selected set of important production lifecycle data management standards are shown in Table 9. A study of information modeling [53] found that ISO 10303 AP 239 (PLCS) has the most potential to model a manufacturing system for its lifecycle. However, guidance is needed regarding how to use PLCS for representing domain-specific objects such as machining centers [90]. ISO 15926 is the most widely used production lifecycle data management standard in the process industry. ISO 15926 -1 defines a class structure of various phenomena or occurrences that exist in time and space in that industry.

Table 9: Production lifecycle data management standards

Standard	Description
ISO 10303-239	Product lifecycle support
ISO 15926	Industrial automation systems and integration -- Integration of lifecycle data for process plants including oil and gas production facilities
ISO 16739	Industry Foundation Class (IFC) - Building information modeling standard developed to facilitate interoperability in the architecture, engineering and construction (AEC) industry
IEC 62890	Lifecycle management for systems and products used in industrial-process measurement, control and automation

Due to the generic character of the PLCS data model in 15926, the 15926 standard defines a reference data model in Part 4 providing more useful entities for representing process plants. ISO 16739 defines a common data model for building lifecycle support that can be applied to manufacturing facilities. The emerging IEC 62890 defines standards for lifecycle management for systems and products used in industrial process measurement, control and automation.

O&M standards define data processing, communication, and presentation standards for condition monitoring and diagnostics of machines, for maintaining the adequate performance of the system, and for searching ways to improve performance. Table 10 shows a selected set of O&M standards. Standards supporting production O&M include MIMOSA Open Systems Architecture for Enterprise Application Integration (OSA-EAI) specifications and condition-based maintenance (CBM) specifications, which are widely used in the Oil and Gas industry. ISO 13374 also defines data processing, communication, and presentation standards for condition monitoring and diagnostics of machines. The upcoming ASME B5.59-2 will address performance and capabilities of machine tools at any time in their lifecycles, e.g., during specification, after acceptance testing, or during operation. ASME B5.59-2 addresses only information related to the machine tool itself and does not include process-related information [53].

Table 10: Production System O&M Standards

Standard	Description
ISO 13374	The standard establishes general guidelines for software specifications related to data processing, communication, and presentation of machine condition monitoring and diagnostic information.
MIMOSA OSA-CBM	The Open System Architecture for Condition-Based Maintenance (OSA-CBM) specification is a standard architecture for moving information in a condition-based maintenance system.
MIMOSA OSA - EAI	Open System Architecture for Enterprise Application Integration (OSA-EAI) specification provides an information exchange standard to allow sharing information between enterprise systems and a relational database model to allow storage of the same asset information.
ASME B5.59.2M	Information Technology for Machine Tools Part2 – Data Specification for Properties of Machine Tools for Milling and Turning

3.4 Business Cycle for Supply Chain Management

Electronic commerce is critical today to enable any type of business, or commercial transaction, and always involves information exchange between stakeholders. Figure 4 shows the Plan-Source-Make-Deliver-Return cycle for managing the manufacturing supply chain. Standards for interactions among manufacturers, suppliers, customers, partners, and even competitors include general business modeling standards (shown in Table 11), and manufacturing specific modeling standards and corresponding message protocols. These standards are the key to enhancing supply chain efficiency and manufacturing agility. Here, we highlight three sets of manufacturing-specific standards critical for integration: APICS Supply Chain Operations Reference (SCOR), Open Applications Group Integration Specification (OAGIS), and MESA's B2MML.

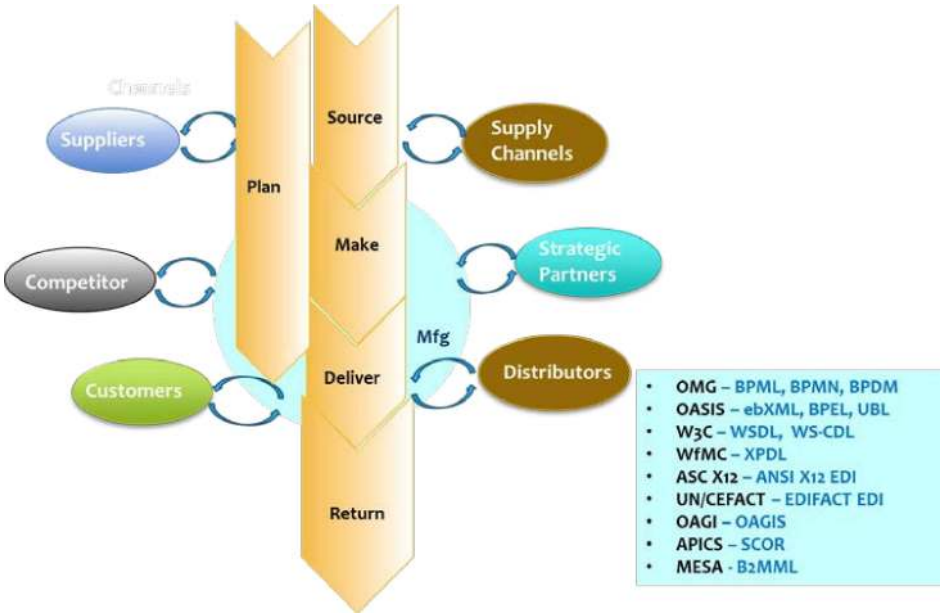


Figure 4: Standards through the supply chain cycle

Table 11: General standards employed for modeling and executing business processes

SDO	Standards	Description
OMG	BPMN	Business Process Modeling Notation- A standardized graphical notation for drawing business processes which also defines a metamodel and interchange format
	BPDM	Business Process Definition Metamodel - Provides abstract concepts to express business process models
WfMC	XPDL	XML Process Definition Language - business process models that addresses both the graphics and the semantics and can be executed, stored, and exchanged
OASIS	ebXML	Electronic Business XML - uses the Extensible Markup Language (XML) to standardize the secure exchange of business data
	BPEL	An orchestration language for specifying business process behavior based on Web Services; XML-based business process models that can be executed, stored, and exchanged
	UBL	A generic XML interchange format for business documents that can be customized to meet the requirements of particular industries
W3C	WSDL	WSDL is an XML format for describing network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information.
	WS-CDL	Web Services Choreography Description Language - describes interoperable, peer-to-peer collaborations between participants
ASC X12	ANSI X12	One of the most widely adopted Electronic Data Interchange (EDI) document standards developed by ANSI chartered the Accredited Standards Committee (ASC) X12
UN/ CEFACT	EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport - an international EDI standard developed by the United Nations.
OAGi	OAGIS	XML based specifications for defining business messages, and for identifying business processes (scenarios) that allow businesses and business applications to communicate
APICS	SCOR	A supply chain framework, linking business processes, performance metrics, practices and people skills into a unified structure
MESA	B2MML	An XML implementation of the ANSI/ISA-95, Enterprise-Control System Integration

SCOR is a process reference model from the Supply Chain Council (SCC) (now part of APICS) and is a de facto standard that identifies and promotes best practices in the management and operation of supply chain activities across many industries [13]. SCOR is a management tool spanning the supply chain from the supplier's suppliers to the customer's customers. The model describes the business activities associated with all phases of satisfying a customer's demands. The model uses an approach based on three pillars: process modeling and re-engineering, performance measurements, and best practices. The SCOR model is text-based and, therefore, not directly usable for automation.

OAGIS includes a suite of engineering and business message specifications called Business Object Documents (BODs), which define common content models and messages for communication between business applications. OAGIS also defines guides for implementation. OAGIS content spans many industries and functions, including electronic commerce, manufacturing, logistics, Customer Relationship Management, and Enterprise Resource Planning (ERP.) It includes not only specific formats for common types of messages used in manufacturing domains, but also mechanisms for extending and tailoring the standards for specific needs. The standard can serve as building blocks for customized data exchanges. MESA B2MML is a well-adopted implementation of the ISA 95 data models. It facilitates the integration of ERP and supply chain management systems with manufacturing systems such as control systems and MES.

3.5 MANUFACTURING PYRAMID

The Manufacturing Pyramid is the core of the SM Ecosystem and is where the product lifecycle, production lifecycle, and business cycle converge and interact. In a smart operation, autonomous and intelligent machine behaviors—including self-awareness, reasoning and planning, and self-correction—are key, but information resulting from these behaviors must flow up and down the Pyramid. This integration from machine to plant to enterprise systems is vital and critically depends upon standards. Standards-enabled SM integration allows 1) access to field and plant data for making quick decisions and optimizing production throughput and quality, 2) accurate measures of energy and material use, and 3) improved shop floor safety and enhanced manufacturing sustainability.

In Figure 5, we divide integration standards based on the ISA 95[34] hierarchy, which has also been included within ISO/IEC 62264 [30]. ISA 95 is a commonly used reference model for developing automated interfaces between enterprise and control systems. This standard was developed for global manufacturers and designed for applicability to all industries and for batch, discrete, and continuous processes alike.

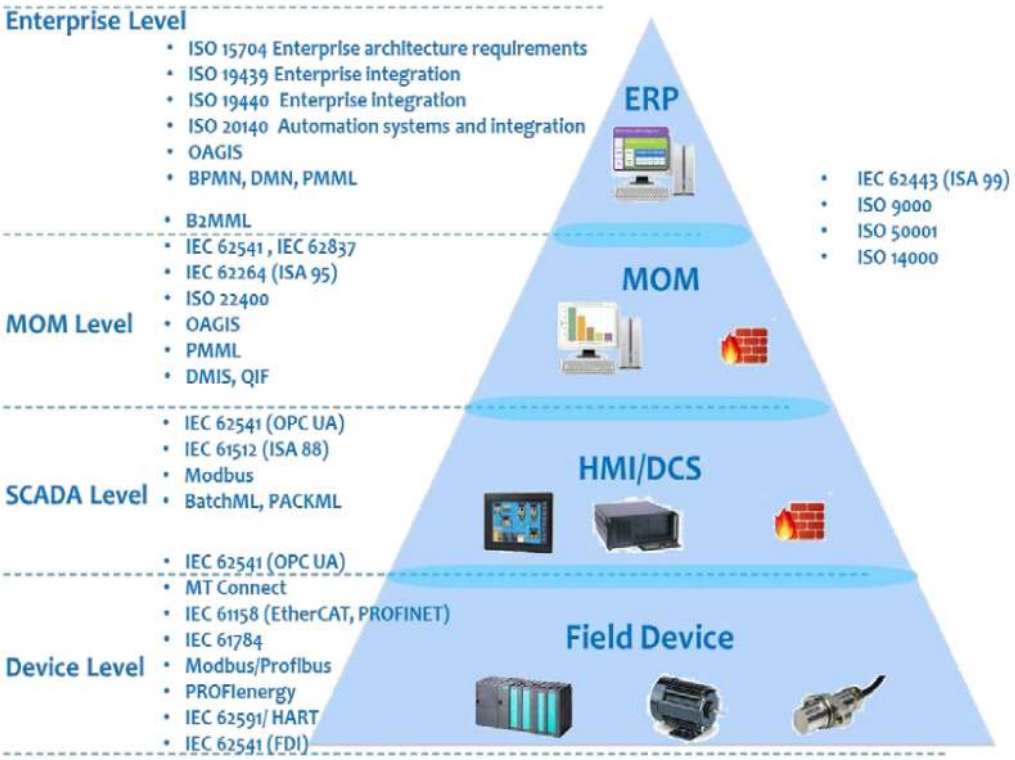


Figure 5: Standards aligned to the ISA95 model

Table 12: Enterprise level standards

Standards	Description
ISO 15704	Industrial automation systems -- Requirements for enterprise-reference architectures and methodologies
ISO 19439	Enterprise integration—Framework for enterprise modelling, provides a unified conceptual basis for model-based enterprise engineering that enables consistency, convergence and interoperability of the various modelling methodologies and supporting tools.
ISO 19440	Enterprise integration -- Constructs for enterprise modelling, specifies the characteristics of the core constructs necessary for computer-supported modelling of enterprises conforming to ISO 19439.
ISO 20140	Automation systems and integration -- Evaluating energy efficiency and other factors of manufacturing systems that influence the environment
OAGIS	Open Applications Group Integration Specification (OAGIS) defines a common content model and common messages for communication between business applications including application-to-application (A2A) and business-to-business (B2B) integration.
DMN	Decision Modeling Notation (DMN) from OMG provides the constructs that are needed to model decisions to close the gap between the business decision design and decision implementation. DMN notation is designed to be useable alongside the standard BPMN business process notation.
PMML	The Predictive Model Markup Language (PMML) is an XML-based file format developed by the Data Mining Group to provide a way for applications to describe and exchange models produced by data mining and machine learning algorithms. It supports common models such as logistic regression and feedforward neural networks..

Enterprise level: Table 12 shows important enterprise-level manufacturing standards. ISO 15704 defines requirements for enterprise reference architectures and methodologies. The ISO standards 19439 and 19440 listed in Figure 5 define the framework and specify characteristics of the core constructs needed for enterprise-level activities. ISO 20140 establishes an overview and general principles of a method for assessment of environmental influence of manufacturing systems. OMG's Business Process Model Notation (BPMN) is a graphical representation often used for specifying processes in a manufacturing business process model. The Predictive Model Markup Language (PMML) developed by the Data Mining Group (DMG) [93] is a format to define statistical and data mining models. PMML can be adopted at the MOM level as well. The Decision Model and Notation (DMN) standard is being developed by OMG to close the gap between business decision design and decision implementation. OAGIS defines a common content model for enterprise application integration.

MOM level: Manufacturing operations management, or MOM, refers to applications that control plant level operations. Table 13 shows some important MOM level standards. IEC 62264 is an international standard for enterprise control system integration and is based upon ISA 95. IEC 62264 defines activity models, function models, and object models in the MOM domain. Business to Manufacturing Markup Language (B2MML), published by the MESA, is an implementation of IEC 62264 to link ERP and Supply Chain Management (SCM) systems with manufacturing systems such as Manufacturing Execution Systems (MES). ISO 22400 defines key performance indicators (KPIs) used in manufacturing operations management. QIF is a suite of standards enabling the flow of information within computer-aided quality measurement systems. PMML from DMG could be applied at this level to support MOM functions.

Table 13: MOM level standards

Standards	Description
IEC 62264	Enterprise-control system integration – defines manufacturing hierarchical model, and describes the manufacturing operations management domain and its activities, the interface content and associated transactions within Level 3 and between Level 3 and Level 4 and Level 3 objects. This standard is based upon ANSI/ISA-95.
IEC 62541	OPC Unified Architecture - an industrial M2M communication protocol for interoperability developed by the OPC Foundation.
IEC TR 62837	The report on Energy efficiency through automation systems provides a framework for the development and adaptation of documents in order to improve energy efficiency in manufacturing, process control and industrial facility management.
ISO 22400	Automation systems and integration -- Key performance indicators (KPIs) for manufacturing operations management, specifies an industry-neutral framework for defining, composing, exchanging, and using key performance indicators (KPIs) for manufacturing operations management (MOM), as defined in IEC 62264-1 for batch, continuous and discrete industries.
DMIS	Dimensional Measuring Interface Standard (DMIS) is to provide a standard for the bi-directional communication of inspection data between computer systems and inspection equipment.
QIF	QIF is a unified XML framework standard for computer-aided quality measurement systems. It enables the capture, use, and re-use of metrology-related information throughout the PLM/PDM domain

SCADA and Device level: SCADA-level (Supervisory Control And Data Acquisition) and device-level standards in Figure 5 are considered shop floor standards. While these levels were once more distinct, the distinction of interest now is between time and safety critical activities and non-time-critical activities. At shop floor level, there is usually an organized hierarchy of control systems consisting of HMI, PLC, and field components such as sensors and actuators. PLCs are usually connected to HMI via a non-time-critical communications system such as

Ethernet/IP, DeviceNet, ControlNet, PROFINET, and EtherCAT. A fieldbus, such as PROFIBUS, CAN bus, HART and Modbus, links the PLCs to the field components. A serial communications protocol, Modbus is also often used to connect a supervisory computer with a remote terminal unit (RTU) in SCADA) systems. While communication profiles of real-time Ethernet-based protocols like EtherCAT, PROFINET and Ethernet/IP are captured by IEC 61874, fieldbuses such as Foundation Fieldbus and PROFIBUS are specified in IEC 61158.

In addition to the communication protocols discussed above, there are several important integration standards linking shop floor control to MES and enterprise level systems, such as OPC and OPC UA (Unified Architecture), MTConnect, PackML and BatchML. OPC UA is an industrial machine-to-machine communication protocol based on Service-Oriented Architecture (SOA). Furthermore, OPC UA provides a flexible information model framework for creating and exposing customized information in a standard way, in those cases where users of OPC UA have agreed on the customizations. Some of these customizations are contained in companion standards for different application areas—for example OPC UA for ISA 95, OPC UA for Field Device Integration (FDI), OPC UA for Analyzer Devices (ADI), and OPC UA for PLCOpen (IEC 61131-3). MTConnect is used to access real-time data from shop floor manufacturing equipment such as machine tools. ISA 88 is a standard for the batch processing industry, and defines the physical model, procedures, and recipes. It was adopted by the IEC in IEC 61512. PackML is a packaging standard used in the batch processing industry as part of ISA 88 standards. BatchML is an implementation of ISA 88 for linking batch control systems to MES. The standards supporting shop floor level manufacturing systems are shown in Table 14.

Table 14: SCADA and device level standards

Standards	Description
IEC 61512	ISA-88 - defines terminology, reference models, data models (including recipe model) for batch control as used in the process industries.
BatchML	BatchML is an XML implementation of the ISA-88
PackML	Packaging Machine Language, defines a common approach, or machine language, for automated machines. PackML was adopted as part of the ISA88 industry standard in August 2008.
IEC 62541	OPC Unified Architecture - an industrial M2M communication protocol for interoperability developed by the OPC Foundation.
IEC 61158	The standard specifies industrial communication networks – Fieldbus including ControlNet and Profibus.
IEC 61784	This standard defines a set of protocol specific communication profiles based on the IEC 61158 series and real-time ethernet communication profiles. to be used in the design of devices involved in communications in factory manufacturing and process control.
ISO 11898	Controller Area network (CAN) -a serial communication protocol that supports distributed real-time control and multiplexing for use within road vehicles
IEC 62591	The standard specifies Wireless communication network and communication profiles – WirelessHART.
MTConnect	MTConnect is a lightweight, open, and extensible protocol designed for the exchange of data from shop floor equipment to software applications used for monitoring and data analysis.
IEC/PAS 62030 (Modbus)	Modbus is a de facto standard providing serial communications protocol to connect industrial electronic devices; Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU)/PLC in supervisory control and data acquisition (SCADA) systems.
MQTT	An extremely lightweight publish/subscribe messaging transport for connections with remote locations where a small code footprint is required and/or network bandwidth is at a premium.

Cross-levels: As shown on the right side of Figure 5, several standards cross all the levels and define manufacturing system security, quality management processes, energy management, and environmental management. Table 15 lists several cross-level manufacturing standards. ISA/IEC-62443, formerly ISA 99, is a series of standards, technical reports, and related information that defines procedures for implementing electronically secure industrial automation and control systems. The concept of manufacturing and control systems electronic security is applied in the broadest possible sense, encompassing all types of plants, facilities, and systems in all industries. The ISO 9000 family of quality management systems standards is designed to help manufacturers ensure that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to a product. ISO 50001 specifies the requirements for establishing, implementing, maintaining and improving energy management systems for a manufacturing business. ISO 14000 is a series of environmental management standards containing guidance on how to systematize and improve environmental management efforts.

Table 15: Cross-level standards

Standards	Description
IEC 62443 (ISA 99)	IEC-62443 defines procedures for implementing electronically secure Industrial Automation and Control Systems (IACS).
ISO 9000	ISO 9000 is a quality management standard that presents guidelines intended to increase business efficiency and customer satisfaction.
ISO 50001	The standard specifies the requirements for establishing, implementing, maintaining and improving an energy management system, to improve organizations energy performance, including energy efficiency, energy security, energy use and consumption
ISO 14000	The ISO 14000 family of standards provides practical tools for companies and organizations of all kinds looking to manage their environmental responsibilities.

3.6 Standards Adoption and the Related Issues

Standards play a big role in economic growth globally. Roughly, 80% of global merchandise trade is affected by standards and by regulations that embody standards [84]. In the United States, the economic impact of standards is not tracked [85]. Based on a UK study published in 2005, the Empirical Economics of Standards, standards make an annual contribution of 2.5 billion to the UK economy and 13% of the growth in labor productivity is attributed to the role of standards [86]. A study of the economic benefits of standardization undertaken by the German Institute for Standardization (DIN) and the German Federal Ministry of Economic Affairs and Technology from 1997-2000 based on 700 companies found the benefit of standards to the national economy is greater than $15 billion per year [87]. They also found that companies that participate in standards development have a head start on their competitors in adapting market demands and new technologies.

Standards are key enablers for manufacturing. They provide a basis on which to bring together specialized expertise to create highly efficient manufacturing systems. The sum total of standardization efforts in the manufacturing field is immense. Standards provide data definitions, detailed models of the information relationships, and interface protocols for all three of the lifecycles we describe. They support product designs and management, production system design and operations, and integration into business value chains. These

are the foundations on which information can flow throughout the levels of manufacturing control and between partners in the manufacturing enterprise including the various software vendors and device providers that participate by providing their expertise to these systems in the form of commercial products. Standards allow for a clear separation of concerns among the participants, effectively bringing down costs while increasing reliability and efficiency.

Across some of the lifecycles and in some industry sectors standards are more mature than in others. In discrete manufacturing, which is characterized by individual parts that are assembled into final products, standards along the product lifecycle are fairly well positioned to support Smart Manufacturing. In the world of continuous manufacturing, however, standards are not as well established for process product data management. Production systems engineering standards are more diversified and can typically be applied in both categories of manufacturing. Within the manufacturing pyramid, communication standards are well established but interoperability among systems is somewhat limited, meaning that manufacturers typically are locked into a single vendor solution. Along the business lifecycle, several well-established standards exist however; the level to which information is able to interconnect with the production systems is quite limited. Other gaps in the ability of standards to address smart manufacturing needs exist and are discussed in detail in next section.

Beyond the standards gaps two other barriers to standards adoption inhibit the growth of SMS.

1) Lack of tracking of standards and standards adoption. The huge number of standards can be misleading, as many standards are never used. The number of standards that are actively being sold constitute a small part of those offered for sale, meaning many standards out there are not being used. In 1996, a NIST report identified 25-30% of the US standards as obsolete [83] and certainly, this number has grown. SDOs rarely inactivate standards once they have been published. The result is that manufacturers and their support network, in the form of software and device providers, are left trying to navigate the standards without a compass to help them find their way.
2) Overlap and redundancy between standards. Three practices cause overlap and redundancy. First standards from national, regional, international standards systems are sometimes identical, equivalent or in some other way related resulting in confusion as to the most authoritative source. Secondly, standards in the same technical areas but in different application sectors are defined independently. For example, material-testing methods defined for different industry sectors sometimes are not consistent. For the US, the third redundancy comes from the pluralistic standards system. In a pluralistic standards system, no one body is sanctioned to provide standards. The system reflects cultural individualization and an in-grained belief in a market-driven economy. In US, there are 600 SDOs maintaining ongoing standardization programs. As the number of standards produced expands, more opportunity for overlap and redundancy results. Standards organizations are not only competing with one another to write standards, they are sometimes writing conflicting standards, thus defeating the purpose. In the words of an old programmer, “Are we creating spaghetti code in our standards?”

To tackle the issues of untracked and overlapping standards, harmonization and collaboration among SDOs are necessary. Harmonized standards as defined by ISO are “equivalent standards on the same subject approved by different standardization bodies that establish interchangeability of products, processes and services, mutual understanding of test results or information provided according to these standards" [94].

Historically, there have been several attempts at standards harmonization. The first international harmonization occurred when ISO was formed in 1947. Before the World War II, standards throughout the world were national in scope, often set by government-funded national standards bodies. Standards were developed to serve a

country's particular needs and to benefit the domestic supplier. However, standards for similar products approved by different national standards bodies create difficulties for global companies. Trade barriers result in that products designed for one market may be blocked out of other markets based on the different national requirements. ISO was created to facilitate trade by opening up the markets globally [91]. We now see a trend for many SDOs to be global. Many of the organizations we have mentioned have evolved into international organizations from their national origins, often dropping the original meanings of their acronymized names at the same time. In the US government policy shifted away from government specific standards (known as Federal Information Processing Standards or FIPS and United States Military Standards or MILSPECS) to adopting publically developed standards from SDOs. A decade ago, 80% of all standardization activities of the European standards bodies focused on national work, with the remainder related to international development efforts. Today, this ratio is reversed: 80% of standards work is international [88]. Where overlap exists between standards organizations, it is typical to have at least a liaison that is responsible for mediating differences. SDOs will often establish joint working groups as well.

To summarize, in this age of smart manufacturing demands for further standards harmonization and a proactive way to develop and implement ubiquitous standards are greater than ever before. For manufacturers to embrace emerging information and communication technology, serve global markets and innovative business models, and provide rapid evolutions of product designs and new technology, strong standards underpinnings that are clear and unambiguous are needed. The standards landscape presented here identifies areas of technical interaction between the different standards efforts.

4 STANDARDS OPPORTUNITIES FOR SMART MANUFACTURING

Most standards for manufacturing created in the last 30 years have already achieved a high degree of maturity; however, to enable SMS, further standards development is necessary. We identify several areas in the SM Ecosystem where standards can be extended or where new standards should be developed, and we identify some new initiatives focused on SMS that will spur the development of both SMS technology and standards.

4.1 STANDARDS NEEDS

Full realization of SMS capabilities will require replacement of the classical manufacturing system architectural paradigm based on a hierarchical control model [45]. Figure 6 shows a new paradigm based on distributed manufacturing services, also called Cyber Physical Production Systems (CPPS).[8] The paradigm shift is made possible by the introduction of smart devices accessible as services on a network, more embedded intelligence at every level, predictive analytics that enable responsive control, and cloud technology that enables virtualization of control and engineering functions at all hierarchical levels. With these capabilities in place, widespread automation across hierarchical levels using new approaches to control is a realistic possibility.

[8] Smart devices are at the core of the area of technology development that has become known as Cyber Physical Systems, or CPS, of which CPPS is a part.

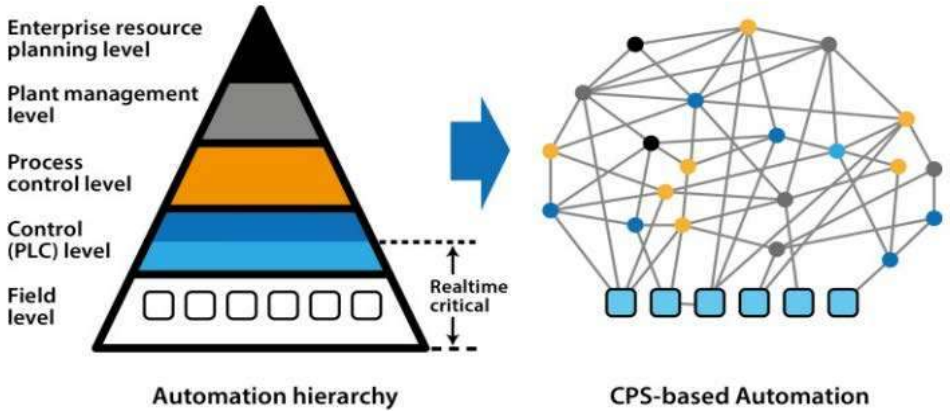


Figure 6: Decomposition of the automation hierarchy with distributed services [55]

The new service-oriented paradigm ultimately transforms the smart manufacturing ecosystem into a fully connected and integrated system, shown in Figure 7. All the manufacturing functions along three dimensions and in the manufacturing pyramid can be virtualized and hosted as services, except those time-critical and safety-critical manufacturing functions remaining at the shop floor level.

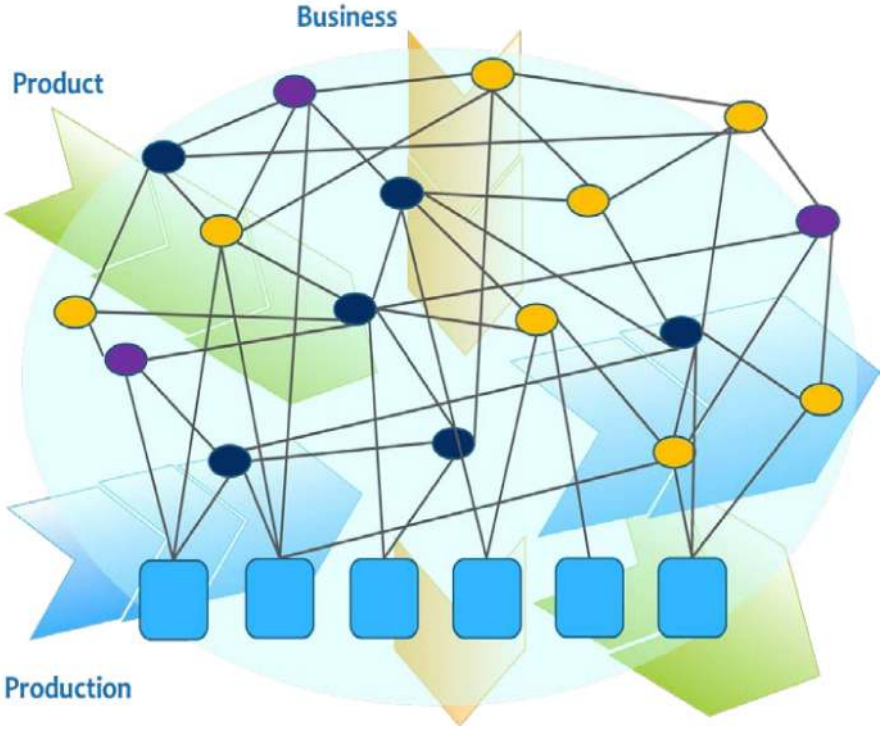


Figure 7: Service-oriented smart manufacturing ecosystem

Existing manufacturing standards are far from being sufficient for the service-oriented smart manufacturing ecosystem. Areas that need new standards support include reference architecture, cybersecurity, factory networking, supply chain integration, and data transfer from factory floor to enterprise level. Table 16 lists these standards' opportunities and the types of capabilities they support. Specifically, new or improved standards in

these areas would improve capabilities associated with agility (A), quality (Q), productivity (P) and sustainability (S). The first column is the area of opportunity for new standards. The second column shows where the standards impact the SM Ecosystem—Product Lifecycle (PL), Production System Lifecycle (PSL), Business Cycle (BC), and Smart Production Pyramid (SPP). The third column shows how the standards map to SMS capabilities. Note that we present this not as a complete list, but rather as a starting point for exploration and discussion of the infrastructure of SM standards.

Table 16: Opportunities for Standards for SM Capabilities

Standards Opportunity	Eco System Dimension				Capability Supported			
	Product Lifecycle	Production Lifecycle	Business Cycle	Mfg Pyramid	Agility	Product ivity	Quality	Sustain-ability
Cyber Security	X	X	X	X	X	X	X	
SMS Reference Model and Reference Architecture	X	X	X	X	X	X	X	X
CPPS Reference Architecture		X		X	X		X	X
Smart Device Information Model		X		X	X	X		
Intelligent Machine Communication Standards				X	X	X	X	X
Human Machine Interface		X		X	X	X	X	
PLM/MES Integration	X	X		X	X	X	X	X
Cloud Manufacturing	X	X	X	X	X	X		
Manufacturing Sustainability	X	X	X	X				X

As shown in the table, a high-level reference architecture for SMS, including functional models and architectural definitions, is needed to integrate functions within and across the extended enterprise, including between suppliers and customers. These models will form the basis for dynamic production capabilities and customization of end products.

Information models representing smart devices on the shop floor and manufacturing services are also needed to increase productivity and agility by supporting reconfiguration of equipment, as well as allowing more optimal health maintenance. A reference architecture for CPPS will enable development of production modules incorporating smart devices. As these systems of systems come into place, intelligent machine communication standards along with an architectural framework will allow automation of system-level controls and transparency of data from the lowest levels of manufacturing to higher control levels.

This increase of automation possibilities brings a need for new types of interfaces for humans to interact with the machines. Much of the performance data for individual machines can be presented to people through dashboards that also enable direct control. Similarly, dashboards for monitoring and controlling system-wide performance are needed. Optimization of these interfaces is an area of active research, and related standards should accordingly follow. ISA formed an HMI committee to establish standards, recommend practices, and

provide technical reports relating to human-machine interfaces (HMIs) in manufacturing and processing applications.

In addition, for production system design, operational data from manufacturing is needed to generate new designs and better process plans more quickly. Although it is an area of research, no explicit standards yet exist to assess production system capabilities and to link the results back to upstream activities in the lifecycle.

For product lifecycle management, AMP 2.0 [5] recommends an ontology of data and artifacts that captures, stores, visualizes, searches, and shares both static and dynamic data, both along the product lifecycle and through the supply chain. The development of such a standard will enable more agility in the supply chain and reuse of products designs for rapid redesign.

Product lifecycle data combined with data from manufacturing processes can enable advanced analyses of the processes themselves, resulting in process improvement in terms of productivity, sustainability, and quality. For instance, analysis of product performance in the field can sometimes reveal quality issues in production.

One vision for SMS is that products themselves can contain the history of how, when, and where they were manufactured. The MTConnect Institute is starting standards activities that will enable this type of traceability. Technology and standards for big data and cloud manufacturing will allow many types of advanced analysis and other functions to be provided on a service basis, thereby making them more readily accessible to manufacturers.

Standards related to sustainability evaluation for manufacturing systems are evolving along each of the dimensions described. Current practices for sustainability evaluation for manufacturing follow the Life Cycle Assessment (LCA) methodology standardized in the ISO 14000 series on environmental management. These standards operate from a management perspective and use a top-down approach to estimating sustainability impacts of different processes involved in goods production. In SMS, we envision more accurate measures of the sustainability impacts of each of the manufacturing processes based on measures of operational data for each process. These measures will allow more accurate accounting of the impacts of individual decisions at each production facility. Still, many challenges will exist since sustainability assessment, by its very nature, must address tradeoffs between many criteria. How this data can be used along each of the dimensions of the SMS ecosystem and how sustainability impacts are apportioned to the different aspects of production and the product are grand challenges for sustainability assessment. Standards are necessary to provide unambiguous and comparable data to support this decision-making process.

4.2 New Initiatives

Most of the standards areas that we described are being extended to address SMS capabilities. Quite a few new initiatives worldwide have emerged to contribute to the standards and opportunities identified above.

4.2.1 Industrie 4.0

Industrie 4.0 is a key initiative in Germany containing a technical strategy for achieving SMS. The enablers of Industrie 4.0 are the internet, mobile computing, and cloud computing technologies. A goal of Industrie 4.0 is the creation of innovations including smart products, smart production systems, smart factories, and smart logistics running in a decentralized and dynamic fashion [56]. The Industry 4.0 working group recommended standardization and open standards for a reference architecture as the first priority for implementation [57]. Following this recommendation, the German Commission for Electrical, Electronic & Information Technologies (DKE) produced a standardization roadmap in 2014 [17]. In parallel, Platform Industrie 4.0 projects were established by a number of German associations to form interdisciplinary working groups on issues for future

standardization. The result is the Reference Architectural Model (RAMI) 4.0 and the Industrie 4.0 components [58] that describe functional models for CPPS. These will serve industry as a basis for developing future products and business models in Germany.

4.2.2 Internet of Things (IoT)

In the area of the Internet of Things (IoT), the Europe Union (EU) founded several projects to develop an IoT reference model and reference architecture. IoT-A, an EU Seventh Framework Project, created an architectural reference model envisioned as a foundation for the Internet of Things [62]. IoT@Work is another EU project led by Siemens AG that focuses on harnessing IoT technologies in industrial and automation environments [63]. Three main scenarios providing requirements for the IoT@Work architecture include agile manufacturing, large-scale manufacturing, and remote maintenance.

In the U.S., the Industrial Internet Consortium (IIC) [36] founded by GE, IBM, CISCO, Intel, and AT&T is a transatlantic cousin of Industrie 4.0. IIC is concerned with anything that can be connected to the internet, provide data as feedback, and raise efficiency. Its scope is larger than Industrie 4.0 in that it addresses not only manufacturing systems, but also energy, healthcare, and infrastructure. Unlike Industrie 4.0, which works on standards directly, IIC has set a goal to "define and develop the reference architecture and frameworks necessary for interoperability" and which might help set future standards. Table 17 shows a comparison between Industrie 4.0 and IIC from [60].

Table 17: Comparison of Industrie 4.0 and the Industrial Internet Consortium [60]

	Industry 4.0	The Industrial Internet Consortium
Key authors	German government	Large multinationals
Key stakeholders	Government, academia, business	Business, academia, government
Taxonomy of revolutions	Four revolutions	Three revolutions
Support platforms	German industrial policy	Open membership non profit consortium
Sectoral focus	Industry	Manufacturing, energy, transportation, healthcare, utilities, cities, agriculture
Technological focus	Supply chain coordination, embedded systems , automation, robots	Device communication, data flows, device controls and integration, predictive analytics, industrial automation
Holistic focus	Hardware	Software, hardware, integration
Geographical focus	Germany and its company	Global marketplace
Corporate focus	SMEs	Companies of all sizes
Optimization focus	Production optimization	Asset optimization
Standardization focus	On agenda	Recommendations to standards organizations
Economic approach	Normative economics	Positive economics
Overall Business approach	Reactive	Proactive

Meanwhile, the Open Interconnect Consortium (OIC), founded by leading technology companies like Samsung, Cisco, GE, and Intel, is proposing an open-source solution to enable device-to-device connectivity for IoT [61]. OIC focuses on building a common communications standard and sponsors the IoTivity project to build an open-source reference implementation of those specifications. The adoption of the OIC standard is expected to begin in consumer electronics and expand over time to industrial applications.

Open Machine communication standards are one of the key enablers of IoT implementation. The diversified IoT use scenarios mean that there will be no single 'winner' in terms of Machine-to-Machine (M2M) standards. Initiatives such as OneM2M [66], HyperCat [68], OMA LightweightM2M [67], Eclipse M2M [68] and Weightless [70] have potential to be de facto M2M standards [65]. Specifically, Eclipse SCADA will provide connectivity to a variety of industrial devices and offer a monitoring system to create alarms and events and record historical data and a framework to build custom user interfaces and visualizations for those functions [71]. A new ETSI (European Telecommunications Standards Institute) Technical Committee is also developing standards for M2M Communications in cellular segment for IoT applications in industrial automation, heath care, and supply chains [64].

4.2.3 Cyber Physical Systems (CPS)

While the IoT deals with unique, identifiable, and internet-connected physical objects, cyber-physical systems efforts are concerned with the nature of cyber-physical coupling and the system of systems characteristics of software-controlled systems. Standards for CPS include a reference architecture, common services and functional models, semantics, security and safety standards, and standard interfaces for system-to-system interactions. A public working group led by NIST is working on terminology and a reference architecture for CPS [72]. CPS research and standards development are being worked on in multiple NIST Laboratories in programs on advanced manufacturing, cybersecurity, buildings and structures, disaster resilience, and smart grid. NIST efforts include work on Industrial Control Systems (ICS) as well. In Europe, the EU has invested significantly in CPS through its ARTEMIS and ECSEL JU programs and Smart CPS projects under the Horizon 2020 plan [73]. The Association for German Engineers founded Technical Committee 7:20 - Cyber-Physical Systems to support standards development in CPS from the perspective of automation technology [74].

4.2.4 Big Data and Cloud Manufacturing

The amount of data in manufacturing systems is exploding. Big-data analytics enables continuous innovation and process improvement of manufacturing systems, and has been recognized as a key enabler of SMS [80]. With a cloud-computing infrastructure, manufacturers gain the ability to access software and real-time data at lower cost and to respond quicker to customer issues. The IEEE Standards Association has introduced a number of standards related to big-data and cloud applications, including IEEE 2200-2012, IEEE 6136, and IEEE P2302. ISO/IEC JTC 1 recognized data analytics as an important future area for focus and established a Study Group on Big Data to identify standards gaps and propose standardization priorities to serve as a basis for future JTC 1 work [76]. NIST established a public working group to propose a reference architecture and identify standards related to Big Data, a fundamental technology for SMS [42]. While technology development in this area will have a huge impact on manufacturing, none of these activities are specifically directed at manufacturing. In May 2015, NIST and OAGI jointly held a Workshop on Open Cloud Architectures for Smart Manufacturing [78].

4.2.5 Smart Manufacturing Initiatives in the U.S.

While most of the existing consortia and professional societies in the U.S. are addressing SMS in some ways, several industrial consortia formed to address broader, overarching, needs of SMS. The oldest of these is the Smart Manufacturing Leadership Coalition (SMLC), a non-profit organization committed to the creation of a scaled, shared, infrastructure called the Smart Manufacturing Platform [75]. SMLC activities will help set future standards in integrating SM applications. Subsequently, the U.S. government initiated a series of institutes to support U.S. manufacturing. These institutes collectively called the National Network of Manufacturing Institutes, or NNMI, address different challenge areas for advanced manufacturing. The Digital Manufacturing and Design Innovation Institute (DMDII) most closely aligns with the SMS needs for information flow throughout

an enterprise to enable the SMS capabilities—agility, quality, productivity, and sustainability. DMDII has issued three rounds of project calls in areas of strategic importance, including intelligent machine communication standards and cyber-physical manufacturing operating systems. In 2014, the U.S. Department of Energy announced intention to create another institute for clean-energy manufacturing based on smart manufacturing technology, including advanced sensors, controls, platforms, and modeling technology for energy efficiency.

The National Institute of Standards and Technology (NIST) has several initiatives addressing Smart Manufacturing. NIST is heavily engaged in efforts to develop new standards for the Digital Thread [39], Model-Based Enterprise [40], smart manufacturing design and analysis [95], additive manufacturing [97] and robotics [96]. NIST leads an effort to define requirements eventually leading to standards for cloud-based services for manufacturing. NIST work on cyber security for supply chains and industrial systems will have great importance for manufacturers [43]. Finally, NIST coordinates the networking of the NNMIs within the U.S. [44].

4.2.6 SDO Smart Manufacturing Related Activities

Various SDO activities are starting to focus explicitly on the needs for and impacts of the technologies fundamental to SMS—IoT, cloud computing, Big Data, and analytics. To help ensure the existence of adequate standards support for SM, in 2014 the IEC Standardization Management Board (SMB) set up a new Strategic Group, SG 8: Industry 4.0 – Smart Manufacturing. Its scope includes defining terminology, summarizing existing standards and standardization projects in progress, and developing a common strategy for implementation of smart manufacturing [59]. SG 8 will also foster relationships between IEC (TC3, TC 65) and institutions like ISO (TC 184), ISA, and IEEE on SM standards development. In 2015, the ISO Technical Management Board (TMB) passed a resolution to form an ISO/TMB Strategic Advisory Group on Industry 4.0/Smart Manufacturing. The SAG is tasked to provide a definition of, and give an overview on, available standards, use cases, and current work related to Industry 4.0/Smart manufacturing; to identify possible gaps where additional standards are needed; and to make recommendations on actions to be taken by TMB [82]. In the Fall of 2014, MESA launched the Smart Manufacturing Working Group to better orchestrate their projects related to Smart Manufacturing. Outputs from this group will include things such as expansion of MESA's 'Collaborative Manufacturing Dictionary' and a library of 'Manufacturing Business Processes' and 'Use Cases' that map production processes across internal operating departments and supply chains [74]. OAGI also established a Smart Manufacturing working group to develop multi-tiered supply chain collaboration guidelines and standards for engineered components to improve cost, quality, agility and more. Similarly, ASTM has established a Smart Manufacturing Advisory Board to guide their efforts.

4.2.7 Sustainable Manufacturing Standards

Typically, sustainability is discussed from three perspectives: environment, economic, and social. The focus of our study is on data and information that can be collected by a manufacturing organization rather than on organizational policies and practices. In 2008, ASTM formed a committee on Sustainability and subsequently formed a subcommittee specifically addressing Sustainable Manufacturing. While the standards of this subcommittee are not yet complete, we expect an initial set on the near-term horizon for enabling analysis of how manufacturing systems are impacting sustainability and can be improve in this respect. A focus of the ASTM standards is on characterizing manufacturing processes for environmental sustainability assessment. Sustainability is inherently a complex area in which multiple tradeoffs must be considered. In order to evaluate those trade-offs, accurate data reflecting the impact of individual activities and processing leading to the creation of some good or service is necessary. Until now, such data was very difficult and costly to obtain. Direct measure of the use of physical resources is now quantifiable and thus the focus of the standardization activities.

In addition, ISO 22400 has initiated an addendum standard on KPIs for energy management specifically. A wide range of other activities focuses on assessing social factors related to sustainability. These include organizational practices and policies and do not fall within the scope of this study. Economic aspects of sustainability are also not specifically addressed, but the data gathered for SMS will be ultimately useful in these assessments as well. For instance, when trying to understand issues of resource efficiency, one must take an economic viewpoint and factor that against measures of resource utilization.

5 CONCLUSION

In order to realize the vision of smart manufacturing, the classical manufacturing system architectural paradigm based on a hierarchical control model must be replaced. A new paradigm based on distributed manufacturing services is evolving. This paradigm shift is brought on by the introduction of smart devices accessible as services on a network, embedded intelligence at every level, predictive analytics, and cloud computing technology. All of these technologies depend on standards.

Standards are a fundamental component of the evolution to smart manufacturing. Standards allow for systematic, repeatable, and efficient manufacturing systems. Standards support the participation of a wide range of organizations from small manufacturers to large multi-national corporations. Moreover, smart manufacturing technologies enabled by standards allow for participation of a wide range of manufacturers, regardless of size or location.

This report presents an examination of the standards landscape for smart manufacturing. The landscape comprises standards used to integrate within and across three manufacturing lifecycle dimensions – the product lifecycle, the production system lifecycle, and the business (enterprise) lifecycle. In order to study existing standards and how they can be applied to smart manufacturing, we have defined a Smart Manufacturing Ecosystem to provide a consistent context for analyzing existing standards and establishing future standards requirements for smart manufacturing. In this report, the SMS Ecosystem is used as a basis to categorize and evaluate existing standards for application to smart manufacturing systems, present a comprehensive view of emerging SMS standardization activities, and identify areas where new standards activities are needed to enable the implementation of SMS.

The report concludes that existing manufacturing standards are insufficient to fully enable smart manufacturing, especially in the areas of cybersecurity, cloud-based manufacturing services, supply chain integration, and data analytics. Traditional standards development efforts, primarily focused on incremental improvements of existing standards, cannot keep pace with the speed of evolving technology. SDOs, national manufacturing initiatives, and industrial consortia are identifying requirements for new smart manufacturing standards.

The report identified the following as priority areas for standards advancement to enable smart manufacturing:

- SMS reference model and reference architecture
- Internet of Things (IoT) reference architecture for manufacturing
- Manufacturing service models
- Machine to machine communication
- PLM/MES/ERP/SCM/CRM integration

- Cloud manufacturing
- Manufacturing sustainability
- Manufacturing cybersecurity

Finally, the report examined sources of new requirements for standards to support smart manufacturing, including national and international manufacturing initiatives, the Internet of Things initiative, standards development organization manufacturing programs, and the emergence of sustainable manufacturing requirements.

6 REFERENCES

[1] Global Agenda Council on the Future of Manufacturing , The Future of Manufacturing: Driving Capabilities, Enabling Investments, URL: http://www.cggc.duke.edu/pdfs/Future_of_Manufacturing_Driving_Capabilities.pdf, Access date March 14, 2015

[2] S. S. Shipp, N. Gupta, B. Lal, J. A. Scott, C. L. Weber, M. S. Finnin, M. Blake, S. Newsome, and S. Thomas, 2012, Emerging global trends in advanced manufacturing, Institute for Defense Analyses, Virginia, US.

[3] J. Davis' T. Edgar, J. Porter, J. Bernaden, M. Sarli, Smart Manufacturing, manufacturing intelligence and demand-dynamics performance. *Computers & Chemical Engineering*, 2012, **47**,145-156.

[4] SMLC, *Implementing 21st Century Smart Manufacturing: Workshop Summary Report*, June 2011, http://www.energetics.com /resourcecenter/products/roadmaps/Documents/SMLC_Smart_Manufacturing.pdf, Access date March 8, 2015.

[5] PCAST AMP Steering Committee Report - Accelerating U.S. Advanced Manufacturing, October 27, 2014.

[6] NIST Standards.gov, What are Standards? http://www.nist.gov/standardsgov/definestandards.cfm.

[7] Gunasekaran, Agile Manufacturing: The 21st Century Competitive Strategy, Elsevier, 2001

[8] LNS Research, 2013. 28 Manufacturing Metrics that Actually Matter, http://blog.lnsresearch.com/blog/bid/188295/28-Manufacturing-Metrics-that-Actually-Matter-The-Ones-We-Rely-On.

[9] International Trade Administration, How does Commerce define Sustainable Manufacturing? 2010, http://www.trade.gov/competitiveness/sustainablemanufacturing/how_doc_defines_SM.asp.

[10] PCAST AMP Steering Committee Report - Accelerating U.S. Advanced Manufacturing, Annex 1-10: Transformative Manufacturing Technology, October 27, 2014.

[11] P. Witherell, B. Kulvatunyou, and S. Rachu, Toward the Synthesis of Product Knowledge across the Lifecycle, Proceedings of the ASME 2013 International Mechanical Engineering Congress & Exposition IMECE2013, November 13-21, 2013, San Diego, California, USA

[12] S. Faltinski, O. Niggemann, N. Moriz, A. Mankowski, AutomationML: From Data Exchange to System Planning and Simulation, 2012 IEEE International Conference on Industrial Technology (ICIT), Athens, Greek.

[13] P. Bolstorff, R. Rosenbaum (2003). Supply Chain Excellence: A Handbook for Dramatic Improvement Using the SCOR Model. AMACOM Div American Mgmt Assn. ISBN 0-8144-0730-7.

[14] D. Kibira, KC Morris, Background Study of Methods and Tools for Performance Assurance of Smart Manufacturing Systems, forthcoming NISTIR.

[15] CIMOSA, CIM Open System Architecture. URL: http://www.pera.net/Methodologies/Cimosa/CIMOSA.html, Access date March 8, 2015.

[16]R. Sessions, A Comparison of the Top Four Enterprise-Architecture Methodologies, URL: https://msdn.microsoft.com/en-us /library/bb466232.aspx. Access date March 8, 2015.
[17]German Standardization Roadmap, Industry 4.0. URL: https://www.dke.de/de/std/documents/rz_roadmap%20industrie%204-0_engl_web.pdf, Access date March 14, 2015.
[18]S. Rachuri, KC Morris, U. Roy, D. Dornfeld, S. Kumara, "Sustainable Manufacturing Program Workshop Report," NISTIR 7975, National Institute of Standards and Technology, November 2013.
[19]"Sustainable Manufacturing – A Business Perspective: A Technology Roadmap," University of Kentucky, Institute for Sustainable Manufacturing, Feb. 2015.
[20]International Organization for Standardization (ISO), http://www.iso.org.
[21]American Society for Mechanical Engineers, (ASME) https://www.asme.org
[22]ASTM International, http://astm.org
[23]American National Standards Institute (ANSI), http://ansi.org
[24]Open Source Initiative, http://opensource.org/osr-intro
[25]World Wide Web Consortium (W3C), http://www.w3.org
[26]Internet Engineering Task Force (IETF), http://ietf.org
[27]ISO 10303-1:1994, "Industrial automation systems and integration - Product data representation and exchange - Part 1: Overview and fundamental principles," International Organization for Standardization, 12/01/1994
[28]Open Applications Group Inc. (OAGi), http://www.oagi.org
[29]MTConnect Institute, http://mtconnect.org
[30]International Electrotechnical Commission (IEC), http://www.iec.ch
[31]OPC, https://opcfoundation.org
[32]Dimensional Metrology Standards Consortium (DMSC), http://www.dmsc-inc.org
[33]Manufacturing Enterprise Solutions Association International (MESA), http://mesa.org
[34]International Society of Automation (ISA), https://www.isa.org
[35]APICS, http://www.apics.org
[36]Industrial Internet Consortium (IIC), http://www.industrialinternetconsortium.org
[37]Institute of Electrical and Electronics Engineers (IEEE), http://www.ieee.org
[38]The Object Management Group, http://www.omg.org/
[39]NIST, Enabling the Digital Thread for Smart Manufacturing, http://www.nist.gov/el/msid/infotest/digital-thread-manufacturing.cfm
[40]NIST, Model-Based Enterprise Summit 2014, http://www.nist.gov/el/msid/mbesummit_2014.cfm
[41]National Institute of Standards and Technology (NIST), http://www.nist.gov
[42]NIST Big Data Program, http://bigdatawg.nist.gov/
[43]NIST Cybersecurity Framework, http://www.nist.gov/cyberframework
[44]www.manufacturing.gov
[45]G. Vogel-Heuser, G. Kegel, K. Bender, and K. Wucherer, Global information architecture for industrial automation. *Automatisierungstechnische Praxis (atp), Oldenbourg-Verlag, Muenchen*, 2009.
[46]https://www.whitehouse.gov/omb/circulars_a119/#3
[47]K. Amoako-Gyampah, M. Acquaah, Manufacturing strategy, competitive strategy and firm performance: An empirical study in a developing economy environment - International Journal of Production Economics, 2008
[48]STEP AP242 Project, www.ap242.org
[49]Encyclopedia Britannica. In Encyclopedia Britannica Online: http:// www.britannica.com, 2015
[50]Rajesh ATTRI, Sandeep GROVER, A comparison of production system life cycle models, Front. Mech. Eng. 2012, 7(3): 305–311

[51]J. Lubell,S.P. Frechette, R.R. Lipman, F.M. Proctor, J.A. Horst, M. Carlisle,P.J. Huang, 2013. Model-Based Enterprise Summit Report, NIST Technical Note 1820, U.S. Department of Commerce
[52]A. Barnard Feeney, S.P. Frechette, V. Srinivasan; "A portrait of an ISO STEP tolerancing standard as an enabler of smart manufacturing systems;" 13th CIRP Conference on Computer Aided Tolerancing; May 2014;
[53]A.V. Euler-Chelpin, Information modelling for the manufacturing system life cycle, Doctoral Thesis, KTH Royal Institute of Technology, Stockholm, Sweden, 2008
[54]K. Thramboulidis, IEC 61499 vs. 61131: A Comparison Based on Misperceptions, ournal of software engineering and applications 6(08), December, 2012
[55]VDI/VDE-Gesellschaft Mess und Automatisierungstechnik (GMA). Cyber-physical systems: Chancen und nutzen aus sicht der Automation, Thesen und Handlungsfelder, April 2013.
[56]Germany Trade and Invest, Industrie 4.0 Smart Manufacturing for the Future, http://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Brochures/Industries/industrie4.0-smart-manufacturing-for-the-future-en.pdf
[57]Recommendations for implementing the strategic initiative INDUSTRIE 4.0, http://www.acatech.de/fileadmin/user_upload/Baumstruktur_nach_Website/Acatech/root/de/Material_fuer_Sonderseiten/Industrie_4.0/Final_report__Industrie_4.0_accessible.pdf
[58]The Reference Architectural Model Industrie 4.0 (RAMI 4.0), http://www.zvei.org/Downloads/Automation/ZVEI-Industrie-40-RAMI-40-English.pdf
[59]Connecting machines, IoT and the Cloud, http://www.iec.ch/etech/2015/etech_0515/ind-1.htm, May 2015.
[60]K. Bledowski, The Internet of Things: Industrie 4.0 vs. the Industrial Internet https://www.mapi.net/research/publications/industrie-4-0-vs-industrial-internet, June, 2015.
[61]Open Interconnect Consortium, http://openinterconnect.org/
[62]Internet of Things Architecture, http://www.iot-a.eu/public
[63]https://www.iot-at-work.eu/index.html
[64]ETSI, Machine to Machine Communications, http://www.etsi.org/index.php/technologies-clusters/technologies/m2m
[65]M2M World news, Standards will be critical for the emergence of the Internet of Things, http://m2mworldnews.com/2014/07/31/80797-standards-will-be-critical-for-the-emergence-of-the-internet-of-things/, 2014
[66]OneM2M, http://www.onem2m.org/
[67]Open Mobile Alliance, http://openmobilealliance.org/about-oma/work-program/m2m-enablers/
[68]Eclipse IoT, http://iot.eclipse.org/standards
[69]HyperCat, http://www.hypercat.io/
[70]Weightless, http://www.weightless.org/
[71]Eclipse SCADA, http://www.eclipse.org/eclipsescada/
[72]NIST, Cyber-Physical Systems, http://www.nist.gov/cps/
[73]H2020 call1 2014 - topic ICT1 "Smart Cyber-Physical Systems" - Overview of selected projects, http://ec.europa.eu/digital-agenda/en/news/h2020-call1-2014-topic-ict1-smart-cyber-physical-systems-overview-selected-projects
[74]VDI, Fachausschuss 7.20 - Cyber-Physical Systems, https://www.vdi.de/technik/fachthemen/mess-und-automatisierungstechnik/fachbereiche/anwendungsfelder-der-automation/gma-fa-720-cyber-physical-systems/
[75]MESA, Smart Manufacturing Working Group, http://mesa.org/en/committeeactivities/smartmanufacturingworkinggroup.asp
[76]Smart Manufacturing Leadership Coalition, https://smartmanufacturingcoalition.org/

[77]NIST Workshop on Open Cloud Architectures for Smart Manufacturing, http://www.nist.gov/el/msid/opencloudarch.cfm
[78]Lydon, B., Automation & Control Trends in 2015, http://www.automation.com/automation-news/article/automation-control-trends-in-2015
[79]IPC, http://ipc.org
[80]Accenture, How the industrial internet is changing the competitive landscape of industries, https://www.accenture.com/us-en/insight-industrial-internet-competitive-landscape-industries.aspx
[81]ProSTEP iViP Association, http://www.prostep.org/nc/en.html
[82]ANSI, http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=1862af9b-7157-44fa-b43b-ee3b3e9029ba
[83]B. Roben, Standards Activities of Organizations in the United States, NIST Special Publication 806, 1996 Edition.
[84]Arden L. Bement , "Standards and Infrastructure: Foundations of Manufacturing Competitiveness", http://www.nist.gov/director/speeches/bement_032703.cfm
[85]Overview of the U.S. Standardization System, http://www.standardsportal.org/usa_en/standards_system.aspx
[86]The Empirical Economics of Standards JUNE 2005, DTI Economics Paper no.12, June 2005, http://www.sis.se/upload/632555702720125533.pdf
[87]Economic Benefits of Standardization , DIN - German Institute for Standardization, 2000, http://www.din.de/blob/89552/68849fab0eeeaafb56c5a3ffee9959c5/economic-benefits-of-standardization-en-data.pdf
[88]Standards Learn, http://www.standardslearn.org/
[89]T. J. Coelli, D. S. P. Rao, C.J. O'Donnell, G.E. Battese, An Introduction to Efficiency and Productivity Analysis, Springer, 2005
[90] A. V. Euler-Chelpin, Information modelling for the manufacturing system life cycle, Doctoral Thesis, KTH – Production Engineering, Stockholm, Sweden, 2008, ISSN 1650-1888
[91]A. Zuckerman, International Standards Desk Reference: Your Passport to World Markets, American Management Association, 1997
[92]https://www.modelica.org/
[93]The Data Mining Group, http://dmg.org/
[94]Global Harmonization of Standards, http://www.okstate.edu/ind-engr/step/WEBFILES/Papers/Global_Harm_body.htm
[95]NIST Smart Manufacturing Systems Design and Analysis Program, http://www.nist.gov/el/msid/syseng/smsda.cfm
[96]NIST Robotic Systems for Smart Manufacturing Program, http://www.nist.gov/el/isd/ms/rssm.cfm
[97]NIST Measurement Science for Additive Manufacturing Program, http://www.nist.gov/el/isd/sbm/msam.cfm

https://www.nist.gov/mep/advanced-manufacturing-technology-and-industry-40-services

National Institute of Standards and Technology
U.S. Department of Commerce

Manufacturing Extension Partnership (MEP)

(https://www.nist.gov/mep)

Advanced Manufacturing Technology and Industry 4.0 Services

Advanced manufacturing technologies, or Industry 4.0, involves automating traditional manufacturing processes using technologies such as robotics, Internet of Things (IoT), big data analytics, artificial intelligence, and autonomous systems. Advanced manufacturing technologies can improve manufacturing capability and efficiency. The MEP National Network™ can help you with your Industry 4.0 strategy and implementation.

Implementing these technologies can help your company by:

- Optimizing processes
- Shortening cycle times
- Improving quality
- Reducing energy losses
- Shortening downtimes
- Improving overall equipment effectiveness

It can be easy to get overwhelmed by technology options and knowing where to start. The good news is that technology adoption isn't all or nothing. The MEP National Network's manufacturing technology consulting services can show you low cost, easy-to-implement technologies that can drastically increase your productivity. With these, you can dip your toe into the world of Industry 4.0 (https://www.nist.gov/blogs/manufacturing-innovation-blog/cybersecurity-and-industry-40-what-you-need-know) and experience some of the benefits without major risks.

The MEP National Network will help you understand what technologies exists and if they are a good fit for your business. Our experts can help you establish an adoption strategy, scope the project, align suppliers with vetted resources and manage implementation to ensure your business goals and customer needs are met.

Augmented Reality and Virtual Reality

Augmented reality (AR) and virtual reality (https://www.nist.gov/blogs/manufacturing-innovation-blog/infographic-training-responding-skills-gap) (VR) technologies create new ways of seeing and monitoring the plant floor. What's the difference between AR and VR?

- AR **superimposes computer-generated images onto your view** of the world. You still see your surroundings, but extra information is incorporated into the real environment.
- VR **completely immerses** you in three-dimensional simulated environments that you can interact with in a seemingly real way. VR uses special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors.

How AR and VR can help small manufacturers:

- **Providing comprehensive, immersive training applications.** With VR and AR technologies, you can train employees to a standard of performance, quality and safety. The training can be repeated precisely, without change over time. This minimizes resource usage and results are tracked automatically. Using AR and VR can ensure your employees are properly trained to the same standard, easing knowledge transfer between employees. AR and VR also provide opportunities to practice different production scenarios that might arise so team members know how to handle a variety of challenges.
- **Guiding workers through repair and operating processes.** Companies can use AR and VR to regularly service equipment, without a training manual or parts catalog. With all information overlaid onto the machine through a simulation, workers can more easily and efficiently complete step-by-step instructions to repair, start up or shut down equipment. This can lower costs for manufacturers that invest excessive time into repairing equipment.

Big Data and Artificial Intelligence

Data should be a major consideration for your industry 4.0 strategy and implementation. Manufacturing facilities create an endless amount of data each day. Yet many manufacturers don't know how to collect or use it. Big data refers to large data sets gathered from a range of business areas. Manufacturers can use big data to reveal patterns and trends in operations, especially relating to human behavior and interaction. In short, big data can help you make more informed, educated business decisions.

Big data and artificial intelligence (https://www.nist.gov/blogs/manufacturing-innovation-blog/artificial-intelligence-manufacturing-real-world-success-stories) (AI) are connected. Big data is what enables AI's decision making. AI uses data from sensors, machines and people and then processes the information to make decisions without human intervention. It does so in a fraction of the time. The decisions made through the speed of AI can have significant impacts on production quality, capacity and waste.

How big data can help small manufacturers:

- **Monitoring product quality and operations.** Big data provides insight into every step of production. Through sensors attached to equipment, workers can see and respond to disruptions quickly – or even predict and prevent them. This ensures production runs efficiently and accurately. Increased awareness helps lower defects and unplanned machine downtime and it improves product quality. AI can further optimize processes since it analyzes data much quicker and more thoroughly. It also removes inconsistencies of human judgment about adjustments that need to be made.
- **Driving continuous improvement.** When gathering and analyzing supply chain data, weak spots quickly become apparent. With real-time data, your workers can quickly make changes that improve efficiency and quality – ultimately lowering defects and increasing profitability. Big data can drive strategic business decisions, providing a path forward to successful change.
- **Enabling demand forecasting.** Manufacturers can look back at historical data to identify trends in customer behavior and predict future demand. This helps manufacturers reduce stock levels and avoid shortages.

Artificial Intelligence: Key Consideration and Effective Implementation Strategies

Industrial Artificial Intelligence (IAI) brings advanced technology to the manufacturing floor, combining machine learning, decision-making rules, and human expertise to solve complex problems and improve operations. It can help identify equipment issues, predict maintenance needs, and optimize material selection for better product outcomes. This white paper (https://www.nist.gov/document/artificial-intelligence-key-consideration-and-effective-implementation-strategies) offers practical guidance and best practices, addressing some of the most common questions that small to medium-sized manufacturers have about IAI. Inside, you will find actionable steps for integrating IAI into your operations and unlocking its potential.

Robotics and Automation

In the increasingly competitive business landscape, manufacturers constantly look for ways to improve processes and boost their bottom line. Implementing robotics

and automation (https://www.nist.gov/mep/robotics-and-manufacturing-automation) in production enables many manufacturers to accomplish this goal. Using machines, robots (https://www.nist.gov/blogs/manufacturing-innovation-blog/infographic-what-cobots-can-do-your-business) and control systems to automate repetitive tasks makes your employees' jobs easier. Combining high-quality results with employee engagement and cost savings makes automation an increasingly essential innovation, leading more manufacturers to build "smart" factories. The Network's manufacturing technology consulting services can help you identify opportunities in a vendor-neutral environment so you are not hit with a sales pitch from the start.

How robotics and automation can help small manufacturers:

- **Improving efficiency and eliminating variation.** Robotics and automation effectively eliminate variation in production and help reduce the time needed to complete tasks. With human error and variation removed from certain parts of production, quality and efficiency will boom. These improvements translate into huge cost savings for manufacturers.
- **Increasing safety.** Many manufacturing environments involve potential safety issues for workers such as dangerous machinery, heavy lifting or toxic chemicals. Robots placed in these positions remove the risk of human error, increasing quality and safety – and enabling employees to move into safer roles.
- **Allowing for greater employee development.** Removing your workers from harmful environments enables them to take on new, more advanced tasks. Automating simple, manual tasks frees your employees for other positions – helping alleviate the current talent shortage in manufacturing. At the same time, automation supports your employee retention efforts. By providing workers with skills training and growth opportunities you'll increase their engagement and loyalty to your organization.

Additive Manufacturing

Additive manufacturing (https://www.nist.gov/blogs/manufacturing-innovation-blog/how-smaller-manufacturers-can-take-advantage-additive), also known as 3D printing (https://www.nist.gov/mep/additive-manufacturing3d-printing), is the practice of adding layers of material (such as plastic, metal, concrete or wood) on top of each other to create a product. Due to its many applications – rapid prototyping, repairs, waste reduction, flexible innovation – additive manufacturing has grown quickly in popularity.

How additive manufacturing can help small manufacturers:

- **Providing tooling opportunities.** With 3D printing, manufacturers create tools that would be impossible or too expensive to make with traditional methods. Because of the layering process, 3D-printed parts can be

stronger, more durable and higher quality overall. Additive manufacturing also minimizes waste. Additive uses only the material needed, without the excess material removed in traditional, subtractive manufacturing.

- **Allowing for quicker repairs.** The speed and flexibility of additive manufacturing allow manufacturers to efficiently replace old or broken machinery parts. Rather than going to an outside distributor for repairs, all parts can be created in house for quicker and easier replacements. This flexibility also enables you to add to existing parts to extend their life or create new use cases.
- **Improving the prototype process.** In the past, long lead times for prototyping held many manufacturers back from investing in innovation. With 3D printing, that's no longer the case – you can test a design's functionality without waiting weeks for it to be produced using traditional methods. Most 3D printers can print parts in just hours, rather than weeks or months. 3D printing enables greater flexibility and production innovation, as you can efficiently test new products and make changes before committing to a design.

Simulation

Production processes and parts designs can always be improved. Manufacturers face the challenge of figuring out what to change to get the best results. Simulation (https://www.nist.gov/blogs/manufacturing-innovation-blog/digital-manufacturing-small-manufacturers) software assists with this process. Using simulations, you can create virtual representations of a part or process. You can then validate improvement ideas without incurring a huge expense up front – and without impacting current production.

How simulation can help small manufacturers:

- **Making improvements in the facility, without moving heavy machinery.** With simulation, you don't have to move heavy equipment or disrupt production. Instead, with simulation software you can virtually test out different facility layouts to determine which is optimal. Real-world conditions can also be tested. You can simulate possible production situations and analyze how they would unfold.
- **Enhancing overall production effectiveness.** Once you've reorganized equipment according to the simulation to optimize processes, you'll quickly notice improvements in lead times, productivity and waste. These advancements would otherwise have taken much more time and expense – or been impossible without the help of simulation.
- **Testing new parts before making investments.** Similar to 3D printing, simulation allows you to develop and perfect designs for new parts before

investing. This results in cost savings, and provides higher confidence and quality in designs.

System integration

Gathering and analyzing data is easier than ever. System integration involves business management software like enterprise resource planning (ERP) systems. An ERP (https://www.nist.gov/blogs/manufacturing-innovation-blog/why-small-manufacturers-should-consider-manufacturing-execution) enables you to collect, store, manage and understand data from a variety of areas in your business. This centralized location for your organization's data makes for more efficient data management and increased transparency into business operations. System integration delivers information to those who need it, where and when they need it.

How system integration can help small manufacturers:

- **Providing one centralized location for data collection.** Many manufacturers don't collect data at all. Or they collect it, but aren't sure how to use it. System integration solves these issues by providing a unified source of data, enabling you to see all your collected data in one place. From there, data can more easily be compared and analyzed to inform strategic decision-making.
- **Improving visibility into the company's planning, scheduling and performance.** Data collection and broad company strategy are often forgotten in the busy day-to-day manufacturing environment. With system integration, you can quickly receive information from all levels of business operations. This helps you maintain a proper balance between daily management and driving future initiatives. Companywide data automatically gathered and presented by the software empowers you to identify areas to improve and set realistic goals for future performance.

Cloud Computing

Trying to find the right piece of information when you need it can be like finding a needle in a haystack. This can have serious consequences for manufacturers – putting quality, safety or productivity in jeopardy. Cloud computing eliminates these risks.

Cloud computing involves storing and accessing data and software applications through internet connectivity. This provides a faster, safer and more efficient way to locate company information. With all data in one convenient place, you can find exactly what you need, when you need it.

How cloud computing can help small manufacturers:

- **Allowing for quicker, easier access to information.** Companies that transfer all data storage to the cloud can instantly access any type of information, whenever it's needed. With data in one digital location, employees can easily find what they need without sorting through endless physical records. Speeding up this process enables your workers to spend more time focusing on larger business goals.
- **Empowering greater collaboration.** Cloud-based data storage greatly increases your ability to collaborate. Workers in different locations or departments can more easily collaborate when they're all using a single cloud-based data center.

Internet of Things

Internet of Things (IoT) (https://www.nist.gov/blogs/manufacturing-innovation-blog/whether-you-build-them-or-buy-them-iot-device-security-concerns) involves using sensors and communications technology to collect and share data that can improve operations. With increased interconnectivity, your company can monitor real-time performance to create an environment of complete visibility and productivity.

How IoT can help small manufacturers:

- **Providing real-time visibility into operations.** How effective are your processes? When is your next machine going to break down? Where are most defects coming from? These questions and more can be answered with IoT. Sensors in your facility can communicate key information about your operations directly to workers, in the moment. Sensor data gives you greater insight into various production elements. It enables you to predict machine breakdowns, locate bottlenecks and identify production areas that can be improved.
- **Optimizing performance.** This insightful data enables you to respond to production issues, minimizing or avoiding negative impacts. Preventive maintenance becomes predictive maintenance, allowing for scheduled downtime to maximize production. Your organization can achieve new levels of productivity with tools that help you use resources more efficiently, improve workplace safety and optimize production quality.

Cybersecurity

Unfortunately, the risk of cyberattack rises with increased interconnectivity. Electronic data collection, storage and transmission increase these risks. As

companies adopt Industry 4.0 technologies, more are targeted for cybertheft, damage or disruption. The importance of cybersecurity cannot be ignored.

Cybersecurity (https://www.nist.gov/blogs/manufacturing-innovation-blog/cybersecurity-and-industry-40-what-you-need-know) includes all measures to protect a company from the unauthorized use of electronic data. By safeguarding all hardware, software and information from internal and external threats, manufacturers can stay protected and prosperous while capitalizing on the benefits of the Internet of Things, interconnectivity and other technologies.

How cybersecurity can help small manufacturers:

- **Protecting your data.** The first step is to understand risks to your data. This involves identifying valuable company information and locating weak points in your systems' security. Potential breaches can then be predicted – or prevented.
- **Increasing your ability to detect, react and recover.** An incident response plan enables you to deal with various types of cyberattack, such as malware, phishing or social engineering. Having a plan in place heightens your company's chance of surviving these attacks. Each technology carries different risks, so it's important to think through the details of response plans before an attack.
- **Boosting your competitive advantage.** As data breaches increase, companies want to do business with other companies that protect themselves. Getting and keeping their business may depend on providing assurances that your company takes cybersecurity seriously and can be trusted to keep their information safe.

Employees often think robots will replace jobs, but that's not even close to what we're looking to do. We want to utilize the robot to help our people become efficient and enjoy their work more – shifting the tasks they don't enjoy as much to the robot and giving them more opportunities to do what they like doing.

—Hans Haase, ESI Manufacturing Engineer, Electronic Systems Inc.
Read the Success Story (https://www.nist.gov/mep/successstories/2020/picture-perfect-inspecting)

Blogs



NIST Explores AI-Enhanced Monitoring in Manufacturing Processes (https://www.nist.gov/blogs/manufacturing-

innovation-blog/nist-explores-ai-enhanced-monitoring-manuf
April 3, 2024
Michael Sharp (https://www.nist.gov/blogs/taking-measure
American manufacturing is associated with high-qua
ensure both the reliability and longevity of the produ



Revolutionizing American Manufacturing

(https://www.nist.gov/blogs/manufacturing-innovation-blog/revolutionizing-american-manufacturing)
February 2, 2023
Katie Rapp (https://www.nist.gov/blogs/manufacturing-innovation-blog/authors/katie-rapp)
A major focus of the current administration is revitalizing American manufacturing, and new technologies are changing the way things are made.
Manufacturing

Manufacturing Reports

Artificial Intelligence: Key Consideration and Effective Implementation Strategies (https://www.nist.gov/mep/manufacturing-reports/best-practices/artificial-intelligence-key-consideration-and-effective)

July 2025
Author MEP National Network

This white paper offers practical guidance and best practices, addressing some of the most common questions that small to medium-sized manufacturers have about Industrial Artificial Intelligence (IAI). You will find actionable steps for integrating IAI into your operations and unlocking its potential.

Best Practices (https://www.nist.gov/mep/manufacturing-reports/best-practices), Innovation, R&D and IP (https://www.nist.gov/mep/manufacturing-reports/innovation-rd-and-ip), NIST MEP Publications (https://www.nist.gov/mep/manufacturing-reports/nist-mep-publications) and Productivity (https://www.nist.gov/mep/manufacturing-reports/productivity)
Read more (https://www.nist.gov/mep/manufacturing-reports/best-practices/artificial-intelligence-key-consideration-and-effective)

Automation 101: How to Plan for Successful Implementation

(https://www.nist.gov/mep/manufacturing-reports/best-practices/automation-101-how-plan-

successful-implementation)
March 2025
Author MEP National Network

This white paper presents a strategic approach for manufacturers to successfully integrate automation. It offers practical advice on setting automation goals, identifying the most impactful automation projects (including the 10 most common ones we see), preparing employees for new technology, and understanding additional resources like cybersecurity protections needed for long-term success. We also highlight several success stories from small manufacturers across the country.

Best Practices (https://www.nist.gov/mep/manufacturing-reports/best-practices) and Productivity (https://www.nist.gov/mep/manufacturing-reports/productivity)
Read more (https://www.nist.gov/mep/manufacturing-reports/best-practices/automation-101-how-plan-successful-implementation)

Articles on Advanced Manufacturing Technology and Industry 4.0 by MEP National Network Experts

- Revolutionizing American Manufacturing (https://www.nist.gov/blogs/manufacturing-innovation-blog/revolutionizing-american-manufacturing)
- FastLane Helps Triangle Precision Increase Capacity With Automation (https://www.nist.gov/blogs/manufacturing-innovation-blog/fastlane-helps-triangle-precision-increase-capacity-automation)
- Infographic – Integrating Cybersecurity With Industry 4.0: What It Means for Manufacturing (https://www.nist.gov/blogs/manufacturing-innovation-blog/infographic-integrating-cybersecurity-industry-40-what-it-means)
- Cybersecurity Risk Mitigation for Small Manufacturers (https://www.nist.gov/blogs/manufacturing-innovation-blog/cybersecurity-risk-mitigation-small-manufacturers)

For more information or assistance with advanced manufacturing technologies or Industry 4.0, please contact an MEP Center (https://www.nist.gov/mep/centers).

If you would like someone to contact you about advanced manufacturing technologies or Industry 4.0, please complete the form below.

Required* Indicates required field
Your email

Your email Required*

Confirm email Required*

Message Required*

NIST will include and share your contact information in our information systems to enable us to manage interactions and relationships with you, our customer, and review how NIST provides products, services, and support. We do this by aggregating customer data from a number of authorized NIST systems. Your information will not be shared with information systems that are not authorized by NIST.

CAPTCHA

CLOUDFLARE
Privacidade • Ajuda

This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.

Submit

Manufacturing (https://www.nist.gov/topic-terms/manufacturing), Additive manufacturing (https://www.nist.gov/topic-terms/additive-manufacturing) and Robotics (https://www.nist.gov/topic-terms/robotics)

Contacts

For General Information

- MEP Headquarters
  mfg@nist.gov (https://www.nist.govmailto:mfg@nist.gov)
  (301) 975-5020
  100 Bureau Drive, M/S 4800
  Gaithersburg, MD 20899-4800

Created June 4, 2020, Updated July 14, 2025

Was this page helpful? (https://www.nist.gov/webform/page_feedback?page=https://www.nist.gov/mep/advanced-manufacturing-technology-and-industry-40-services&page_title=Advanced Manufacturing Technology and Industry 4.0 Services&source_entity_type=node&source_entity_id=1622941)

https://www.nist.gov/programs-projects/smart-manufacturing-systems-design-and-analysis-program

National Institute of Standards and Technology
U.S. Department of Commerce

PROJECTS/PROGRAMS (https://www.nist.gov/laboratories/projects-programs)

Smart Manufacturing Systems Design and Analysis Program

Summary

Deliver measurement science, standards and protocols, and tools needed to design and analyze SMS based on a cyber-physical infrastructure for digital and manufacturing systems.

Description

Smart Manufacturing has the potential to fundamentally change how products are designed, manufactured, supplied, used, remanufactured and eventually retired. Current smart manufacturing implementations are mostly at the plant level, and use information technology, sensor networks, computerized controls, and production management software to improve efficiency. The focus of the program is design and analysis of smart manufacturing system (SMS) that will enable industries to implement at the enterprise level, implementing real-time control and data analytics throughout the extended enterprise. Implementing predictive data analytics across the supply network offers new opportunities for process optimization and emphasize prediction in the PDSA (plan, do, study, act) cycle. While industry is making progress in developing and implementing smart manufacturing technologies, the systemic cyber-physical infrastructure and measurement science, standards, and protocols needed to deliver and deploy a large scale smart manufacturing environment remains to be developed. The cost of developing and implementing open software platforms and technologies based on common standards remain high, creating a significant barrier to entry particularly for small- and medium-size enterprises (SMEs). The Smart Manufacturing

Systems Design and Analysis program will address these issues and explore potential opportunities for dramatically rethinking the manufacturing system life cycle with a focus on assembly-centric production. For a smart manufacturing system, the program will build the following:

1. Reference architecture and open solution stack to enable and assess the composable SMS
2. Modeling methodology and associated tools to predict, assess, and optimize the operational performance
3. Data analytics and associated methods and tools to enable adaptive system
4. Methods and tools for system performance assurance. The results of this program will apply to broad industry sectors, and will lead to internationally accepted measures and practices.

What is the Problem?

Smart Manufacturing System (SMS) has the potential to fundamentally change how products are designed, manufactured, supplied, used, remanufactured and eventually retired. In the context of manufacturing, "smart" systems are adaptive systems with differing levels of autonomy. Built upon advanced cyber physical systems and data analytics, smart manufacturing system will enable rapid realization of products, dynamic response to changing demand, and real-time performance optimization of production and supply chain networks. Data analytics plays a critical role in enabling smart manufacturing. The recent Office of Science and Technology Policy (OSTP) memo identified big data analytics as one of the key multi-agency priorities. A recent industry report emphasized the application of big data analytics to manage complex manufacturing processes and supply chains. The President made revitalizing manufacturing a top U.S. priority, and launched the Advanced Manufacturing Partnership (AMP). The AMP Steering Committee made high-level recommendations that will set the stage for advanced manufacturing to thrive in the United States. Industry, academia, and government entities have formed the Smart Manufacturing Leadership Coalition (SMLC) to develop the smart manufacturing platform. The SMLC report (viii) outlines the outcomes and goals for SMS and identifies ten priority actions, which include creating modeling and simulation platforms, data collection and management systems, and enterprise wide integration systems for smart manufacturing.While industry is making progress in developing and implementing smart manufacturing technologies, the systemic cyber-physical infrastructure and measurement science, standards and protocols needed to deliver and deploy a large scale smart manufacturing environment remains to be developed. The next generation of smart manufacturing system needs to be developed by composing advanced manufacturing and IT services, yet the composition is not possible due to a lack of a smart manufacturing reference architecture and solution stack. There is a big measurement science gap between the existing models of manufacturing systems and the analytical models that are required to precisely characterize manufacturing systems for performance assurance. Also, the cost of developing and implementing

open software platforms and technologies based on common standards remain high creating a significant barrier to entry, particularly for small- and medium-size enterprises (SMEs). The program will address these issues and explore potential opportunities for dramatically rethinking the manufacturing process with a focus on assembly-centric production . The program will build the following for a smart manufacturing system:

1. Reference architecture and open solution stack to enable and assess the design and operation
2. Modeling methodology and associated tools to predict, assess, and optimize the operational performance
3. Data analytics and associated methods and tools to enable adaptive system
4. System performance assurance methods and tools to minimize risk. The results of this program will apply to broad industry sectors, and will lead to internationally accepted measures and practices.

What is the technical idea?

The objective of this program is to deliver measurement science, standards and protocols, and tools needed to design and analysis (predict, assess, optimize, and control the performance) of smart manufacturing system. The new technical idea to achieve this objective is the following: 1) Define what the performance of SMS is and how we measure it in a computational and mathematical sense, 2) Define methods to develop analytical and compositional models of SMS, 3) Define methods to collect, analyze, and utilize data required to predict, assess, optimize, and control the performance of SMS, and 4) Define a reference architecture and methodology to implement methods and tools to predict, assess, optimize, and control the performance of SMS from a system engineering perspective.

The major projects of the Smart Manufacturing Systems Design and Analysis program are listed below.

1. Build reference architecture and open solution stack to enable and assess composable smart manufacturing systems. The new technical idea is to develop an effective systems engineering methodology for developing, maintaining, and using the reference architecture and solution stack. Smart Manufacturing Reference Architecture will be an authoritative source of information that guides and constrains the instantiations of multiple architectures and solutions.
2. Build modeling methodology and associated tools to predict, assess, and optimize the operational performance of smart manufacturing systems, including uncertainty propagation and compositional modeling. The new technical idea is to bring together the conceptual modeling, information modeling, and behavior modeling paradigms to enable analytical frameworks that use domain-specific and mathematical modeling tailored to application in smart manufacturing.

3. Build data analytics and associated methods and tools to enable and assess diagnostics and prognostics for smart manufacturing systems in real time. The new technical idea is to develop open protocols, analytical models, implementation frameworks and standards to enable the application of data analytics to turn data into insights and actions. Towards this end, this project will deliver an analytical framework for real-time (xxi) improvement of dynamic production system efficiency.
4. Build system performance assurance methods and tools for smart manufacturing systems (including, e.g., automated testing). The new technical idea is to develop measures of performance, such as metrics for energy and material for sustainability, in addition to more traditional measures including cost, quality, reliability, and productivity as the basis for measuring the performance of individual processes and system. The results of these projects will enable the convergence of intelligent devices, intelligent networks and intelligent decisions. The results will further enable information integration to support agile supply networks, real-time monitoring and controlling of manufacturing plants and assets, and rapid customization and realization of products.

What is the research plan?

The research plan is organized into architecture and modeling thrust and predictive analytics and performance assurance thrust. The detailed plan is described in the individual project plans.

The architecture and modeling thrust has two major projects:

1. Reference Architecture for Smart Manufacturing Systems: The research plan is geared to achieve necessary contributions to develop successful reference architecture and solution stack. The architecture framework will be developed to provide conceptual guidelines for developing system architectures, tools, and methodologies for designing the architectures, general principles, knowledge base and models of the smart manufacturing system, and experimental methods for architecture assessment on increasingly complex collections of smart manufacturing systems descriptions. The research emphasis will be to build architecture framework for SMS.
2. Modeling Methodology for Smart Manufacturing Systems: We have two threads of existing work to draw upon. Based on the previous work on the Sustainable Process Analytics Formalism in the Sustainable Manufacturing program and Decision Guidance Modeling Language (DGML), we will develop a general architecture for analytical frameworks. We will develop formal methods and tools for dynamic composition of manufacturing components (e.g., resources, equipment, hardware, and software) models to facilitate smart manufacturing system prediction and performance assurance. The formal models of components of SMS will be described at different levels of abstraction, namely, informational, mathematical, and

behavioral. In order to predict and assure system level performance for different manufacturing scenarios, we need these models to be dynamically composable in an analytic environment, representing the larger production system. Based on international standards, we will develop methods of verification and validation and requirements traceability for SMS. The first task is to define requirements for analytical frameworks for SMS. The project will develop an architectural description of analytical frameworks, based on the requirements analysis and the previous work in the sustainable manufacturing program.

3. The predictive analytics and performance assurance thrust has two major projects: Real-Time Data Analytics for Smart Manufacturing Systems: To understand the predictive analytics workflow, this project will focus on the following research areas:
    1. Requirements analysis and the state of the art in manufacturing data management (volume, velocity, variety, veracity),
    2. Analysis of predictive modeling techniques, rules for analytical model composition, metrics, and optimization methods and tools,
    3. Identification of standards to represent a myriad of predictive modeling techniques, such as PMML (xxiv), to fully support data analytics for manufacturing applications, and
    4. Requirements analysis of interactive data visualization for analytics. Data visualization is an art and a science unto itself, and there are many techniques that can be used to get insights from the data.
4. Performance Assurance for Smart Manufacturing Systems: The project will address the problem of performance assurance from multiple directions: 1) Identify the unique characteristics for performance issues and metrics for SMS, 2) Develop methods for interpreting metrics in terms of the performance objectives for SMS, 3) Identify approaches to address performance deviation, and 4) Demonstrate the use of performance measures in a system context. The metrics for performance assurance will be approached separately for each of the three performance objectives, namely sustainability, agility, and asset utilization. Results from this project will contribute to standards development activities within ASTM E60.13.

Major Accomplishments

Some recent accomplishments for the New Technology Adoption and Industry Operations Analysis for Smart Manufacturing include:

- NIST Special Publication 1142: The Current State and Recent Trends of the US Manufacturing Industry.
- NIST Special Publication 1176: Costs and Cost Effectiveness of Additive Manufacturing
- NIST Technical Note 1810: The US Manufacturing Value Chain: An International Perspective

Some recent accomplishments for the Real-Time Data Analytics for Smart Manufacturing Systems include:

- Gaussian process regression extension to the Data Mining Group Predictive Model Markup Language (PMML) standard. The extension provides a standard mechanism to represent confidence bounds for predictive estimations in system modeling.
- Journal article describing the data generator using virtual and domain specific models of manufacturing machines.
- Journal report on data acquisition, data analytics, optimization, and UQ using existing software.
- Journal report on Uncertainty Quantification (UQ) and sensitivity analyses for prediction model for time varying data.

Manufacturing (https://www.nist.gov/topic-terms/manufacturing), Manufacturing systems design and analysis (https://www.nist.gov/topic-terms/manufacturing-systems-design-and-analysis), Process improvement (https://www.nist.gov/topic-terms/process-improvement), Process measurement and control (https://www.nist.gov/topic-terms/process-measurement-and-control), Sustainable manufacturing (https://www.nist.gov/topic-terms/sustainable-manufacturing), Systems engineering (https://www.nist.gov/topic-terms/systems-engineering) and Systems integration (https://www.nist.gov/topic-terms/systems-integration)
Created April 18, 2014, Updated March 26, 2025

Former Staff

Program Manager - Simon Frechette (https://www.nist.govmailto:simon.frechette@nist.gov)

Associate Program Manager - KC Morris (https://www.nist.gov)

Project Status

Ongoing

Related NIST Projects

Agri-Food Manufacturing System and Supply Chain Integration (https://www.nist.gov/programs-projects/agri-food-manufacturing-system-and-supply-chain-integration)
Data Analytics for Smart Manufacturing Systems (https://www.nist.gov/programs-projects/data-analytics-smart-manufacturing-systems)
New Technology Adoption and Industry Operations Analysis for Smart Manufacturing (https://www.nist.gov/programs-projects/new-technology-adoption-and-

industry-operations-analysis-smart-manufacturing)

Modeling Methodology for Smart Manufacturing (https://www.nist.gov/programs-projects/modeling-methodology-smart-manufacturing)

Operations-driven Performance Measurement for Smart Manufacturing Systems (https://www.nist.gov/programs-projects/operations-driven-performance-measurement-smart-manufacturing-systems)

Service-Oriented Architectures for Smart Manufacturing Project (https://www.nist.gov/programs-projects/service-oriented-architectures-smart-manufacturing-project)

Was this page helpful? (https://www.nist.gov/webform/page_feedback?page=https://www.nist.gov/programs-projects/smart-manufacturing-systems-design-and-analysis-program&page_title=Smart Manufacturing Systems Design and Analysis Program&source_entity_type=node&source_entity_id=417661)

https://www.nist.gov/programs-projects/smart-manufacturing-systems-design-and-analysis-program

National Institute of Standards and Technology
U.S. Department of Commerce

PROJECTS/PROGRAMS (https://www.nist.gov/laboratories/projects-programs)

Smart Manufacturing Systems Design and Analysis Program

Summary

Deliver measurement science, standards and protocols, and tools needed to design and analyze SMS based on a cyber-physical infrastructure for digital and manufacturing systems.

Description

Smart Manufacturing has the potential to fundamentally change how products are designed, manufactured, supplied, used, remanufactured and eventually retired. Current smart manufacturing implementations are mostly at the plant level, and use information technology, sensor networks, computerized controls, and production management software to improve efficiency. The focus of the program is design and analysis of smart manufacturing system (SMS) that will enable industries to implement at the enterprise level, implementing real-time control and data analytics throughout the extended enterprise. Implementing predictive data analytics across the supply network offers new opportunities for process optimization and emphasize prediction in the PDSA (plan, do, study, act) cycle. While industry is making progress in developing and implementing smart manufacturing technologies, the systemic cyber-physical infrastructure and measurement science, standards, and protocols needed to deliver and deploy a large scale smart manufacturing environment remains to be developed. The cost of developing and implementing open software platforms and technologies based on common standards remain high, creating a significant barrier to entry particularly for small- and medium-size enterprises (SMEs). The Smart Manufacturing

Systems Design and Analysis program will address these issues and explore potential opportunities for dramatically rethinking the manufacturing system life cycle with a focus on assembly-centric production. For a smart manufacturing system, the program will build the following:

1. Reference architecture and open solution stack to enable and assess the composable SMS
2. Modeling methodology and associated tools to predict, assess, and optimize the operational performance
3. Data analytics and associated methods and tools to enable adaptive system
4. Methods and tools for system performance assurance. The results of this program will apply to broad industry sectors, and will lead to internationally accepted measures and practices.

What is the Problem?

Smart Manufacturing System (SMS) has the potential to fundamentally change how products are designed, manufactured, supplied, used, remanufactured and eventually retired. In the context of manufacturing, "smart" systems are adaptive systems with differing levels of autonomy. Built upon advanced cyber physical systems and data analytics, smart manufacturing system will enable rapid realization of products, dynamic response to changing demand, and real-time performance optimization of production and supply chain networks. Data analytics plays a critical role in enabling smart manufacturing. The recent Office of Science and Technology Policy (OSTP) memo identified big data analytics as one of the key multi-agency priorities. A recent industry report emphasized the application of big data analytics to manage complex manufacturing processes and supply chains. The President made revitalizing manufacturing a top U.S. priority, and launched the Advanced Manufacturing Partnership (AMP). The AMP Steering Committee made high-level recommendations that will set the stage for advanced manufacturing to thrive in the United States. Industry, academia, and government entities have formed the Smart Manufacturing Leadership Coalition (SMLC) to develop the smart manufacturing platform. The SMLC report (viii) outlines the outcomes and goals for SMS and identifies ten priority actions, which include creating modeling and simulation platforms, data collection and management systems, and enterprise wide integration systems for smart manufacturing.While industry is making progress in developing and implementing smart manufacturing technologies, the systemic cyber-physical infrastructure and measurement science, standards and protocols needed to deliver and deploy a large scale smart manufacturing environment remains to be developed. The next generation of smart manufacturing system needs to be developed by composing advanced manufacturing and IT services, yet the composition is not possible due to a lack of a smart manufacturing reference architecture and solution stack. There is a big measurement science gap between the existing models of manufacturing systems and the analytical models that are required to precisely characterize manufacturing systems for performance assurance. Also, the cost of developing and implementing

open software platforms and technologies based on common standards remain high creating a significant barrier to entry, particularly for small- and medium-size enterprises (SMEs). The program will address these issues and explore potential opportunities for dramatically rethinking the manufacturing process with a focus on assembly-centric production . The program will build the following for a smart manufacturing system:

1. Reference architecture and open solution stack to enable and assess the design and operation
2. Modeling methodology and associated tools to predict, assess, and optimize the operational performance
3. Data analytics and associated methods and tools to enable adaptive system
4. System performance assurance methods and tools to minimize risk. The results of this program will apply to broad industry sectors, and will lead to internationally accepted measures and practices.

What is the technical idea?

The objective of this program is to deliver measurement science, standards and protocols, and tools needed to design and analysis (predict, assess, optimize, and control the performance) of smart manufacturing system. The new technical idea to achieve this objective is the following: 1) Define what the performance of SMS is and how we measure it in a computational and mathematical sense, 2) Define methods to develop analytical and compositional models of SMS, 3) Define methods to collect, analyze, and utilize data required to predict, assess, optimize, and control the performance of SMS, and 4) Define a reference architecture and methodology to implement methods and tools to predict, assess, optimize, and control the performance of SMS from a system engineering perspective.

The major projects of the Smart Manufacturing Systems Design and Analysis program are listed below.

1. Build reference architecture and open solution stack to enable and assess composable smart manufacturing systems. The new technical idea is to develop an effective systems engineering methodology for developing, maintaining, and using the reference architecture and solution stack. Smart Manufacturing Reference Architecture will be an authoritative source of information that guides and constrains the instantiations of multiple architectures and solutions.
2. Build modeling methodology and associated tools to predict, assess, and optimize the operational performance of smart manufacturing systems, including uncertainty propagation and compositional modeling. The new technical idea is to bring together the conceptual modeling, information modeling, and behavior modeling paradigms to enable analytical frameworks that use domain-specific and mathematical modeling tailored to application in smart manufacturing.

3. Build data analytics and associated methods and tools to enable and assess diagnostics and prognostics for smart manufacturing systems in real time. The new technical idea is to develop open protocols, analytical models, implementation frameworks and standards to enable the application of data analytics to turn data into insights and actions. Towards this end, this project will deliver an analytical framework for real-time (xxi) improvement of dynamic production system efficiency.
4. Build system performance assurance methods and tools for smart manufacturing systems (including, e.g., automated testing). The new technical idea is to develop measures of performance, such as metrics for energy and material for sustainability, in addition to more traditional measures including cost, quality, reliability, and productivity as the basis for measuring the performance of individual processes and system. The results of these projects will enable the convergence of intelligent devices, intelligent networks and intelligent decisions. The results will further enable information integration to support agile supply networks, real-time monitoring and controlling of manufacturing plants and assets, and rapid customization and realization of products.

What is the research plan?

The research plan is organized into architecture and modeling thrust and predictive analytics and performance assurance thrust. The detailed plan is described in the individual project plans.

The architecture and modeling thrust has two major projects:

1. Reference Architecture for Smart Manufacturing Systems: The research plan is geared to achieve necessary contributions to develop successful reference architecture and solution stack. The architecture framework will be developed to provide conceptual guidelines for developing system architectures, tools, and methodologies for designing the architectures, general principles, knowledge base and models of the smart manufacturing system, and experimental methods for architecture assessment on increasingly complex collections of smart manufacturing systems descriptions. The research emphasis will be to build architecture framework for SMS.
2. Modeling Methodology for Smart Manufacturing Systems: We have two threads of existing work to draw upon. Based on the previous work on the Sustainable Process Analytics Formalism in the Sustainable Manufacturing program and Decision Guidance Modeling Language (DGML), we will develop a general architecture for analytical frameworks. We will develop formal methods and tools for dynamic composition of manufacturing components (e.g., resources, equipment, hardware, and software) models to facilitate smart manufacturing system prediction and performance assurance. The formal models of components of SMS will be described at different levels of abstraction, namely, informational, mathematical, and

behavioral. In order to predict and assure system level performance for different manufacturing scenarios, we need these models to be dynamically composable in an analytic environment, representing the larger production system. Based on international standards, we will develop methods of verification and validation and requirements traceability for SMS. The first task is to define requirements for analytical frameworks for SMS. The project will develop an architectural description of analytical frameworks, based on the requirements analysis and the previous work in the sustainable manufacturing program.

3. The predictive analytics and performance assurance thrust has two major projects: Real-Time Data Analytics for Smart Manufacturing Systems: To understand the predictive analytics workflow, this project will focus on the following research areas:
    1. Requirements analysis and the state of the art in manufacturing data management (volume, velocity, variety, veracity),
    2. Analysis of predictive modeling techniques, rules for analytical model composition, metrics, and optimization methods and tools,
    3. Identification of standards to represent a myriad of predictive modeling techniques, such as PMML (xxiv), to fully support data analytics for manufacturing applications, and
    4. Requirements analysis of interactive data visualization for analytics. Data visualization is an art and a science unto itself, and there are many techniques that can be used to get insights from the data.
4. Performance Assurance for Smart Manufacturing Systems: The project will address the problem of performance assurance from multiple directions: 1) Identify the unique characteristics for performance issues and metrics for SMS, 2) Develop methods for interpreting metrics in terms of the performance objectives for SMS, 3) Identify approaches to address performance deviation, and 4) Demonstrate the use of performance measures in a system context. The metrics for performance assurance will be approached separately for each of the three performance objectives, namely sustainability, agility, and asset utilization. Results from this project will contribute to standards development activities within ASTM E60.13.

Major Accomplishments

Some recent accomplishments for the New Technology Adoption and Industry Operations Analysis for Smart Manufacturing include:

- NIST Special Publication 1142: The Current State and Recent Trends of the US Manufacturing Industry.
- NIST Special Publication 1176: Costs and Cost Effectiveness of Additive Manufacturing
- NIST Technical Note 1810: The US Manufacturing Value Chain: An International Perspective

Some recent accomplishments for the Real-Time Data Analytics for Smart Manufacturing Systems include:

- Gaussian process regression extension to the Data Mining Group Predictive Model Markup Language (PMML) standard. The extension provides a standard mechanism to represent confidence bounds for predictive estimations in system modeling.
- Journal article describing the data generator using virtual and domain specific models of manufacturing machines.
- Journal report on data acquisition, data analytics, optimization, and UQ using existing software.
- Journal report on Uncertainty Quantification (UQ) and sensitivity analyses for prediction model for time varying data.

Manufacturing (https://www.nist.gov/topic-terms/manufacturing), Manufacturing systems design and analysis (https://www.nist.gov/topic-terms/manufacturing-systems-design-and-analysis), Process improvement (https://www.nist.gov/topic-terms/process-improvement), Process measurement and control (https://www.nist.gov/topic-terms/process-measurement-and-control), Sustainable manufacturing (https://www.nist.gov/topic-terms/sustainable-manufacturing), Systems engineering (https://www.nist.gov/topic-terms/systems-engineering) and Systems integration (https://www.nist.gov/topic-terms/systems-integration)
Created April 18, 2014, Updated March 26, 2025

Former Staff

Program Manager - Simon Frechette (https://www.nist.govmailto:simon.frechette@nist.gov)

Associate Program Manager - KC Morris (https://www.nist.gov)

Project Status

Ongoing

Related NIST Projects

Agri-Food Manufacturing System and Supply Chain Integration (https://www.nist.gov/programs-projects/agri-food-manufacturing-system-and-supply-chain-integration)
Data Analytics for Smart Manufacturing Systems (https://www.nist.gov/programs-projects/data-analytics-smart-manufacturing-systems)
New Technology Adoption and Industry Operations Analysis for Smart Manufacturing (https://www.nist.gov/programs-projects/new-technology-adoption-and-

industry-operations-analysis-smart-manufacturing)

Modeling Methodology for Smart Manufacturing (https://www.nist.gov/programs-projects/modeling-methodology-smart-manufacturing)

Operations-driven Performance Measurement for Smart Manufacturing Systems (https://www.nist.gov/programs-projects/operations-driven-performance-measurement-smart-manufacturing-systems)

Service-Oriented Architectures for Smart Manufacturing Project (https://www.nist.gov/programs-projects/service-oriented-architectures-smart-manufacturing-project)

Was this page helpful? (https://www.nist.gov/webform/page_feedback?page=https://www.nist.gov/programs-projects/smart-manufacturing-systems-design-and-analysis-program&page_title=Smart Manufacturing Systems Design and Analysis Program&source_entity_type=node&source_entity_id=417661)

U.S. Customs and Border Protection

ACE: The Import and Export Processing System



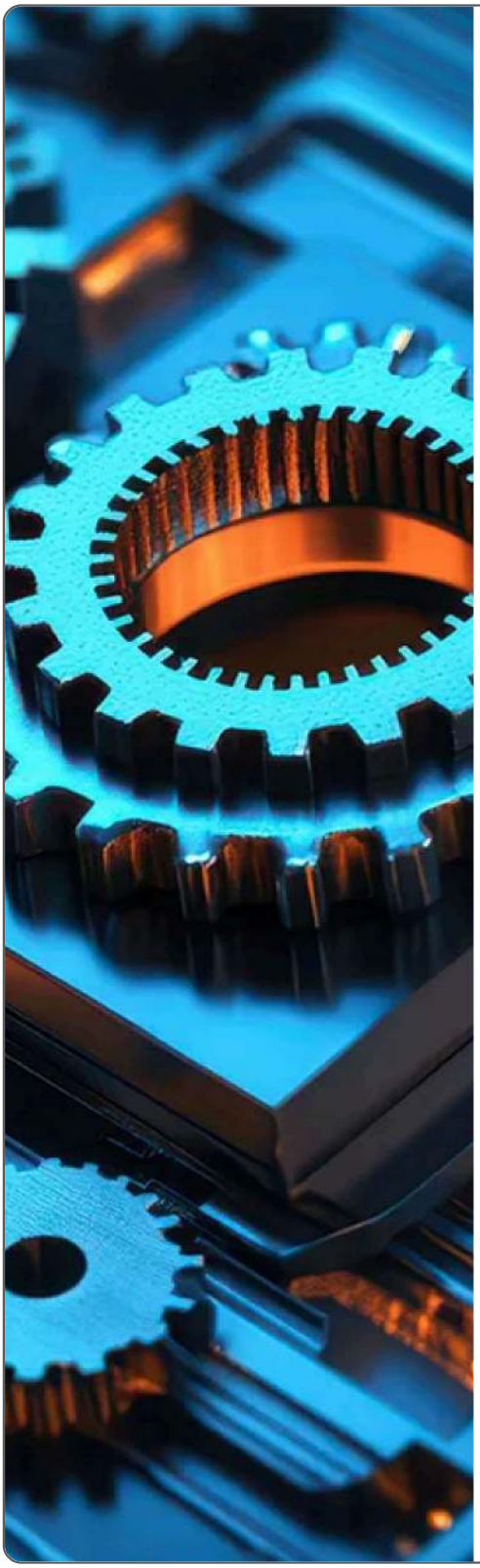
The Automated Commercial Environment (ACE) is the United States' centralized digital system for processing imports and exports. To move goods across the U.S. border, U.S. Customs and Border Protection (CBP) and partner government agencies require importers and exporters to use ACE to provide detailed information. This enables CBP to collect tariff revenue, control imports, and enforce regulations. ACE is also known as the U.S. "Single Window" because it provides a single, centralized access point connecting CBP, Partner Government Agencies and the business community.



Stay Connected!

Have Questions?
Ask the Ask ACE chatbot

Sign up to receive news and updates on ACE directly in your inbox via CBP's Cargo Systems Messaging Service (CSMS).



ACE Deployments

Highlighted Deployments

Trade Information Notice: Inactive for Entry Purposes

Resources for Enrolling to Receive Customs-Related Refunds from CBP

- One Page Overview: ACH Refund Enrollment Overview
- ACE Portal and ACH Refunds FAQs
- Training Guide: ACE Portal Importer Account Application
- Training Guide: ACH Refund Enrollment in the ACE Portal | Guide
- Training Video: ACH Refund Enrollment in the ACE Portal | Video
- Training Guide: Using ACE Refund Reports
- Rejected ACH Refund Information: Replacement Refund Instructions

Additional Deployment Resources

- View the ACE Deployment Archive for all completed deployments

Have Questions?
Ask the Ask ACE chatbot

How to Use ACE



ACE is the U.S. electronic Single Window platform for all trade processing, including all Manifest, Cargo Release, Post-release, Export and Partner Government Agency (PGA) data.

View the How to Use ACE page for more information



ACE Portal

The ACE Secure Data Portal (ACE Portal) is a web-based entry point for ACE users. It provides a centralized online access point to connect CBP, the trade community and government agencies involved in importing goods into the United States, and gives account holders access to their data.

Introduction to an ACE Secure Data Portal Account

ACE Portal Basics One-Pager

ACE Portal Login



ACE Reports

With ACE Reports, users can run targeted reports to conduct in-house audits, identify systemic errors and provide insight into entries under review by CBP.

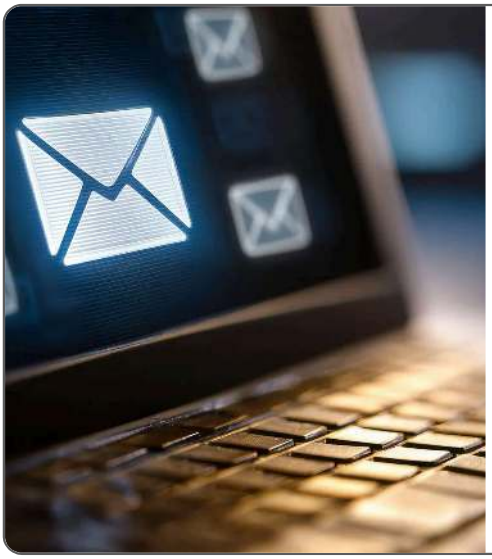
View the ACE Re

Have Questions?
Ask the Ask ACE chatbot



Technical Resources

- CATAIR (CBP and Trade Automated Interface Requirements)
- CAMIR (Customs Automated Manifest Interface Requirements)
- AESTIR (Automated Export System Trade Interface Requirements)
- Deployment Archive



Cargo Systems Messaging Service (CSMS)

- CSMS Homepage, including recent CSMS messages
- Register to receive CSMS messages by email
- CSMS Message Archive



ACE Support & Resources

- How to Use ACE
- Apply for an ACE Portal Account

Have Questions?
Ask the Ask ACE chatbot

- ACE Reports
- ACE Support
- ACE Training and Reference Guides
- ACE FAQs
- ACE Availability Dashboard
- ACE Infographic
- ACE Deployments
- CBP Trade Homepage
- Cargo Systems Messaging Service (CSMS)

Visit Other Related CBP Pages



CROSS: Customs Rulings Online Search System



Enforce and Protect Act (EAPA)



AD/CVD Search



Intellectual Property Rights e-Recordation (IPRR) Online System

Have Questions?
Ask the Ask ACE chatbot

An official website of the United States Government
Here's how you know

FEDS Notes

Twitter Share RSS

February 03, 2022

Using Distributed Ledger Technology for Payment Directories

Peter Lone, Kumar Nagarajan, Trish Supples, and Paul Wong[1]

Introduction

The use of widely accessible and comprehensive payment directories can enable a safer, more efficient, and more accessible payments system. Payment directories, which are informational databases that support the exchange of payment information, could allow for more end-user convenience, easier fraud mitigation techniques, greater payment routing accuracy, easier switching of service providers, and faster exchange of e-invoices and remittance information. Two common types of payment directories include a peer-to-peer (P2P) payments alias directory to support consumer payments and a business-to-business (B2B) e-invoicing registry to support business payments.

Currently, payment directories in the United States–both P2P and B2B–are highly fragmented and not interoperable. Directories operate in closed ecosystems because service providers treat their network and accompanying information as a valuable asset. Closed ecosystems typically arise from a lack of common standards, which may lead a firm to protect a network that they have spent months and years building over time. Distributed ledger technology (DLT) has the potential to change this dynamic by offering new ways to think about how directory services can operate. A potentially defining feature of DLT is that it allows information exchange without the need to transfer ownership of data assets through a distributed (and possibly federated) database model.

Distributed ledgers have the potential to provide new opportunities for value creation and to address market inefficiencies by reducing the costs of managing a common ledger, democratizing control of information among participants, eliminating the need for a central entity to manage the database, and allowing for localized control of potentially sensitive business and customer information. DLT encompasses the processes and related technologies that enable participants in a network to maintain a synchronized, distributed ledger without the need for a central administrator.[2] Cooperative management of a common directory could connect separate directories in support of greater payments efficiency.

Payment directories

Payment directories enable payers to send money more easily by supporting a more efficient lookup of payee information, such as which payment system to use, which account to pay, and what bills may be outstanding. There are two broad types of payment directories: payment (or account) alias directories that support consumer payments and business

registries that support business-to-business (B2B) payments and the delivery of supporting information like invoices and remittance information. Payment alias directories typically tie a public identifier, such as a telephone number or email address, to a payment account at a bank or elsewhere. B2B registries can support a variety of data lookups, including information on the routing of e-invoices and payment details, such as where and how to send payments. The registries may only carry metadata details for routing and no sensitive information that is considered a business asset.

Payment alias directories

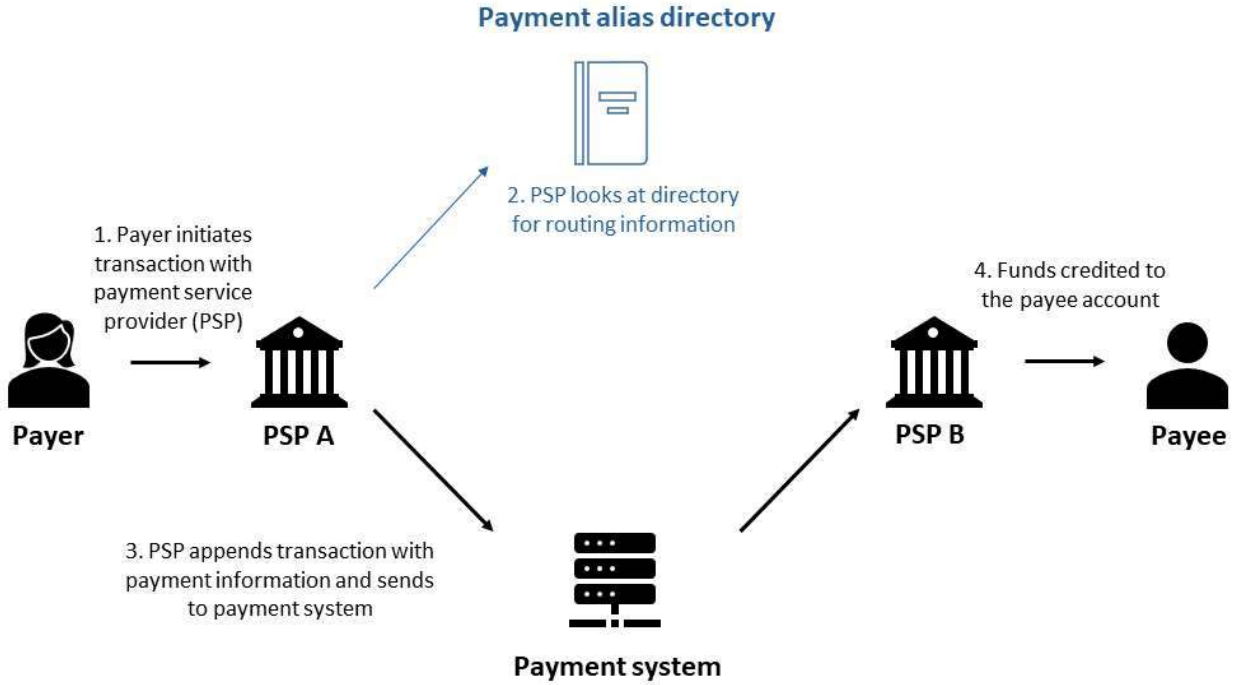
When consumers make electronic payments, they typically use retail bank accounts. In such cases, the payer needs to know the transacting bank routing number and associated account to initiate the payment. This requires a payer to provide a 9-digit bank routing number followed by an account number that could be 17 digits long for the payment order. Entering these numbers manually into a payment order is cumbersome and allows for data entry mistakes. Over the past two decades, new payment services have emerged that permit users to originate or validate payments with easy-to-remember public information such as a phone number, email address, or username.

Zelle operates the largest such payment alias directory for bank-initiated transactions in the United States, and Venmo and PayPal are two nonbank payment service providers (PSPs) whose payment services have also driven the use of aliases in the United States.[3] All three services allow users to link their account information to an email address or phone number. In the case of Venmo and PayPal, users can also send payments using a user-generated identifier. The three services are not interoperable, even though Venmo and Paypal are owned by the same company. Indeed, most payment networks operate in closed ecosystems; users can send payments to only other users on the platform.

A common payment alias directory, or a directory of directories, could improve efficiency and integrity in the payments market. Payments made using alias information, for example, could avoid a situation where an individual or business does not have an individual's latest bank account information. Inaccurate bank account information could delay receipt of a payment. In addition, a payment alias directory could enhance consumer choice by reducing the costs of switching payment service providers, including switching between banks.[4] The use of an alias could eliminate the need to inform counterparties of service provider account changes.

Such a common directory, or directory of directories, could be built in several ways, depending on market objectives. Figure 1 outlines how a directory service could fit into the broader payments landscape. If a payer uses an alias of a payee in lieu of the person's banking information, the payer's bank or other payment service provider could retrieve the payee's banking information using the designated alias. A payment alias database could provide guidance on where to route the payment, which could include information on which payment system to use and the associated account numbers. Depending on design, nonbank service providers could also be included to support alias interoperability between bank and nonbank systems.

Figure 1. Stylized process flow for payment alias directory in a payment transaction



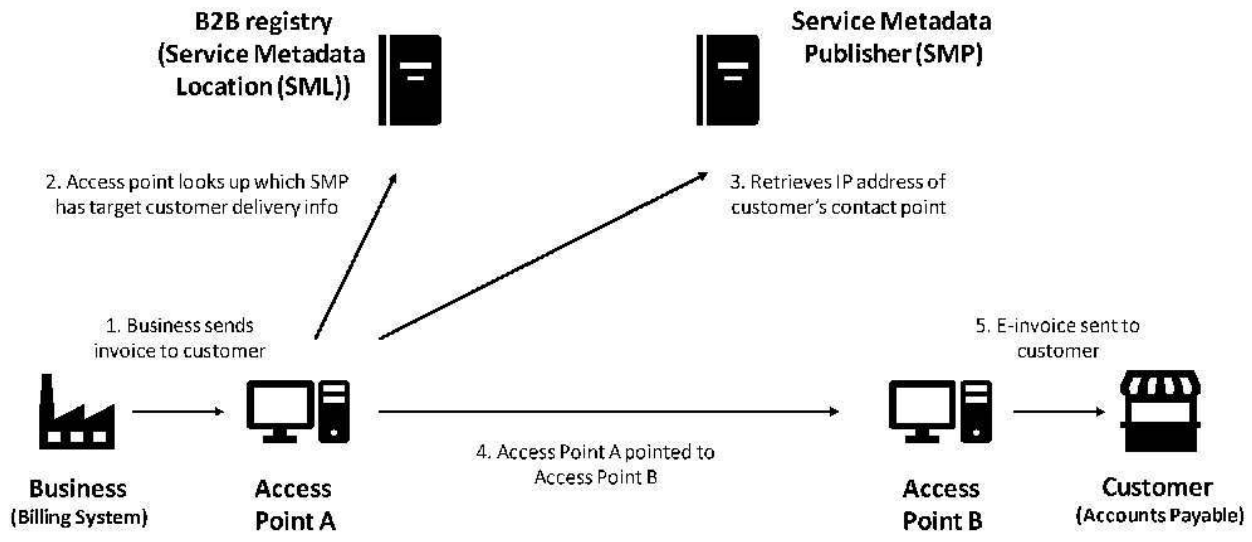
Accessible version

Business-to-business payment registries

Payment directories can also be used in B2B payments, including e-invoicing and bill payment routing.[5] Companies often receive paper invoices from trading partners. Paper invoices may require manual processing and are therefore subject to processing errors and delays. E-invoicing, in contrast, can be received and paid by automated processes. While e-invoicing is gaining momentum in other jurisdictions, e-invoicing represented only 25 percent of invoices in the United States as of 2019.[6] This relatively low number compared to other markets can be attributed to technical hurdles including the existing IT infrastructure and fragmented ecosystems supporting e-invoice delivery.[7]

A B2B registry could facilitate information lookup and e-invoice exchange across a fragmented landscape.[8] The registry would allow a business or its service provider to discover important information about the e-invoice processing capability of a recipient, including what types of documents the recipient can receive, in what format, and with which service provider. Figure 2 highlights how the directory could allow a user to discover e-invoicing information in the proposed "four-corner network" (that is, the business, access point A, access point B, and the customer) being considered by industry.[9] The B2B registry could connect different service metadata publishers (SMPs).[10] The SMPs maintain the information about which service provider works with the target business to receive the e-invoice or other electronic document like payment remittance information. This model allows SMPs to maintain the metadata of their customers, providing localization of data.

Figure 2. Stylized process flow for queries to B2B e-invoice registry

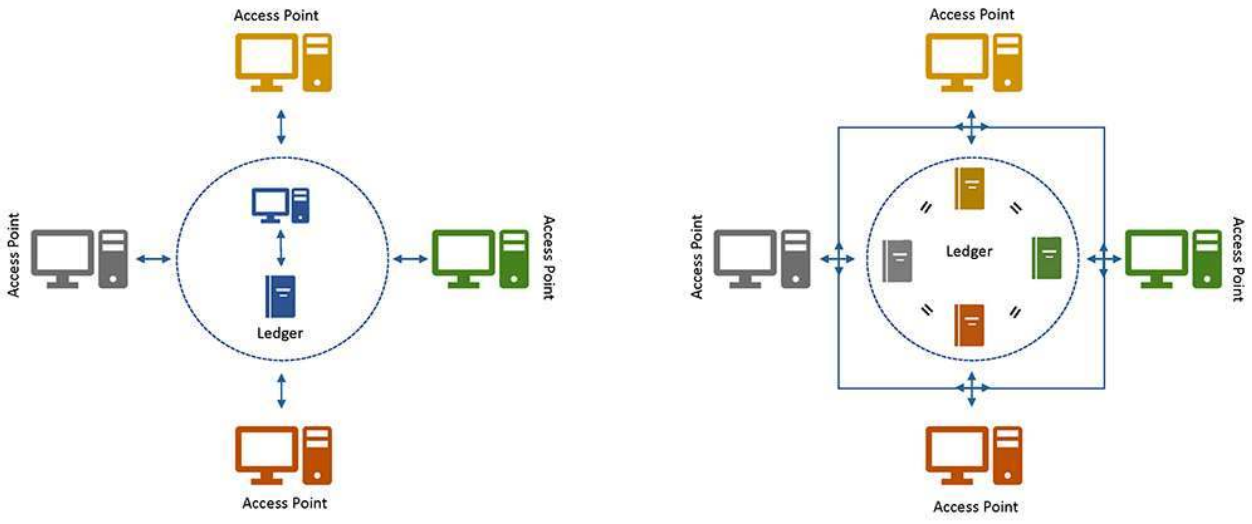


Accessible version

DLT for decentralized and distributed recordkeeping

DLT provides a different way to maintain records, which could be especially useful in certain circumstances. While traditional technologies for recordkeeping rely on a central entity managing updates to a single ledger, DLT enables the management of synchronized ledger copies by multiple participants in a network.[11] Participants can simultaneously propose, validate, and record updates, also called "state changes," to the network's distributed ledger. State changes are often made by grouping changes in a batched transaction referred to as a block, with new blocks including references to their preceding blocks in a data structure known as a blockchain.[12] State changes are replicated across the entire network, creating a resilient shared database. Figure 3 shows how a distributed ledger differs from a traditional one.

Figure 3. Traditional vs distributed ledger



Note: The distributed ledger diagram is modified from CPMI (2017).

Accessible version

DLT systems can be open (that is, permissionless) or closed (permissioned) networks. In a permissionless network, anyone can participate in the network's activities. There is no central entity managing the arrangement, and all participants have the same rights to update the DLT's ledger. In a permissioned system, only authorized users can update the ledger. Authorization is typically managed by some administrator that serves as a gatekeeper for the network. The gatekeeper could also assign different roles in the arrangement (for example, deciding which participants can submit transactions, which can validate transactions, and which can only look up information).

DLT leverages several technologies to create a synchronized authoritative ledger. Authorized participants (or nodes) submit transactions, commonly known in DLT as "proposed state changes," to the network by cryptographically signing the transaction.[13] The signed transactions are then broadcast to all the nodes in the network for processing and replication. This processing and replication are performed using an agreed-upon method for achieving consensus from participating nodes that the transaction can now be added to the shared ledger. State changes to the ledger are transparent to all network participants. In some cases, such as when the ledger is publicly available, state changes to the ledger are available to everyone.

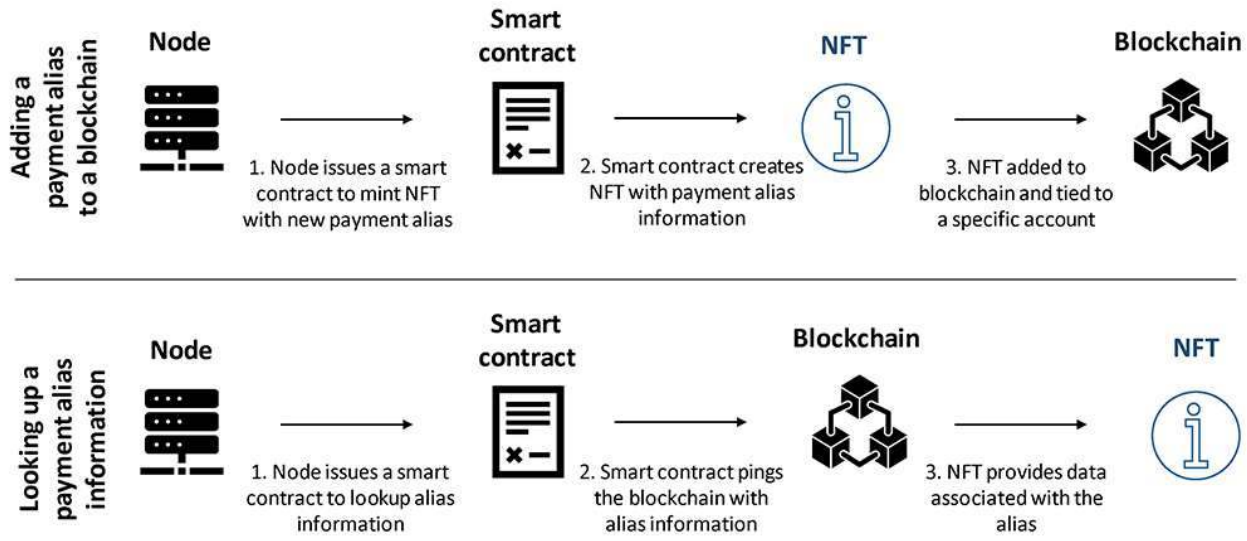
Using DLT for directory services

Given the fragmentation of payment directories in the United States, decentralized recordkeeping could be an attractive proposition for the development of a common directory. A universal directory could be operated jointly by directory service providers and all related payments information would be stored within a single database. For example, a telephone number or email address in the directory would contain the payees name, bank routing number, and bank account number. Alternatively, a federated directory could support a "directory of directories." For example, looking up a telephone number would direct users to a second, proprietary database containing payment-related information.

A stylized system design option

There are many designs that support the use of DLT in building a decentralized recordkeeping solution to facilitate the exchanges of information needed prior to routing a payment or invoice. One novel design to support recordkeeping for payment alias and business remittance information involves the use of smart contracts and tokens. A smart contract is a collection of code that executes the contract's functions and the data that represents its state on a blockchain. A token, in this context, is a representation of data that has been created by the smart contract on the blockchain. Figure 4 provides a high-level schematic of how such a recordkeeping arrangement could work.

Figure 4. Stylized process flows for a payment alias non-fungible token on a blockchain



Accessible version

In the schematic above, a user initiates a smart contract, through a network participant (or node). The smart contract would create a unique cryptographic element on the blockchain.[14] This unique cryptographic element, known as a non-fungible token or "NFT," is a representation of a payment alias, like an email address, phone number, or other identifier.[15] A service provider or even an individual could own these NFTs, depending on the design of the system. Changes to the underlying information in an NFT can be managed by a similar process using smart contracts. This would allow for an up-to-date record of payment information being available for all participants with the appropriate credentials to view them. Smart contracts would also be used to look up alias information on the blockchain.

Creating, modifying, and burning an NFT on the blockchain may incur a small transaction fee depending on design. For public blockchains, creating, modifying, and burning an NFT would involve computation on the blockchain. Such activity could be subject to a "gas fee," which is akin to a transaction fee for the processing of the smart contract. Lookup of information on a blockchain would likely not incur any fee because (1) the information may be public information or (2) the lookup function does not require computation in effecting the smart contract to lookup information. Permissioned systems can also disable gas fees if desired or charge transaction fees using a different mechanism.

Key decision points in system design

Designing a DLT-based directory service will involve a number of key decisions. Perhaps first and foremost is deciding whether the system will be permissioned or permissionless. In permissioned systems, key decisions are needed on different roles and responsibilities of participants. This determination will have significant impact on the design of the system, its foundational technology, its functionality, and its risk profile. A permissioned system, for example, would likely require a central administrator to control access to the network. A permissionless system would not require a central administrator but would require a consensus mechanism for synchronizing the ledger.

A second set of key decisions is who can propose and validate state changes to the ledger, what data are maintained on the ledger, and who can see the ledger. In some use cases,

participants may prefer a public information arrangement in which information is readily accessible to everyone (such as for domain name systems). In other cases, participants may choose to limit sharing of personally identifiable information (such as telephone-based alias information) or other sensitive information (such as individual bank account information). The use case, along with industry preferences, will determine the degree of transparency and openness of the underlying data. Technology can accommodate a range of industry preferences on data transparency.

An equally important design decision for any DLT system is governance, particularly for a system that may effectively serve as an industry-operated utility. Where there is a central authority or administrator, typically needed for a permissioned system, governance of that entity can be supported through a board of directors, a management committee, and an auditing firm. For a permissionless system, governance may become much more challenging. An industry collective or "advisory" committee may be able to provide some degree of coordination among stakeholders. For payment directories, decentralized arrangements – regardless of whether they are permissioned or permissionless – may benefit from an industry body to provide governance of the arrangement.

There are other design considerations for the use of DLT for directories. Some considerations include whether to use smart contract events to enable participants to "listen" for or receive notifications of directory updates or certain relevant activity. This feature, for example, can alert participants in an information exchange that action is needed on their part to complete relevant activity in progress. How maintenance of the directory metadata will be performed is another important consideration. For example, if an end user is moving their account and alias to a new provider, will the initial provider update the record with the new provider's information and then seek a user authorization? Or will the new provider initiate a transfer of the record and seek user authentication? These and other questions require further exploration.

Conclusion

DLT allows for a rethinking of how information is kept, shared, and managed. Despite the potential power of this technology, it has not been widely adopted in the financial sector or elsewhere. This is in part because DLT was built for a specific purpose for which they may not be many practical use cases. And where some deployments exist, the arrangements require tremendous resources to maintain. The payment directory and registry landscapes, however, offer areas for potential exploration, because decentralized management and use of high perceived value data assets to support a common directory may be useful and indeed may increase efficiency of the ecosystem. The information exchanges associated with a payment alias directory or a business registry could capitalize on DLT's capabilities to promote secure, efficient, exchanges of information that result in a higher level of data integrity.

References

Bijlsma, Michiel, Harro Boven, Carin van der Cruijsen, and Marc van der Maarel (2020), *Lowering switching barriers in the Dutch payment system: no number portability, but use of alias?* (PDF) , Amsterdam: De Nederlandsche Bank.

Business Payments Coalition (2019), *Overview of e-Invoice Interoperability Framework* (PDF) , November.

Business Payments Coalition (2021), *e-Invoice Exchange Framework: Approach to Managing a Federated Registry Services Model in a Four Corner Network* (PDF) , March.

Committee on Payments and Market Infrastructures (2017), *Distributed ledger technology in payment, clearing, and settlement* (PDF) , Basel: Bank for International Settlements, February.

Hers, Johannes, Ward Rougoor, and Marilou Vlaanderen (2020), *Costs and benefits of alias use in the payment system* (PDF) , Amsterdam: SEO, March.

Mills, David, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), "Distributed ledger technology in payments, clearing, and settlement ," *Finance and Economics Discussion Series* 2016-095, Washington: Board of Governors of the Federal Reserve System.

Payments, Standards and Outreach Group (2016), *U.S. Adoption of Electronic Invoicing: Challenges and Opportunities* (PDF) , Minneapolis: Federal Reserve Bank of Minneapolis, June 30.

Yaga, Dylan, Peter Mell, Nik Roby, and Karen Scarfone (2018), *Blockchain Technology Overview* (PDF), Gaithersburg, MD: National Institute of Standards and Technology, October.

---

1. The views expressed in this paper are solely those of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System. The authors would like to thank Guy Berg, Todd Albers, and Angela N Lawson of the Federal Reserve Bank of Minneapolis; Alexander Lee of the Federal Reserve Bank of New York; and David Mills, Katya Delak, Jillian Mascelli, Kirstin Wells, and Sarah Wright of the Federal Reserve Board for their contributions to and assistance with this note. Return to text

2. For additional information on DLT, see, for example, Yaga et al. (2018) and Mills et al. (2016). Return to text

3. Today, Zelle has more than 1,000 banks in its network with over 100 million customers. See https://www.zellepay.com/partners. Return to text

4. For a discussion on the use of payment aliases and bank switching costs in the Netherlands, see Hers, Rougoor, and Vlaanderen (2020) and Bijlsma et al (2020). Return to text

5. Payments, Standards and Outreach Group (2016). Return to text

6. Business Payments Coalition (2019). Return to text

7. Payments, Standards and Outreach Group (2016). Return to text

8. Fragmentation occurs when different customers use different systems that are non-interoperable. Trading partners belonging to different systems must then choose between subscribing to multiple systems to achieve electronic transmission of the information or make other arrangements. Return to text

9. For additional information on the "four-corner network" being proposed by industry, see Business Payments Coalition (2021). Return to text

10. In a four-corner model, an SMP maintains information on a participant's e-invoicing capabilities. The metadata could include information about business document types and formats that the participant can receive electronically, their business processes, and what information it expects to receive within a certain business document. The metadata could also include information about the technical endpoints and transport protocols where the participant can receive business documents. Return to text

11. Distributed ledger designs can vary significantly based on the use case. For example, a distributed ledger could also be operated by a central entity that maintains all copies of the ledger. Return to text

12. As more blocks are added to the blockchain it becomes more difficult to modify information in a previous block. This difficulty of modifying previously recorded information holds under certain algorithms for achieving consensus on the canonical set of blocks, notably proof-of-work in a public context. Other consensus algorithms may make changes to historical blocks similarly evident but will not make the changes difficult to perform. In addition, a permissioned ledger with a single administrator (or small set of administrators) may be unilaterally revised by those administrators regardless of the consensus algorithm used by the ledger, though this may again be evident to any participant replicating previous versions of the ledger locally. Return to text

13. A cryptographic signature provides other participants a mechanism to verify the integrity and authenticity of the transaction. Return to text

14. Not all blockchains support the issuance and use of NFTs. More-popular blockchain solutions that do include the Ethereum, Quorum, and Solana networks. Return to text

15. Although every NFT is unique, its contents are not necessarily unique. For example, there could be two NFTs for the same payment alias. Additional programming would be required to ensure that there is only NFT per payment alias. That is, each payment alias would have only one NFT. Return to text

Please cite this note as:

Lone, Peter, Kumar Nagarajan, Trish Supples, and Paul Wong (2021). "Using Distributed Ledger Technology for Payment Directories," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, February 03, 2022, https://doi.org/10.17016/2380-7172.3042.

Disclaimer: *FEDS Notes are articles in which Board staff offer their own views and present analysis on a range of topics in economics and finance. These articles are shorter and less technically oriented than FEDS Working Papers and IFDP papers.*

Last Update: February 03, 2022

An official website of the United States government Here's how you know

Electronic Invoicing (E-Invoicing)

The Office of Management and Budget (OMB) Memorandum 15-19, Improving Government Efficiency and Saving Taxpayer Dollars Through Electronic Invoicing directs agencies to manage invoices for federal procurements electronically.

Vendors must have the option to submit their invoices electronically (Government Paperwork Elimination Act). One way of doing this is by using a Federal Shared Service Provider (FSSP) that offers e-invoicing.

The problem FIT was solving

The Department of the Treasury was looking for a more efficient and transparent way to handle invoicing for both federal agencies and commercial suppliers rather than for them to continue sending, receiving, and processing paper.

The benefits of FIT's solution

E-invoicing is part of the solution FIT helped with and promoted for agencies to use FSSPs.

E-invoicing helps agencies in these ways:

- Vendors are responsible for entering invoices and increasing accuracy.
- Processing invoices is more efficient with less manual work, fewer steps, and no routing of paper or e-mails for approval.
- Agencies don't have to develop or maintain individual systems.

This service also helps the federal government as a whole because it:

- promotes greater efficiency and transparency, supporting Executive Order 13576 to cut waste
- reduces the cost and inefficiency of developing and maintaining individual agency solutions

- makes it easier for vendors to do business with the government by having a common portal for them to use
- saves the government up to $450 million per year (a 25% - 45% savings per invoice by moving from a primarily paper-based system to full electronic invoicing)
- centralizes invoice information and related payment data, giving earlier and greater visibility into how agencies spend their money
- improves the Department of the Treasury's cash management
- allows more accurate financial reporting for everyone, including the public

Last Updated: February 25, 2026

Center for Financial Management

System Solutions for Federal Program Agencies and Financial Institutions

FM Marketplace of Systems, Services, and Solutions

Related Links

OMB 16-11, Improving Administrative Functions Through Shared Services

Circular No. A-123 Appendix D, Compliance with the Federal Financial Management...

OMB M 13-08, Improving Financial Systems Through Shared Services

OMB M 10-26, Immediate Review of Financial Systems IT Projects

Contact Us

@ Financial Innovation & Transformation (FIT)

fit@fiscal.treasury.gov

fiscal.treasury.gov

An official website of the U.S. Department of the Treasury

Have a question about government services? Contact USA.gov

EXPLORE AND SIGN UP

Our in-person and virtual events provide learning opportunities for fiscal-related topics.

Our FAQs have extensive lists for what you can do and where you can find it.

CONTACT US

Visit our Contacts page to find the resources you need.

Still can't find what you're looking for?

Submit a Request Form

EXPLORE OUR PARTNER SITES

Our partner sites provide additional stats and public information.

FiscalData.treasury.gov

TFX.treasury.gov

Treasury Direct

USASpending.gov

Accessibility • Data Quality • FOIA • No Fear Act • Privacy Impact Assessments • Privacy Policy

© 2026 Bureau of the Fiscal Service

An official website of the United States government Here's how you know

Invoice Processing Platform

The Invoice Processing Platform (IPP) is a secure, web-based, centralized program through which federal agencies better manage the invoicing process for goods and services, from purchase order to payment notification. The Bureau of the Fiscal Service provides this program at no cost to federal agencies and their vendors. Learn more, at https://www.ipp.gov.

Why use IPP?

It saves money.

- One federal agency using IPP has already reduced the cost of processing undisputed invoices by 54% and disputed invoices by 43%.
- In the 2017 *Business Case for E-Invoicing*, Bruno Koch of Billentis estimates electronic invoicing saves 59% of the cost of processing an invoice.

Read more success stories at ipp.gov

What can agencies and vendors do in IPP?

As a federal agency, you can

- make purchase orders available to vendors from your system
- give the vendor access to the purchase order
- manage invoice approval processes electronically, which can help you pay on time and avoid Prompt Payment penalties
- exchange files directly from Oracle, SAP, Momentum, and other financial systems

As a vendor, you can

- submit invoices to enrolled agencies in several ways
- check the status of an invoice or payment
- receive payment details including Treasury offset information

Read more about the features and benefits of IPP at ipp.gov

IPP Training

We offer financial education and support to federal employees and agency customers through customer forums, in-person and web-based training sessions, and conferences.

Upcoming Training

Stay Up to Date with IPP

Subscribe to email notifications and get IPP news and updates delivered right to your inbox!

Join the Mailing List

Selecting this button generates an e-mail message with everything filled in — just send the message. You will receive a confirmation message from the list in 15 minutes – reply to the message.

Contact the IPP team

To get help with IPP, contact IPP Customer Support

Standard Operating Hours
8:00 AM to 6:00 PM (Eastern Time)
Monday – Friday (except federal holidays)

Contact Method
Agency Support E-mail:
IPPAgencySupport@fiscal.treasury.gov

Vendor Support E-mail:
IPPCustomerSupport@fiscal.treasury.gov
Telephone:
1-866-973-3131

For Requests Submitted Outside of Standard Operating Hours:
IPP Customer Support staff will respond in the order the inquiries are received.

Last Updated: March 26, 2026

- Programs
- **Payment Systems and Services**
  - Automated Standard Application for Payments (ASAP)
  - Federal Disbursement Services (FDS)
  - International Treasury Services
  - Payment Automation Manager (PAM)
  - Secure Payment System (SPS)
  - **Invoice Processing Platform**
- Payments of Claims
- Post-Payment Systems
- Payments Guidance

Related Links

IPP Training

Pay.gov

Card Acquiring Services (CAS)

OTCnet

Search the Financial Management (FM) Marketplace

Contact Us

Invoice Processing Platform (IPP)

IPPAgencySupport@fiscal.treasury.gov

IPPCustomerSupport@fiscal.treasury.gov

866-973-3131

Subscribe to IPP

fiscal.treasury.gov
An official website of the U.S. Department of the Treasury

Have a question about government services? Contact USA.gov

EXPLORE AND SIGN UP

Our in-person and virtual events provide learning opportunities for fiscal-related topics.

Our FAQs have extensive lists for what you can do and where you can find it.

CONTACT US

Visit our Contacts page to find the resources you need.

Still can't find what you're looking for?

Submit a Request Form

EXPLORE OUR PARTNER SITES

Our partner sites provide additional stats and public information.

FiscalData.treasury.gov

TFX.treasury.gov

Treasury Direct

USASpending.gov

Accessibility • Data Quality • FOIA • No Fear Act • Privacy Impact Assessments • Privacy Policy

© 2026 Bureau of the Fiscal Service

Census Bureau Reports Shipment of U.S. Goods Reached 12.2 Billion Tons and $18.0 Trillion

June 26, 2025
Press Release Number: CB25-TPS.47

Trucks Carried Most of the Load, Hauling 68.1% of Total Tonnage in 2022

JUNE 26, 2025 — Shipments of goods in the United States reached 12.2 billion tons in 2022, virtually unchanged from 2017, according to the latest Commodity Flow Survey [https://www.census.gov/data/tables/2022/econ/cfs/aff-2022.html] estimates released today by the U.S. Census Bureau. The total value of shipments nationwide over the five-year span increased $3.5 trillion (24.0%) to $18.0 trillion (not adjusted for inflation or seasonality).



[https://www.census.gov/content/dam/Census/library/visualizations/2025/comm/cfs-shipment-of-goods.jpg]

Customer Pickup – a newly tabulated mode estimate in 2022 – accounted for 1.4 billion tons of U.S. goods shipped (about 11.4% of

the total tonnage) in 2022, valued at $1.0 trillion.

Additional highlights:

- The South region shipped 1.9 billion tons (40.4%) of U.S. goods in 2022, valued at $6.7 trillion. The Midwest followed with 3.4 billion tons (28.1%) of goods shipped, valued at $4.8 trillion.
- Manufacturing establishments shipped 4.9 billion tons of commodities worth $7.1 trillion in 2022. Wholesale establishments shipped 4.1 billion tons of commodities worth $8.1 trillion.
- Trucks as a single domestic mode of transportation hauled approximately 8.3 billion tons (68.1%) of the total tonnage. These shipments accounted for $13.2 trillion (73.5%) of the total value of commodities shipped in 2022.
- An estimated 56.4% of all tonnage traveled less than 50 miles in 2022.
- Trucks carried the largest share (49.6%) of tonnage traveling to Canada.
- Hazardous material shipments weighed 2.6 billion tons and accounted for $2.1 trillion in 2022.

About the Commodity Flow Survey

The Commodity Flow Survey was initiated in 1993 and has been conducted every five years since 1997 as part of the Census Bureau's economic census. The survey, a partnership with the U.S. Department of Transportation's Bureau of Transportation Statistics, is the primary source of national, state and selected metropolitan area statistics on domestic freight shipments. It provides information on the origin and destination, value, weight, mode of transportation and distance of commodities shipped.

The CFS provides estimates for the nation, the 50 states and the District of Columbia and selected metropolitan areas.

Policymakers and transportation planners in various federal, state and local agencies use CFS statistics to assess the demand for transportation facilities and services, energy use and safety risk and environmental concerns. A sample of approximately 165,000 establishments are selected based on geographic location and industry.

The Commodity Flow Survey does not include establishments classified in forestry, fishing, utilities, construction, transportation and most retail and services industries. Farms and government-owned entities (except government-owned liquor wholesalers) are also excluded. The survey does not capture information on imports to the United States; however, domestic portions of imported shipments can be included if they pass through a sampled establishment.

Statistics are based on data from the 2022 and 2017 Commodity Flow Surveys and include data only for businesses with paid employees. All dollar values are expressed in current dollars for the period shown, i.e., they are not adjusted for inflation and do not reflect changes in prices. For more information (including definitions and information on comparability, confidentiality protection and

sampling and nonsampling error), refer to the Commodity Flow Survey methodology [https://www.census.gov/programs-surveys/cfs/technical-documentation/methodology.html]
.

All comparisons made in this release have been tested and found to be statistically significant at the 90% confidence level, unless otherwise noted. All estimates include measures of sampling variability.

For more information, visit the Commodity Flow Survey [https://www.census.gov/programs-surveys/cfs.html] website.

No news release associated with these products. Tip sheet only.

###

Contact

Kristina Barrett
Public Information Office
301-763-3030 or
877-861-2010 (U.S. and Canada only)
pio@census.gov

Page Last Revised - June 26, 2025

Management Analysts

Summary



Employment of management analysts is projected to grow 9 percent from 2024 to 2034, much faster than the average for all occupations.

About 98,100 openings for management analysts are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire.

State & Area Data

Explore resources for employment and wages by state and area for management analysts.

Similar Occupations

Compare the job duties, education, job growth, and pay of management analysts with similar occupations.

More Information, Including Links to O*NET

Learn more about management analysts by visiting additional resources, including O*NET, a source on key characteristics of workers and occupations.

What They Do ->

What Management Analysts Do



Although some management analysts work for the company that they are analyzing, most work as consultants on a contractual basis.

Management analysts, often called *management consultants*, recommend ways to improve an organization's efficiency. They advise managers on how to make organizations more profitable through reduced costs and increased revenues.

Duties

Management analysts typically do the following:

- Gather and organize information about the problems to be solved or the procedures to be improved
- Interview personnel and conduct onsite observations to determine the methods, equipment, and personnel that will be needed
- Analyze financial and other data, including revenue, expenditure, and employment reports
- Develop solutions or alternative practices
- Recommend new systems, procedures, or organizational changes
- Make recommendations to management through presentations or written reports
- Confer with managers to ensure changes are working

Although some management analysts work for the organization that they analyze, many work as consultants on a contractual basis.

The work of management analysts may vary from project to project. Some projects require a team of analysts, each specializing in one area. On other projects, analysts work independently with the client organization's managers.

Management analysts often specialize in certain areas, such as inventory control or reorganizing corporate structures for efficiency. Some focus on a specific industry, such as healthcare or telecommunications. In government, management analysts usually specialize by type of agency.

Organizations hire management analysts to develop strategies for entering and remaining competitive in the market.

Management analysts who work on contract may write proposals and bid for jobs. Typically, an organization that needs the help of a management analyst requests proposals from a number of consultants and consulting companies that specialize in the needed work. Interested companies then submit a proposal that explains details such as how the work will be completed, what the schedule will be, and how much it will cost. The organization selects the proposal that best meets its needs and budget.

<- Summary

Work Environment ->

Work Environment



Because they must spend a significant portion of their time with clients, analysts travel frequently.

Management analysts held about 1.1 million jobs in 2024. The largest employers of management analysts were as follows:

Professional, scientific, and technical services	34%
Government, excluding state and local education and hospitals	17
Self-employed workers	14
Finance and insurance	13
Management of companies and enterprises	4

Management analysts usually divide their time between their offices and the client's site. Because they must spend a significant amount of time with clients, analysts travel frequently. Analysts may experience stress, especially when trying to meet a client's demands on a tight schedule.

Work Schedules

Analysts often work many hours under tight deadlines. Some work more than 40 hours per week.

<- What They Do

How to Become One ->

How to Become a Management Analyst



A bachelor's degree is the typical entry-level requirement for obtaining a management analyst position.

Management analysts typically need at least a bachelor's degree and several years of related work experience.

Education

A bachelor's degree is the typical entry-level requirement for management analysts. However, some employers prefer to hire candidates who have a master's degree in business administration (MBA).

Management analysts address a range of topics, and many fields of study provide a suitable educational background. Fields of bachelor's degree study may include business, social science, and engineering.

Licenses, Certifications, and Registrations

Management analysts are not required to get certification, but having a credential may give jobseekers a competitive advantage. Information on certifications is available from CareerOneStop.

Work Experience in a Related Occupation

Many analysts enter the occupation with several years of work experience. Organizations that specialize in certain fields typically try to hire candidates who have experience in those areas. For example, tax preparation firms may prefer candidates who have worked as an accountant or auditor, and software companies might seek those with experience as a computer systems analyst.

Advancement

As management analysts gain experience, they often take on more responsibility. Senior-level analysts may supervise teams working on complex projects and may become involved in seeking out new business. Those with exceptional skills may eventually become partners in their organization and focus on attracting new clients and bringing in revenue. Senior analysts may leave consulting and move to management positions at non-consulting organizations.

Important Qualities

The following are examples of qualities that are important for these workers to perform their duties. For more information, visit the Employment Projections (EP) skills data page.

Analytical skills. Management analysts must be able to interpret information and use their findings to make proposals.

Communication skills. Management analysts must be able to convey information clearly in both writing and speaking. Analysts also need good listening skills to understand an organization's problems and recommend appropriate solutions.

Interpersonal skills. Management analysts work with managers and other employees of the organizations for which they provide consulting services. They should be able to work as a team toward achieving the organization's goals.

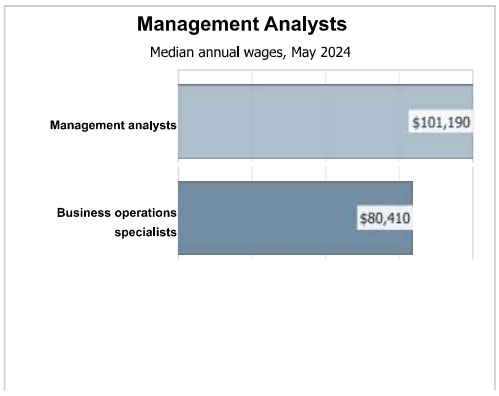
Problem-solving skills. Management analysts must be able to think creatively to solve clients' problems. Although some aspects of clients' problems may be similar, each situation is likely to present unique challenges for the analyst to solve.

Time-management skills. Management analysts often work under tight deadlines and must use their time efficiently to complete projects on schedule.

<- Work Environment

Pay ->

Pay





Note: All Occupations includes all occupations in the U.S. Economy.
Source: U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics

The median annual wage for management analysts was $101,190 in May 2024. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than $59,720, and the highest 10 percent earned more than $174,140.

In May 2024, the median annual wages for management analysts in the top industries in which they worked were as follows:

Professional, scientific, and technical services	$107,790
Management of companies and enterprises	101,560
Finance and insurance	98,710
Government, excluding state and local education and hospitals	94,080

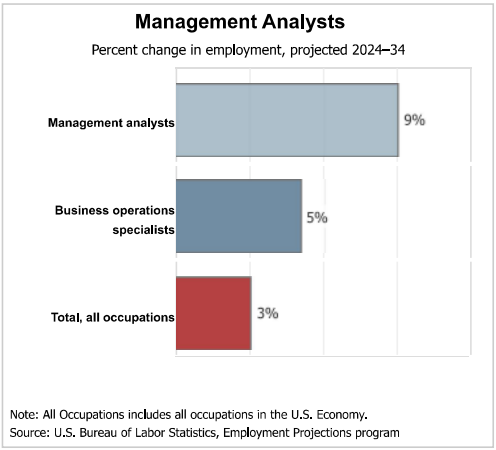
Management analysts working for consulting firms are usually paid a base salary in addition to a year-end bonus. Self-employed analysts are paid directly by their clients, typically by either the hour or the project.

Analysts often work many hours under tight deadlines. Some work more than 40 hours per week.

<- How to Become One

Job Outlook ->

Job Outlook



Note: All Occupations includes all occupations in the U.S. Economy.
Source: U.S. Bureau of Labor Statistics, Employment Projections program

Employment of management analysts is projected to grow 9 percent from 2024 to 2034, much faster than the average for all occupations.

About 98,100 openings for management analysts are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire.

Employment

Demand for consulting services is expected to increase as organizations seek ways to improve efficiency and control costs. As markets become more competitive, firms will need to use resources more efficiently.

Growth is expected to be particularly strong in smaller consulting companies that specialize in specific industries or types of business function, such as information technology or human resources. Government agencies also are expected to seek the services of management analysts as they look for ways to reduce spending and improve efficiency.

Employment projections data for management analysts, 2024–34

Management analysts

SOC Code:
13-1111

Employment, 2024:
1,075,100

Projected Employment, 2034:
1,169,700

Change, 2024–34 (Percent):
9

Change, 2024–34 (Numeric):
94,500

Employment By Industry:
Get data

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

State & Area Data

Occupational Employment and Wage Statistics (OEWS)

The Occupational Employment and Wage Statistics (OEWS) program produces employment and wage estimates annually for over 800 occupations. These estimates are available for the nation as a whole, for individual states, and for metropolitan and nonmetropolitan areas. The link below goes to OEWS data maps for employment and wages by state and area. Use the dropdown boxes to select an occupation.

Occupational Employment and Wage Statistics (OEWS) Profiles

Projections Central

Occupational employment projections are developed for all states by Labor Market Information (LMI) or individual state Employment Projections offices. All state projections data are available at www.projectionscentral.org. Information on this site allows projected employment growth for an occupation to be compared among states or to be compared within one state. In addition, states may produce projections for areas; there are links to each state's websites where these data may be retrieved.

CareerOneStop

CareerOneStop includes hundreds of occupational profiles with data available by state and metro area. There are links in the left-hand side menu to compare occupational employment by state and occupational wages by local area or metro area. There is also a salary info tool to search for wages by zip code.

<- Job Outlook

Similar Occupations ->

Similar Occupations

This table shows a list of occupations with job duties that are similar to those of management analysts.

Accountants and Auditors

Job Duties:
Accountants and auditors prepare and examine financial records.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$81,680

Administrative Services and Facilities Managers

Job Duties:
Administrative services and facilities managers plan, direct, and coordinate activities that help an organization run efficiently.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$106,880

Budget Analysts

Job Duties:
Budget analysts help public and private organizations plan their finances.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$87,930

Cost Estimators

Job Duties:
Cost estimators collect and analyze data in order to assess the time, money, materials, and labor required to make a product or provide a service.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$77,070

Economists

Job Duties:
Economists conduct research, prepare reports, and evaluate issues related to monetary and fiscal policy. They also may collect and analyze statistical data.

Entry-Level Education:
Master's degree

2024 Median Pay:
$115,440

Financial Analysts

Job Duties:
Financial analysts guide businesses and individuals in decisions about expending money to attain profit.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$101,910

Financial Managers

Job Duties:
Financial managers create financial reports, direct investment activities, and develop plans for the long-term financial goals of their organization.

Entry-Level Education:

Bachelor's degree

2024 Median Pay:
$161,700

Market Research Analysts

Job Duties:
Market research analysts study consumer preferences, business conditions, and other factors to assess potential sales of a product or service.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$76,950

Operations Research Analysts

Job Duties:
Operations research analysts use mathematics and logic to help solve complex issues.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$91,290

Project Management Specialists

Job Duties:
Project management specialists coordinate the budget, schedule, staffing, and other details of a project.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$100,750

<- State & Area Data

More Info ->

Contacts for More Information

For information about certifications, visit CareerOneStop.

O*NET

Management Analysts

<- Similar Occupations

SUGGESTED CITATION:

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Management Analysts, at https://www.bls.gov/ooh/business-and-financial/management-analysts.htm (visited *June 22, 2026*).

Last modified date: August 28, 2025

U.S. BUREAU OF LABOR STATISTICS Occupational Outlook Handbook Office of Employment and Unemployment Statistics Suitland Federal Center Floor 3 4600 Silver Hill Road Washington, DC 20212-0002

Telephone: 202-691-5700 www.bls.gov/ooh Contact OOH

O*NET OnLine

Management Analysts

13-1111.00

Bright Outlook | Updated 2026

Conduct organizational studies and evaluations, design systems and procedures, conduct work simplification and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Includes program analysts and management consultants.

Sample of reported job titles: Administrative Analyst, Business Analyst, Business Consultant, Employment Programs Analyst, Management Analyst, Management Consultant, Organizational Development Consultant, Performance Management Analyst, Program Management Analyst

Summary | Details | Custom | Easy Read | Veterans | Español

Contents

Occupation-Specific Information

Tasks

5 of 11 displayed

- Gather and organize information on problems or procedures.
- Confer with personnel concerned to ensure successful functioning of newly implemented systems or procedures.
- Analyze data gathered and develop solutions or alternative methods of proceeding.
- Document findings of study and prepare recommendations for implementation of new systems, procedures, or organizational changes.
- Plan study of work problems and procedures, such as organizational change, communications, information flow, integrated production methods, inventory control, or cost analysis.

Occupational Requirements

Work Activities

5 of 30 displayed

- **Getting Information** — Observing, receiving, and otherwise obtaining information from all relevant sources.

- **Communicating with Supervisors, Peers, or Subordinates —** Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- **Establishing and Maintaining Interpersonal Relationships —** Developing constructive and cooperative working relationships with others, and maintaining them over time.
- **Making Decisions and Solving Problems —** Analyzing information and evaluating results to choose the best solution and solve problems.
- **Providing Consultation and Advice to Others —** Providing guidance and expert advice to management or other groups on technical, systems-, or process-related topics.

Detailed Work Activities

5 of 14 displayed

- Confer with personnel to coordinate business operations.
- Gather organizational performance information.
- Analyze business or financial data.
- Advise others on business or operational matters.
- Prepare research reports.

Work Context

5 of 19 displayed

- **E-Mail** — 100% responded "Every day."
- **Telephone Conversations —** 89% responded "Every day."
- **Face-to-Face Discussions with Individuals and Within Teams —** 74% responded "Every day."
- **Determine Tasks, Priorities and Goals —** 50% responded "A lot of freedom."
- **Work With or Contribute to a Work Group or Team —** 50% responded "Extremely important."

Experience Requirements

Job Zone

Title	Job Zone Four: Considerable Preparation Needed
Education	Most of these occupations require a four-year bachelor's degree, but some do not.
Related Experience	A considerable amount of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.
Job Training	Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.
Job Zone Examples	Many of these occupations involve coordinating, supervising, managing, or training others. Examples include real estate brokers, sales managers, database

administrators, graphic designers, conservation scientists, art directors, and cost estimators.

SVP Range (7.0 to < 8.0)

Training & Credentials

State training Select a State Go

Local training ZIP Code Go

Certifications Find certifications nationwide

State licenses Select a State Go

Apprenticeship Opportunities

5 of 6 displayed

Example apprenticeship titles for this occupation:

- Business Analyst
- Government Policy Advisor
- Health Information Management Business Analyst
- Health Information Management Data Analyst
- Management Systems Auditor

Specific title(s) listed above are vetted by industry and approved by the U.S. Department of Labor for use in a Registered Apprenticeship Program.

Start your career and build your skillset. Visit **Apprenticeship.gov** to learn about opportunities related to this occupation.

Worker Requirements

Software Skills

5 of 59 displayed

- **Data base user interface and query software** — Airtable; Blackboard software; MySQL 🔥; Transact-SQL 🔥
- **Development environment software** — Apache Kafka 🔥; Apache Maven 🔥; Go 🔥; Microsoft PowerShell 🔥
- **Enterprise resource planning ERP software** — Microsoft Dynamics; NetSuite ERP; Oracle Hyperion; SAP software 🔥

- **Object or component oriented development software —** C# 🔥; jQuery 🔥; Scala 🔥; Swift 🔥
- **Web platform development software —** Apache Tomcat 🔥; Google Angular 🔥; Microsoft ASP.NET 🔥; Spring Framework 🔥

Hot Technologies are requirements most frequently included across all employer job postings.
See all 104 Hot Technologies for this occupation.

In Demand skills are frequently included in employer job postings for this occupation.
See all 11 In Demand skills for this occupation.

Essential Skills

5 of 9 displayed

- **Active Listening —** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Critical Thinking —** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
- **Reading Comprehension —** Understanding written sentences and paragraphs in work-related documents.
- **Speaking —** Talking to others to convey information effectively.
- **Writing —** Communicating effectively in writing as appropriate for the needs of the audience.

Transferable Skills

5 of 13 displayed

- **Complex Problem Solving** — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
- **Judgment and Decision Making —** Considering the relative costs and benefits of potential actions to choose the most appropriate one.
- **Coordination —** Adjusting actions in relation to others' actions.
- **Social Perceptiveness —** Being aware of others' reactions and understanding why they react as they do.
- **Systems Evaluation** — Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

Knowledge

5 of 13 displayed

- **English Language —** Knowledge of the structure and content of the English language including the meaning and spelling of words, and rules of composition and grammar.
- **Administration and Management —** Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

- **Customer and Personal Service —** Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
- **Mathematics —** Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
- **Education and Training —** Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

Education

How much education does a new hire need to perform a job in this occupation? Respondents said:

57%	Bachelor's degree required
24%	Master's degree required
10%	Some college, no degree required

Worker Characteristics

Abilities

5 of 17 displayed

- **Oral Comprehension —** The ability to listen to and understand information and ideas presented through spoken words and sentences.
- **Oral Expression —** The ability to communicate information and ideas in speaking so others will understand.
- **Problem Sensitivity —** The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing that there is a problem.
- **Written Comprehension —** The ability to read and understand information and ideas presented in writing.
- **Deductive Reasoning —** The ability to apply general rules to specific problems to produce answers that make sense.

Interests

All 3 displayed

Interest code: **CIE**

Want to discover your interests? Take the **O*NET Interest Profiler**.

- **Conventional** — Work involves following procedures and regulations to organize information or data, typically in a business setting. Conventional occupations are often associated with office work, accounting, mathematics/statistics, information technology, finance, or human resources.
  - **Office Work —** Work involves clerical and administrative tasks for an organization such as answering phones, bookkeeping, updating records, scheduling appointments or meetings, and

editing of documents and files.

- **Investigative —** Work involves studying and researching non-living objects, living organisms, disease or other forms of impairment, or human behavior. Investigative occupations are often associated with physical, life, medical, or social sciences, and can be found in the fields of humanities, mathematics/statistics, information technology, or health care service.
- **Enterprising —** Work involves managing, negotiating, marketing, or selling, typically in a business setting, or leading or advising people in political and legal situations. Enterprising occupations are often associated with business initiatives, sales, marketing/advertising, finance, management/administration, professional advising, public speaking, politics, or law.
  - **Management/Administration —** Work involves planning, directing, or coordinating the daily operations of an organization, and overseeing personnel, business, or administrative services.
  - **Business Initiatives —** Work involves creating strategic plans or taking actions to expand an organization's business or market share.

Work Styles

5 of 8 displayed

- **Initiative —** A tendency to be proactive and take on extra responsibilities and tasks that may fall outside of one's required work role.
- **Innovation —** A tendency to be inventive, to be imaginative, and to adopt new perspectives on ways to accomplish work.
- **Adaptability —** A tendency to be open to and comfortable with change, new experiences, or ideas at work.
- **Achievement Orientation —** A tendency to establish and maintain personally challenging work-related goals, set high work-related standards, and exert high effort toward meeting those goals and standards.
- **Intellectual Curiosity —** A tendency to seek out and acquire new work-related knowledge and obtain a deep understanding of work-related subjects.

Workforce Characteristics

Wages & Employment Trends

Median wages (2025)	$48.97 hourly, $101,860 annual
State wages	Select a State Go
Local wages	ZIP Code Go
Employment (2024)	1,075,100 employees
Projected growth (2024-2034)	Much faster than average (7% or higher)

Projected job openings (2024-2034)	98,100
State trends	Select a State Go
Top industries (2024)	Professional, Scientific, and Technical Services Government

Source: Bureau of Labor Statistics 2025 wage data and 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2024-2034). "Projected job openings" represent openings due to growth and replacement.

Job Openings on the Web

State job openings	Select a State Go
Local job openings	ZIP Code Go

More Information

Related Occupations

5 of 10 displayed

- 15-1211.00 Computer Systems Analysts
- 15-2051.00 Data Scientists
- 15-1299.03 Document Management Specialists
- 15-1299.09 Information Technology Project Managers
- 13-1082.00 Project Management Specialists

Professional Associations

Disclaimer: Sources are listed to provide additional information on related jobs, specialties, and/or industries. Links to non-DOL Internet sites are provided for your convenience and do not constitute an endorsement.

National Associations

5 of 8 displayed

- American Society for Public Administration ALLY
- Association of Professional Business and Management Analysts ALLY
- Institute of Management Consultants USA ALLY
- Academy of Management
- AICPA and CIMA

Accreditation, Certification, & Unions

- International Institute of Business Analysis ALLY

- Institute of Management Accountants
- International Association of Law Enforcement Planners
- Project Management Institute

Computer Systems Analysts

Summary



Job Outlook

Employment of computer systems analysts is projected to grow 9 percent from 2024 to 2034, much faster than the average for all occupations.

About 34,200 openings for computer systems analysts are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire.

State & Area Data

Explore resources for employment and wages by state and area for computer systems analysts.

Similar Occupations

Compare the job duties, education, job growth, and pay of computer systems analysts with similar occupations.

More Information, Including Links to O*NET

Learn more about computer systems analysts by visiting additional resources, including O*NET, a source on key characteristics of workers and occupations.

What Computer Systems Analysts Do



Analysts create diagrams to help programmers and architects build computer systems.

Computer systems analysts, sometimes called *systems architects*, study an organization's current computer systems and procedures and design improvements to them. In doing so, these analysts help the organization operate more efficiently.

Duties

Computer systems analysts typically do the following:

- Consult with managers to determine the role of information technology (IT) systems in an organization
- Research different technologies to decide if they would increase the organization's efficiency
- Analyze costs and benefits of IT systems and upgrades to help managers decide which, if any, to install
- Devise ways to add functionality to existing computer systems
- Design new systems by configuring hardware and software
- Oversee the installation and configuration of new systems and customize them for the organization
- Test systems to ensure that they work as expected
- Write instruction manuals and train the systems' end users

Most computer systems analysts specialize in computer systems that are specific to their organization type. For example, an analyst might work with financial computer systems or with engineering computer systems. Computer systems analysts work with other IT team members to help an organization's business leaders understand how computer systems best serve the organization.

Computer systems analysts use a variety of techniques, such as data modeling, to design computer systems. Data modeling allows analysts to view processes and data flows. Analysts conduct indepth tests and analyze information and trends in the data to increase a system's efficiency.

Analysts calculate requirements for how much memory, storage, and computing power the computer system needs. They prepare diagrams for programmers or engineers to use when building the system. Analysts also work with these people to solve problems that arise after the initial system setup. Most analysts do some programming in the course of their work.

Analysts who focus on coding and debugging, in addition to their other tasks, may be referred to as *programmer analysts.* They also may design and update their system's software and create applications tailored to their organization's needs. For information about other occupations that do programming or testing, see the profiles on computer programmers and software developers, quality assurance analysts, and testers.

In some cases, analysts who supervise the installation or upgrade of IT systems from start to finish may be called *IT project managers*. They monitor a project's progress to ensure that deadlines, standards, and cost targets are met. IT project managers who also plan and direct an organization's IT department or IT policies are included in the profile on computer and information systems managers.

<- Summary

Work Environment ->

Work Environment



Some systems analysts work as consultants.

Computer systems analysts held about 521,100 jobs in 2024. The largest employers of computer systems analysts were as follows:

Computer systems design and related services	23%
Finance and insurance	14
Management of companies and enterprises	11
Government, excluding state and local education and hospitals	8
Information	7

Computer systems analysts may work directly for an organization or as contractors, often for an information technology firm. The projects that computer systems analysts work on usually require them to collaborate with others.

Work Schedules

Most computer systems analysts work full time.

<- What They Do

How to Become One ->

How to Become a Computer Systems Analyst



Most computer systems analysts have a bachelor's degree.

Computer systems analysts typically need a bachelor's degree to enter the occupation. Studying a computer science or information systems field is common, although not always a requirement. Some firms hire job candidates who have a degree in business or liberal arts along with relevant skills.

Education

Computer systems analysts typically need a bachelor's degree in computer and information technology or a related field, such as mathematics. Because these analysts are involved in the business side of an organization, taking business courses or majoring in management information systems may be helpful. Some employers hire job candidates who have liberal arts degrees and have gained programming or technical expertise elsewhere.

Some employers prefer applicants who have a master's degree in business administration (MBA) with a concentration in information systems. For technically complex jobs, a master's degree in computer science may be more appropriate.

Systems analysts may take continuing education courses throughout their careers to stay abreast of new technology. Technological advances are common in the computer field, and continual study is necessary to remain competitive.

Systems analysts also must understand the industry they are working in. For example, an analyst working in a hospital may need a thorough understanding of healthcare plans and programs such as Medicare and Medicaid, and an analyst working for a bank may need to understand finance. Having industry-specific knowledge helps systems analysts communicate with managers to determine the role of the information technology (IT) systems in an organization.

Advancement

With experience, systems analysts may advance to become project managers and lead a team of analysts. Some eventually become IT directors or chief technology officers. For more information, see the profile on computer and information systems managers.

Important Qualities

The following are examples of qualities that are important for these workers to perform their duties. For more information, visit the Employment Projections (EP) skills data page.

Analytical skills. Analysts must interpret complex information from various sources and decide the best way to move forward on a project. They must also figure out how changes may affect the project.

Business skills. Analysts design and implement computer systems or upgrade existing systems to meet an organization's business goals. Analysts must have a thorough understanding of their organization's business objectives in order to meet its needs.

Communication skills. Analysts work as a liaison between management and the IT department and must explain complex issues in a way that both understand.

Creativity. Because analysts are tasked with finding innovative solutions to computer problems, they must be resourceful and use ingenuity in their work.

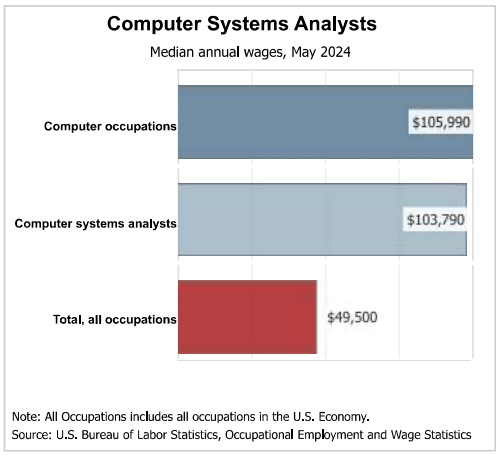
Detail oriented. Analysts study an organization's computer systems and must pay attention to the minutiae to find areas of inefficiency or error.

Organizational skills. Analysts may coordinate work with different areas of an organization and must keep track of many tasks and deadlines to ensure that projects proceed according to plan.

<- Work Environment

Pay ->

Pay



The median annual wage for computer systems analysts was $103,790 in May 2024. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than $63,160, and the highest 10 percent earned more than $166,030.

In May 2024, the median annual wages for computer systems analysts in the top industries in which they worked were as follows:

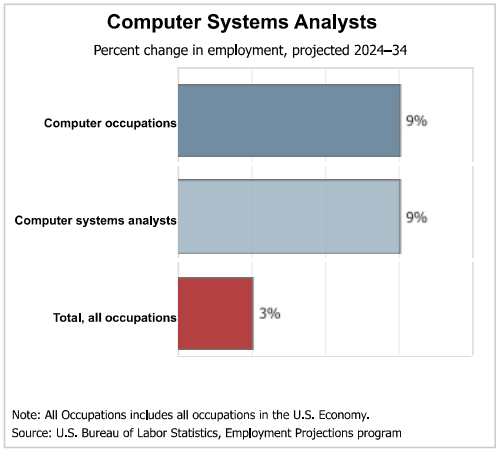
Management of companies and enterprises	$109,210
Information	107,630
Finance and insurance	104,910
Computer systems design and related services	104,370
Government, excluding state and local education and hospitals	97,430

Most computer systems analysts work full time.

<- How to Become One

Job Outlook ->

Job Outlook



Employment of computer systems analysts is projected to grow 9 percent from 2024 to 2034, much faster than the average for all occupations.

About 34,200 openings for computer systems analysts are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire.

Employment

As organizations across the economy continue to rely on and expand information technology (IT), including artificial intelligence (AI), computer systems analysts will be hired to design and install new computer systems. Small firms with minimal IT requirements may find it more cost effective to contract with outside firms for these services rather than to hire computer systems analysts directly.

Employment projections data for computer systems analysts, 2024–34

Computer systems analysts

SOC Code:
15-1211

Employment, 2024:
521,100

Projected Employment, 2034:
566,500

Change, 2024–34 (Percent):
9

Change, 2024–34 (Numeric):
45,500

Employment By Industry:
Get data

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

<- Pay

State & Area Data ->

State & Area Data

Occupational Employment and Wage Statistics (OEWS)

The Occupational Employment and Wage Statistics (OEWS) program produces employment and wage estimates annually for over 800 occupations. These estimates are available for the nation as a whole, for individual states, and for metropolitan and nonmetropolitan areas. The link below goes to OEWS data maps for employment and wages by state and area. Use the dropdown boxes to select an occupation.

Occupational Employment and Wage Statistics (OEWS) Profiles

Projections Central

Occupational employment projections are developed for all states by Labor Market Information (LMI) or individual state Employment Projections offices. All state projections data are available at www.projectionscentral.org. Information on this site allows projected employment growth for an occupation to be compared among states or to be compared within one state. In addition, states may produce projections for areas; there are links to each state's websites where these data may be retrieved.

CareerOneStop

CareerOneStop includes hundreds of occupational profiles with data available by state and metro area. There are links in the left-hand side menu to compare occupational employment by state and occupational wages by local area or metro area. There is also a salary info tool to search for wages by zip code.

<- Job Outlook

Similar Occupations ->

Similar Occupations

This table shows a list of occupations with job duties that are similar to those of computer systems analysts.

Actuaries

Job Duties:
Actuaries use mathematics, statistics, and financial theory to analyze the economic costs of risk and uncertainty.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$125,770

Computer and Information Research Scientists

Job Duties:
Computer and information research scientists design innovative uses for new and existing computing technology.

Entry-Level Education:
Master's degree

2024 Median Pay:
$140,910

Computer and Information Systems Managers

Job Duties:
Computer and information systems managers plan, coordinate, and direct computer-related activities in an organization.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$171,200

Computer Network Architects

Job Duties:
Computer network architects design and implement data communication networks, including local area networks (LANs), wide area networks (WANs), and intranets.

Entry-Level Education:

Bachelor's degree

2024 Median Pay:
$130,390

Computer Programmers

Job Duties:
Computer programmers write, modify, and test code and scripts that allow computer software and applications to function properly.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$98,670

Computer Support Specialists

Job Duties:
Computer support specialists maintain computer networks and provide technical help to computer users.

Entry-Level Education:
See How to Become One

2024 Median Pay:
$61,550

Database Administrators and Architects

Job Duties:
Database administrators and architects create or organize systems to store and secure data.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$123,100

Information Security Analysts

Job Duties:
Information security analysts plan and carry out security measures to protect an organization's computer networks and systems.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$124,910

Management Analysts

Job Duties:
Management analysts recommend ways to improve an organization's efficiency.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$101,190

Network and Computer Systems Administrators

Job Duties:
Network and computer systems administrators install, configure, and maintain organizations' computer networks and systems.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$96,800

Operations Research Analysts

Job Duties:
Operations research analysts use mathematics and logic to help solve complex issues.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$91,290

Software Developers, Quality Assurance Analysts, and Testers

Job Duties:
Software developers design computer applications or programs. Software quality assurance analysts and testers identify problems with applications or programs and report defects.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$131,450

Web Developers and Digital Designers

Job Duties:
Web developers create and maintain websites. Digital designers develop, create, and test website or interface layout, functions, and navigation for usability.

Entry-Level Education:
Bachelor's degree

2024 Median Pay:
$95,380

Contacts for More Information

O*NET

Computer Systems Analysts

Health Informatics Specialists

<- Similar Occupations

SUGGESTED CITATION:

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Computer Systems Analysts, at https://www.bls.gov/ooh/computer-and-information-technology/computer-systems-analysts.htm (visited *June 23, 2026*).

Last modified date: August 28, 2025

U.S. BUREAU OF LABOR STATISTICS Occupational Outlook Handbook Office of Employment and Unemployment Statistics Suitland Federal Center Floor 3 4600 Silver Hill Road Washington, DC 20212-0002

Telephone: 202-691-5700_ www.bls.gov/ooh Contact OOH

O*NET OnLine

General and Operations Managers

11-1021.00

Bright Outlook | Updated 2026

Plan, direct, or coordinate the operations of public or private sector organizations, overseeing multiple departments or locations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services. Usually manage through subordinate supervisors. Excludes First-Line Supervisors.

Sample of reported job titles: Business Manager, Center Manager, Department Manager, District Manager, General Manager (GM), Operations Director, Operations General Manager (Operations GM), Operations Manager, Plant Superintendent, Store Manager

Summary | Details | Custom | Easy Read | Veterans | Español

Contents

Occupation-Specific Information

Tasks

5 of 17 displayed

- Review financial statements, sales or activity reports, or other performance data to measure productivity or goal achievement or to identify areas needing cost reduction or program improvement.
- Direct and coordinate activities of businesses or departments concerned with the production, pricing, sales, or distribution of products.
- Direct administrative activities directly related to making products or providing services.
- Prepare staff work schedules and assign specific duties.
- Direct or coordinate financial or budget activities to fund operations, maximize investments, or increase efficiency.

Occupational Requirements

Work Activities

5 of 32 displayed

- **Working with Computers —** Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- **Getting Information —** Observing, receiving, and otherwise obtaining information from all relevant sources.
- **Communicating with Supervisors, Peers, or Subordinates —** Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- **Making Decisions and Solving Problems —** Analyzing information and evaluating results to choose the best solution and solve problems.
- **Establishing and Maintaining Interpersonal Relationships —** Developing constructive and cooperative working relationships with others, and maintaining them over time.

Detailed Work Activities

5 of 20 displayed

- Analyze data to inform operational decisions or activities.
- Analyze financial records to improve efficiency.
- Direct organizational operations, projects, or services.
- Direct sales, marketing, or customer service activities.
- Prepare staff schedules or work assignments.

Work Context

5 of 26 displayed

- **Frequency of Decision Making —** 93% responded “Every day.”
- **E-Mail** — 88% responded “Every day.”
- **Face-to-Face Discussions with Individuals and Within Teams —** 86% responded “Every day.”
- **Freedom to Make Decisions —** 86% responded “A lot of freedom.”
- **Telephone Conversations —** 88% responded “Every day.”

Experience Requirements

Job Zone

Title	Job Zone Four: Considerable Preparation Needed
Education	Most of these occupations require a four-year bachelor's degree, but some do not.
Related Experience	A considerable amount of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.
Job Training	Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.

Job Zone Examples Many of these occupations involve coordinating, supervising, managing, or training others. Examples include real estate brokers, sales managers, database administrators, graphic designers, conservation scientists, art directors, and cost estimators.

SVP Range (7.0 to < 8.0)

Training & Credentials

State training Select a State Go

Local training ZIP Code Go

Certifications Find certifications nationwide

State licenses Select a State Go

Apprenticeship Opportunities

All 2 displayed

Example apprenticeship titles for this occupation:

- Operations Management
- Professional Golf & Operations Manager

Specific title(s) listed above are vetted by industry and approved by the U.S. Department of Labor for use in a Registered Apprenticeship Program.

Start your career and build your skillset. Visit **Apprenticeship.gov** to learn about opportunities related to this occupation.

Worker Requirements

Software Skills

5 of 53 displayed

- **Business intelligence and data analysis software** — IBM Cognos Impromptu; Oracle Business Intelligence Enterprise Edition; Qlik Tech QlikView; Tableau
- **Customer relationship management CRM software —** Act!; Oracle Eloqua; Salesforce software ; Sugar CRM
- **Data base user interface and query software —** Airtable; Amazon Web Services AWS software ; Blackboard software; Yardi software

404

- **Enterprise resource planning ERP software —** Deacom ERP; Microsoft Dynamics; Oracle PeopleSoft 🔥; SAP software 🔥
- **Operating system software —** Apple macOS 🔥; Microsoft Windows 🔥; Oracle Solaris; Shell script 🔥

Hot Technologies are requirements most frequently included across all employer job postings.
See all 49 Hot Technologies for this occupation.

In Demand skills are frequently included in employer job postings for this occupation.
See all 3 In Demand skills for this occupation.

Essential Skills

5 of 8 displayed

- **Active Listening —** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Monitoring —** Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
- **Reading Comprehension —** Understanding written sentences and paragraphs in work-related documents.
- **Speaking —** Talking to others to convey information effectively.
- **Critical Thinking —** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.

Transferable Skills

5 of 14 displayed

- **Coordination —** Adjusting actions in relation to others' actions.
- **Management of Personnel Resources —** Motivating, developing, and directing people as they work, identifying the best people for the job.
- **Social Perceptiveness —** Being aware of others' reactions and understanding why they react as they do.
- **Complex Problem Solving —** Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
- **Judgment and Decision Making —** Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Knowledge

5 of 9 displayed

- **Administration and Management —** Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

- **Customer and Personal Service —** Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
- **English Language —** Knowledge of the structure and content of the English language including the meaning and spelling of words, and rules of composition and grammar.
- **Production and Processing —** Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
- **Mathematics —** Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

Education

How much education does a new hire need to perform a job in this occupation? Respondents said:

29%	High school diploma or equivalent required
27%	Bachelor's degree required
22%	Some college, no degree required

Worker Characteristics

Abilities

5 of 14 displayed

- **Oral Comprehension —** The ability to listen to and understand information and ideas presented through spoken words and sentences.
- **Oral Expression —** The ability to communicate information and ideas in speaking so others will understand.
- **Written Comprehension —** The ability to read and understand information and ideas presented in writing.
- **Written Expression —** The ability to communicate information and ideas in writing so others will understand.
- **Deductive Reasoning —** The ability to apply general rules to specific problems to produce answers that make sense.

Interests

All 2 displayed

Interest code: **EC**

Want to discover your interests? Take the **O*NET Interest Profiler**.

- **Enterprising —** Work involves managing, negotiating, marketing, or selling, typically in a business setting, or leading or advising people in political and legal situations. Enterprising occupations are

often associated with business initiatives, sales, marketing/advertising, finance, management/administration, professional advising, public speaking, politics, or law.

- **Management/Administration** — Work involves planning, directing, or coordinating the daily operations of an organization, and overseeing personnel, business, or administrative services.
- **Business Initiatives** — Work involves creating strategic plans or taking actions to expand an organization's business or market share.

- **Conventional** — Work involves following procedures and regulations to organize information or data, typically in a business setting. Conventional occupations are often associated with office work, accounting, mathematics/statistics, information technology, finance, or human resources.
  - **Human Resources** — Work involves recruiting, selecting, and training job applicants, maintaining employee personnel records, administering compensation and employee-benefit programs, and conducting employee performance reviews.

Work Styles

5 of 9 displayed

- **Initiative** — A tendency to be proactive and take on extra responsibilities and tasks that may fall outside of one's required work role.
- **Self-Confidence** — A tendency to believe in one's work-related capabilities and ability to control one's work-related outcomes.
- **Leadership Orientation** — A tendency to lead, take charge, offer opinions, and provide direction at work.
- **Perseverance** — A tendency to exhibit determination and resolve to perform or complete tasks in the face of difficult circumstances or obstacles at work.
- **Adaptability** — A tendency to be open to and comfortable with change, new experiences, or ideas at work.

Workforce Characteristics

Wages & Employment Trends

Median wages (2025)	$50.85 hourly, $105,770 annual
State wages	Select a State Go
Local wages	ZIP Code Go
Employment (2024)	3,712,900 employees
Projected growth (2024-2034)	Average (3% to 4%)
Projected job openings (2024-2034)	308,700

State trends	Select a State Go
Top industries (2024)	Professional, Scientific, and Technical Services Retail Trade

Source: Bureau of Labor Statistics 2025 wage data and 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2024-2034). "Projected job openings" represent openings due to growth and replacement.

Job Openings on the Web

State job openings	Select a State Go
Local job openings	ZIP Code Go

More Information

Related Occupations

5 of 10 displayed

- 11-3012.00 Administrative Services Managers Bright Outlook
- 11-1011.00 Chief Executives
- 11-3013.00 Facilities Managers
- 41-1012.00 First-Line Supervisors of Non-Retail Sales Workers
- 11-3051.00 Industrial Production Managers

Professional Associations

Disclaimer: Sources are listed to provide additional information on related jobs, specialties, and/or industries. Links to non-DOL Internet sites are provided for your convenience and do not constitute an endorsement.

National Associations

5 of 14 displayed

- American Ceramic Society
- American Institute of Architects
- American Institute of Chemical Engineers
- American Public Works Association
- American Society of Civil Engineers

Accreditation, Certification, & Unions

- American Concrete Institute
- American Management Association
- Financial Executives International
- Institute of Certified Professional Managers

Innovation Commitment for SAP S/4HANA until 2040

Clarity and Choice on SAP Business Suite 7

On February 4, 2020, SAP has announced an innovation commitment for SAP S/4HANA until the end of 2040. This means that until 2040, there will always be at least one release of SAP S/4HANA in maintenance.

At the same time, SAP will provide mainstream maintenance for SAP Business Suite 7 core applications until end of 2027. This offboarding phase will be followed by optional extended maintenance until end of 2030.

SAP will provide mainstream maintenance until end of 2027 for SAP Business Suite 7 core applications, which are also core applications of SAP Business All-in-One, including the latest three enhancement packages of:

- SAP ERP 6.0
- SAP Customer Relationship Management 7.0
- SAP Supply Chain Management 7.0
- SAP Supplier Relationship Management 7.0 applications
- SAP Business Suite powered by SAP HANA

Following mainstream maintenance, SAP will offer customers choice on maintenance for SAP Business Suite 7 core applications from 2028 onwards:

- Customer needing support for their Business Suite 7 core applications in longer conversion phases to SAP S/4HANA can choose the extended maintenance offering. This comes with a premium of two percent points on the maintenance basis for all support offerings for the scope of SAP Business Suite 7. It will be available for three years from beginning of 2028 until end of 2030.
- Customers who do not opt for the extended maintenance, or where extended maintenance has ended, will receive customer specific maintenance for their SAP Business Suite 7 applications.

Additional context can be found in the related press release as well as in the SAP News interview with Michael Kleinemeier, former member of the Executive Board, and Thomas Saueressig member of the Executive Board, SAP Product Engineering, about the long-term maintenance commitments for SAP S/4HANA and SAP Business Suite 7.

For more information on SAP's release and maintenance strategy:

SAP Note 2881788: End of SAP Business Suite 7 mainstream maintenance (log-in required)

SAP Note 1648480: Maintenance for SAP Business Suite 7 software including SAP NetWeaver (log-in required)

SAP Note 52505: Support after end of mainstream maintenance or extended maintenance (log-in required)

SAP Release Strategy (log-in required)

Product Availability Matrix (log-in required)

- Preferências de Cookies

Advanced Manufacturing



"Made in Texas" is a powerful global brand.

A magnet for manufacturing, Texas is where today's products are made and where tomorrow's technologies are brought to life. In fact, Texas is the #1 exporting state in the nation, now for 24 consecutive years, and the top exporting state for 92 countries across the world.

> ***Texas Advantages:*** Texas offers unmatched operating advantages for advanced manufacturers: a business-friendly climate—with no corporate or personal income tax—along with a predictable regulatory environment, a highly skilled and growing workforce, a central geographic location in North America, robust infrastructure providing direct access to domestic and international markets and an export-oriented production environment. And with lower energy and land costs, faster permitting and fewer land-use restrictions, Texas offers advanced manufacturers room to grow.

In This Section

Industries

Advanced Manufacturing
Food Production
Biotech & Life Sciences
Corporate Services
Tourism & Culture
Energy Evolution
Information Technology & AI
Petroleum Refining & Chemicals
Rare Earth & Mineral Mining
Transportation & Logistics
Semiconductors

Target industry clusters within the Advanced Manufacturing sector include:

- Aerospace Vehicles, Aircraft and Defense
- Automotive
- Computers, Electronics and Semiconductors
- Production Technology and Heavy Machinery

Aerospace Vehicles, Aircraft and Defense

An epicenter for the global aerospace and aviation industry, Texas is home to the headquarters of two international airlines, major operations for leading commercial space firms, 15 active military installations and the Army Futures Command headquarters as well as NASA's Johnson Space Center. The broad range of aerospace activities in Texas includes fighter jet manufacturing, helicopter assembly, navigation instrument development, advanced space-flight research, military flight training and commercial space travel.

> ***Building on a legacy of space leadership,*** Texas now stands at the helm of the next generations of human exploration and is creating the model for the modern space economy. The new Texas Space Commission, through the Space Exploration & Aeronautics Research Fund (SEARF), provides grants to promote innovation in space operations and commercial aerospace.

Automotive

Texas is home to more than 730 automotive manufacturing facilities. Industry leaders investing in Texas include global Fortune 500 brand leaders General Motors, Tesla, Toyota and more. These automakers are supported by a robust supplier ecosystem that creates a reliable supply chain network with significant logistical and cost benefits. As a result of these investments, Texas has experienced a 48% increase in automotive manufacturing output over the last 10 years, and Texas ranks #2 in the U.S. for automotive exports, including motor vehicles, bodies, parts and trailers.

Computers, Electronics and Semiconductors

Latest Video



2025 Manufacturing Week in Texas

Texas is the birthplace of the integrated circuit and where the future of the semiconductor industry is building. Ranked #1 in the U.S. for semiconductor manufacturing capacity, Texas is the #1 exporter of semiconductors and other electronic components for 14 consecutive years.

> ***Texas is leading America's resurgence in semiconductor manufacturing.*** The Texas CHIPS Act, signed into law in 2023, established the Texas CHIPS Office, the Texas Semiconductor Innovation Consortium (TSIC) and the Texas Semiconductor Innovation Fund (TSIF) to leverage Texas' investments in the semiconductor industry, encourage semiconductor-related companies to expand in the state, further develop the expertise and capacity of Texas institutions of higher education and maintain the state's position as the nation's leader in semiconductor manufacturing.

Production Technology and Heavy Machinery

Critical to the state, national and global economies, industries in this cluster include heavy equipment manufacturing, such as farm machinery, mining machinery and other industrial and construction machinery as well as upstream activities such as ball and roller bearing manufacturing, valve and fitting manufacturing and fabricated metal manufacturing. The state's robust infrastructure and large and growing workforce make Texas an ideal location for production technology and heavy machinery businesses to locate, driving steady employment and GDP growth in the cluster.

Top Companies

Advanced manufacturing companies with a strong presence in Texas:

Dell Technologies	Samsung
Texas Instruments	Toyota
General Motors Co.	Lockheed Martin
Caterpillar	Tesla

Textron NXP Semiconductor

Resources:

- **Sector Profile: Advanced Manufacturing**
- **Snapshot: Manufacturing (2023)**
- **Snapshot: Automotive Manufacturing (2025)**
- **Snapshot: Aerospace, Aviation & Defense (2025)**
- **Report: Aerospace, Aviation & Defense Industry (2025)**

Texas Economic Development & Tourism Office
P.O. Box 12428
Austin, Texas 78711
(512) 936-0100

© 2026, State of Texas, Office of the Governor, Texas Economic Development Office

Exhibit C.II – Second Prong – Well Positioned to Advance the Proposed Endeavor

Please refer to all documents contained in Exhibit B

Exhibit C.II – Second Prong – Professional Licenses and Certifications

Proof of professional affiliation issued by

CRA-SP

(Regional Council of Administration of São Paulo)

Registration
158485

Registration Date
10/09/2025

Issue
1st

Name
LUCIANO APARECIDO DE SOUZA

License
ADMINISTRATOR

Identification Document
01218815034

Document / Issuing Authority
DETRAN/SP

CPF
286.551.298-36

Mother's Name
MARINEIDE ALVES DE SOUZA

Date of Birth
08/15/1979

Nationality
BRAZILIAN

Place of Birth
SÃO BERNARDO DO CAMPO

Place of Issuance
SÃO PAULO - SÃO PAULO

Date of Issuance
11/07/2025





Document issued on 11/07/2025 4:20 PM
Subject to modifications by the issuer

CHECK THE AUTHENTICITY OF THE QR CODE USING VIO APP

Should you need to verify the status of this document, please contact the issuing authority directly.

We suggest requesting the issuance of this document with the same date as its verification day.

SERPRO (*Federal Data Processing Service*) is not liable for any changes to the status of the issued document due to future internal requirements of the issuing authority.

Contact the issuing authority for validation
(11) 3087-3200
atendimento@crasp.gov.br

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.

Comprovante de vinculo funcional emitido por
CRA-SP

Registro
158485

Data de Registro
09/10/2025

Via
1ª

Nome
LUCIANO APARECIDO DE SOUZA

Habilitação
ADMINISTRADOR

Doc. Identificação
01218815034

Documento / Órgão Expedidor
DETRAN/SP

CPF
286.551.298-36

Nome da Mãe
MARINEIDE ALVES DE SOUZA

Data de Nascimento
15/08/1979

Nacionalidade
BRASILEIRA

Naturalidade
SÃO BERNARDO DO CAMPO

Local de Expedição
SÃO PAULO - SP

Data de Expedição
07/11/2025





Comprovante emitido em 07/11/2025 16:20
Sujeito a modificações pelo emissor

CHECK THE AUTHENTICITY OF THE QR CODE USING VIO APP

Caso precise verificar o status desse documento, entre em contato diretamente com o orgão emissor.

Sugerimos solicitar a emissão desse documento com a mesma data do dia de sua verificação.

O SERPRO não se responsabiliza por eventuais alterações de status do documento emitido em virtude de futuras necessidades internas do órgão emissor.

Contate o órgão emissor para validação
(11) 3087-3200
atendimento@crasp.gov.br



CERTIFICATE

We hereby confirm that

Luciano Aparecido Souza

is certified as

Solution Consultant
SCM - Procurement with mySAP ERP 2005

Softwarecomponents: SAP Enterprise Central Component (ECC) 6.0

Certificate ID: 0004453601
Certified on: Agosto 04, 2007

Walldorf, Agosto 10, 2007

B.-M. R

Dr. Bernd-Michael Rumpf
Global Head of Field Services

THE BEST-RUN BUSINESSES RUN SAP™

Scanned with CamScanner

Exhibit C.II - Second Prong: Courses and Additional Professional Qualifications



CERTIFICATE

This is to certify that Mr.
Luciano Aparecido de Souza
completed the course
SCM610 Delivery Processes
held on 05/08/2006,
with a total duration of 3 days.

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner



CERTIFICATE

This is to certify that Mr.
Luciano Aparecido de Souza
completed the course
SCM630 Warehouse Management
held on 06/12/2006,
with a total duration of 4 days.

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner



CERTIFICATE

This is to certify that Mr.

Luciano Aparecido de Souza

completed the course

SCM631 Additional Topics in Warehouse Management

held on 06/19/2006

with a total duration of 2 days.

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner



Diploma

We hereby express

our appreciation to Consultant Mr.

Luciano Souza

for his outstanding commitment demonstrated during the

implementation of the new SAP system in the Andean Region.

SAP

SEE THE WORLD IN A NEW LIGHT

OSRAM

Scanned with CamScanner



CERTIFICATE

This is to certify that Mr.

Luciano Aparecido de Souza

completed the course

SCM601 Processes in Logistics Execution

held on 03/06/2006

with a total duration of 3 days.

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese and Spanish to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

Date: July 8, 2026



CERTIFICATE

Certificamos que o Sr.

Luciano Aparecido de Souza

concluiu com sucesso o curso

SCM610 Delivery Processes

realizado em 08/05/2006

com duração de 3 dias

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

SAP

Scanned with CamScanner



CERTIFICATE

Certificamos que o Sr.

Luciano Aparecido de Souza

concluiu com sucesso o curso

SCM630 Warehouse Management

realizado em 12/06/2006

com duração de 4 dias

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner



CERTIFICATE

Certificamos que o Sr.

Luciano Aparecido de Souza

concluiu com sucesso o curso

SCM631 Additional Topics in Warehouse Management

realizado em 19/06/2006

com duração de 2 dias

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner



Diploma

Por medio del presente,

agradecemos al Consultor Sr. (a)

Luciano Souza

por su alto compromiso demostrado en la implementación

del nuevo sistema SAP en la Región Andina.

SAP
VEA EL MUNDO EN UNA NUEVA LUZ OSRAM

Scanned with CamScanner



CERTIFICATE

Certificamos que o Sr.

Luciano Aparecido de Souza

concluiu com sucesso o curso

SCM601 Processes in Logistics Execution

realizado em 06/03/2006

com duração de 3 dias

SAP Brasil Ltda.

THE BEST-RUN BUSINESSES RUN SAP

Scanned with CamScanner

CERTIFICATE

A2.02.03.006

LUCIANO APARECIDO DE SOUZA

Participated in the course

INTERNATIONAL AND UNITIZED TRANSPORTATION OF CARGO

offered by
SEMINARIOS ADUANEIRAS S/C LTDA.

Held from
AUGUST 19 TO 21 AND 23, 2002 - TOTAL WORKLOAD: 12 hours

Place
SÃO PAULO

Having satisfied the attendance requirements established by our regulations.

Carlos Sérgio Serra
CEO

ADUANEIRAS
INFORMAÇÃO SEM FRONTEIRAS
www.aduaneiras.com

Scanned with CamScanner

CERTIFICATE

A6.02.02.016

LUCIANO APARECIDO DE SOUZA

Representing Company

BRADESCO BANK S/A

Participated in the course

FOREIGN EXCHANGE AND INTERNATIONAL BANKING OPERATIONS IN FOREIGN TRADE

offered by

SEMINARIOS ADUANEIRAS S/C LTDA.

Held from

AUGUST 12 TO 16, 2002 - TOTAL WORKLOAD: 15 hours

Place

SÃO PAULO

Having satisfied the attendance requirements established by our regulations.

Carlos Sérgio Serra
CEO

ADUANEIRAS
INFORMAÇÃO SEM FRONTEIRAS
www.aduaneiras.com

Scanned with CamScanner

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese and Spanish to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

Date: July 8, 2026

CERTIFICADO

A2.02.03.006

LUCIANO APARECIDO DE SOUZA

Participou do Curso

TRANSPORTES INTERNACIONAIS E UNITIZAÇAO DE CARGAS

Realizado por

SEMINARIOS ADUANEIRAS S/C LTDA.

Data

19 A 21 E 23 DE AGOSTO de 2002 - CARGA HORARIA : 12

SÃO PAULO

Tendo obtido a frequencia exigida pelo nosso regimento.

Carlos Sérgio Serra
Diretor-Presidente

ADUANEIRAS
INFORMAÇÃO SEM FRONTEIRAS
www.aduaneiras.com

Scanned with CamScanner

CERTIFICADO

A6.02.02.016

LUCIANO APARECIDO DE SOUZA

Representando a Empresa

BANCO BRADESCO S/A

Participou do Curso

CAMBIO E OPERACOES BANCARIAS INTER. NO COM. EXTERIOR

Realizado por

SEMINARIOS ADUANEIRAS S/C LTDA.

Data

12 A 16 DE AGOSTO de 2002 - CARGA HORARIA : 15

Tendo obtido a frequencia exigida pelo nosso regimento.

Carlos Sérgio Serra
Diretor-Presidente

ADUANEIRAS
INFORMAÇÃO SEM FRONTEIRAS
www.aduaneiras.com

Scanned with CamScanner

Exhibit C.II - Second Prong: Evidence of Professional Recognition


18ª CONFERÊNCIA ANUAL 2015
TI SIMPLIFICANDO NEGÓCIOS E PROCESSOS
ASUG



CPFL ACHIEVES IMPACT AWARDS

TAURON PROGRAM DRIVES COMPANY TO WIN TOP AWARD WITH CASE IMPLEMENTATION

As tradition dictates, the grand winner of the 2015 Impact Awards was announced at the closing of the 18th ASUG Brasil Annual Conference: CPFL Energia. This long-standing award from the ASUG Brasil community aims to highlight the most successful case studies within the association, while also providing project teams with the opportunity to share their experiences. Entitled "Case: Smartgrid - SAP CCS - Tauron Program - Telemetering," the project was developed alongside the implementation partner, Neoris.

CPFL Energia's case representative, Guilherme Tavares Bodaneze, IT Project Specialist at the company, was deeply moved by the victory. "I was thrilled that we won, especially since it involves a technology in an area that is still so new and enables integration with SAP's ERP," he celebrated.

Bodaneze made a point of recognizing everyone who contributed to this achievement, thanking the more than 50 collaborators, both direct and indirect, who are linked to the project. "It is important to remember that this efficient project is the result of everyone's effort, including our consultancy, and I want to deeply thank all the participants."

Neoris' SAP Solution Architect Specialist (Energy & Utilities), Pedro Nunes, was also pleased with the Impact Awards results. "The project brought countless benefits, such as reducing electricity consumption and streamlining the transfer of meter readings integrated with SAP," he explained.

Second place in the awards went to the beauty company Beauty'in, with the "Case: Regaining Enterprise Control," developed by partner E-IT Technologies. The footwear and accessories company Arezzo took third place with the "Case: Supply Chain Management in the Fashion Sector with AFS and EWM for Fashion," executed alongside FH Consultoria.

DECISIVE CRITERIA FOR CASE SELECTION:

- ***definition of best practices,***
- ***service level improvements,***
- ***originality;***
- ***innovation.***

The first-place winner received a trip to Porto de Galinhas, in Pernambuco; the second-place winner, a trip to Foz do Iguaçu, in Paraná; and the third-place winner was awarded an Apple iPad.

Scanned with CamScanner

INSIDE THE WINNING CASE

The Tauron program is one of the SAP solutions utilized by CPFL Energia within its technological infrastructure. It operates across three distinct fronts — mobility, operations, and telemetering — and aims to improve operational efficiency and reduce commercial losses, driving gains for shareholders and benefits for consumers. The featured case pertains to the telemetering front, which implemented one of these SmartGrid initiatives. The deployment utilized SAP IS-U/CCS, enabling data read by smart meters, distributed across CPFL Energia's eight utility companies, to be automatically billed at CPFL's data center in Campinas (São Paulo) with a high level of automation and reliability.

The project enabled the reduction of losses and costs in commercial processes, achieving the following objectives defined and financially quantified in the business case:

- Implement a remote reading and meter data management solution across the CPFL Group;



PHOTOS: EDUARDO DE SOUZA / DOUGLAS LUCENNA

- integration with billing systems;
- automation of the billing process;
- continuous monitoring of customers;
- establish a Metering Center.



BEAUTY'IN CASE

With the help of its new implementation partner (E-IT Technologies), the beauty company successfully aligned with SAP ERP and overhauled its infrastructure. In this new phase, it eliminated instability by choosing the SAP ECC system, version 6.0. Furthermore, this case was submitted to the awards as a warning to new companies against potential pitfalls in SAP technology deployment. Consequently, the company updated all environments (Development, Quality Assurance, and Production), streamlined various processes, and redesigned its transport strategy between environments.

Among the achieved benefits are the safeguarding of the production environment against direct configuration changes; the creation of a detailed inventory assessment and stock adjustment; and the overhaul of logistics processes. These processes were reviewed, users were trained, and information was automatically integrated between Beauty'in and the logistics operator. In addition to these actions, the pricing policy was revised, new price lists and pricing determination strategies were created, and, to top it off, strict budget control was established.

AREZZO CASE

This was the first implementation of this solution combining AFS and EWM in Latin America. Test and execution plans were developed, and the key differentiators of the solutions were established for the projects:

- Product Creation/Engineering – PP/AFS, with tracking of the Logistics Flow;
- Sourcing/Procurement (MM/MRP AFS/Inbound NF-e/Fiori);
- Sourcing/Procurement (EWM – Receiving/Interna movement); and,
- Shipping.

The primary objective achieved with the project was to consolidate SAP within the company and shift the culture of how projects are executed. The entire methodology utilized, promoted, and followed throughout the project demonstrated to the company how essential organization and monitoring are to ensuring an effective final outcome.

As a result, governance levels have reached a new milestone and continue to evolve through the visibility that SAP provides,

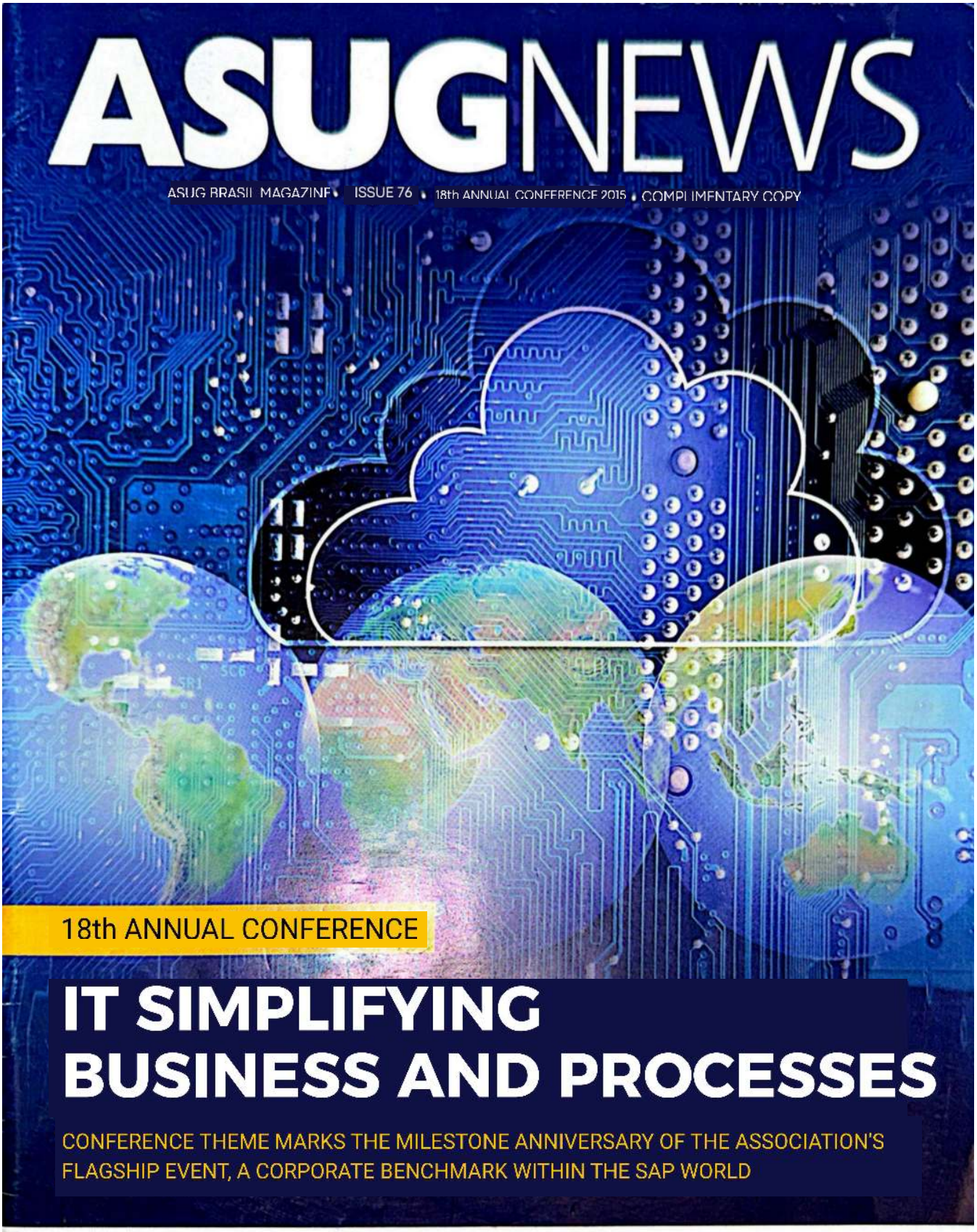


in addition to the adoption of market best practices across multiple areas. Another major objective achieved was completing the project within the designated timeframe, rigidly adhering to the schedule, and ensuring the quality of work reflected in an SPI above 0.95.

Scanned with CamScanner

ASUGNEWS

ASUG BRASIL MAGAZINE • ISSUE 76 • 18th ANNUAL CONFERENCE 2015 • COMPLIMENTARY COPY



18th ANNUAL CONFERENCE

IT SIMPLIFYING BUSINESS AND PROCESSES

CONFERENCE THEME MARKS THE MILESTONE ANNIVERSARY OF THE ASSOCIATION'S FLAGSHIP EVENT, A CORPORATE BENCHMARK WITHIN THE SAP WORLD

SIG BANKING MEETING
Implementation experiences are shared through networking, strategic topics, and success stories

IMPACT AWARDS 2015
CPFL Energia wins first place in the awards with the implementation of the Tauron Program

Scanned with CamScanner

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.


18ª CONFERÊNCIA ANUAL 2015
TI SIMPLIFICANDO NEGÓCIOS E PROCESSOS
ASUG



PROGRAMA TAURON FAZ EMPRESA LEVAR PRÊMIO MÁXIMO COM IMPLEMENTAÇÃO DE CASE

Como manda a tradição, no encerramento da 18ª Conferência da ASUG Brasil, foi anunciada a grande vencedora do Impact Awards 2015: a CPFL Energia. O prêmio é tradicional da comunidade ASUG Brasil e seu objetivo é destacar os cases de maior sucesso dentro da associação, além de dar oportunidade às equipes de projeto de compartilhar suas experiências. Intitulado "Case: Smartgrid – SAP CCS – Programa Tauron – Telemedição", o projeto foi desenvolvido com o parceiro implementador Neoris.

O representante do case da CPFL Energia, Guilherme Tavares Bodaneze, que é especialista em Projetos de TI na companhia, emocionou-se com a vitória. "Fiquei maravilhado por termos vencido, ainda mais por se tratar de um tipo de tecnologia de uma área ainda nova e que permite a integração com o ERP da SAP", festejou.

Bodaneze fez questão de lembrar de todos aqueles que contribuíram para essa conquista, agradecendo os mais de 50 colaboradores, diretos ou indiretos, que estão ligados ao projeto. "É importante lembrar que este projeto eficiente é o resultado de um esforço de todos, inclusive da nossa consultoria e quero agradecer demais todos os participantes."

O especialista em SAP Solution Architect (Energy & Utilities) da Neoris, Pedro Nunes, também estava satisfeito com o resultado do Impact Awards. "O projeto trouxe inúmeros benefícios, como a redução da utilização da energia elétrica e a transferência de leitura de medidores integrados com a SAP", explicou.

O segundo lugar do prêmio ficou com a empresa de beleza Beauty'in, com o "Case: Recuperando o Controle Empresarial" e desenvolvido pelo parceiro E-IT Technologies. A empresa do segmento de calçados e acessórios Arezzo levou o terceiro lugar com o "Case: Gestão da Cadeia de Suprimentos no Setor de Moda Com AFS e EWM for Fashion", executado com a FH Consultoria.

CRITÉRIOS DECISIVOS PARA A SELEÇÃO DOS CASES:

- *definição das melhores práticas,*
- *melhorias no nível de serviço,*
- *originalidade,*
- *inovação.*

O primeiro colocado recebeu uma viagem para Porto de Galinhas, em Pernambuco; o segundo, uma viagem a Foz do Iguaçu, no Paraná; e o terceiro foi premiado com um Ipad, da Apple.

Scanned with CamScanner

POR DENTRO DO CASE VENCEDOR

O programa Tauron é uma das soluções SAP que a CPFL Energia utiliza em seu parque tecnológico. Atua em três diferentes frentes – mobilidade, operação e telemedição – e tem a finalidade de melhorar a eficiência operacional e reduzir as perdas comerciais, com ganhos para os acionistas e benefícios para os consumidores. O case apresentado é relativo à frente de telemedição, que implementou uma destas iniciativas de SmartGrid. A implantação utilizou o SAP IS-U/CCS, possibilitando que os dados lidos pelos medidores inteligentes, espalhados nas oito distribuidoras da CPFL Energia, possam ser faturados automaticamente, no data center da CPFL, em Campinas (SP), com alto nível de automação e confiabilidade.

O projeto habilitou a redução das perdas e custos nos processos comerciais, atingindo os seguintes objetivos definidos e quantificados financeiramente no business case:

- implantar solução para teleleitura e gestão de dados de medição no Grupo CPFL;



FOTOS: EDUARDO DE SOUZA / DOUGLAS LUCENNA

- integração com sistemas de faturamentos;
- automatização do faturamento;
- monitoramento contínuo do cliente;
- implementar Centro de Medição.



CASE BEAUTY'IN

Com a ajuda da nova parceira empreendedora (E-IT Technologies), a empresa de beleza acabou por se acertar com o ERP da SAP e refez a parte de infraestrutura. Nesta nova fase, conseguiu acabar com a instabilidade, com a escolha do sistema SAP ECC versão 6.0. Além disso, este case foi enviado para a premiação como alerta às novas empresas contra possíveis erros na implementação da tecnologia SAP. Assim, atualizou todos os ambientes (Desenvolvimento, Testes e Produção), ajustando diversos processos, e refez a estratégia de transporte entre os ambientes.

Entre os benefícios conquistados estão a blindagem do ambiente de produção para alterações diretas de configurações; a criação de um levantamento detalhado do inventário e ajuste de estoques; a revisão dos processos logísticos. Foram revistos, treinaram usuários e integraram de forma automática as informações entre a Beauty´in e o operador logístico. Além destas ações, a política de preços foi revista, novas listas e estratégias de determinação de preços foram criadas e, para completar, um controle rigoroso de budget foi instituído.

CASE AREZZO

Foi a primeira implementação desta solução com AFS e EWM na América Latina. Fizeram planos de testes e execução e estabeleceram os diferenciais das soluções para os projetos:

- Criação/Engenharia de Produtos – PP/AFS, com acompanhamento do Fluxo Logístico;
- Sourcing/Compras (MM/MRP AFS/NFE Inbound/ Fiori);
- Sourcing/Compras (EWM – Recebimento/Movimentação interna); e,
- Expedição.

O principal objetivo atingido com o projeto foi consolidar o SAP na companhia e mudar a cultura de como realizar projetos. Toda a metodologia utilizada, divulgada e seguida no projeto mostrou à empresa como são essenciais a organização e o acompanhamento, para que o resultado final seja efetivo.

Com isso, os níveis de governança já estão em outro patamar e continuam em evolução pela visibilidade que o SAP proporciona,



além da adoção de melhores práticas de mercado para várias áreas. Outro objetivo importante foi a realização do projeto no tempo determinado, seguindo rigidamente o cronograma e garantindo a qualidade do trabalho refletido no SPI superior a 0,95.

Scanned with CamScanner

ASUGNEWS

REVISTA DA ASUG BRASIL • EDIÇÃO 76 • 18ª CONFERÊNCIA ANUAL 2015 • DISTRIBUIÇÃO GRATUITA



18ª CONFERÊNCIA A

TI SIMPLIFICANDO NEGÓCIOS E PROCESSOS

TEMA DA CONFERÊNCIA MARCA A MAIORIDADE DO PRINCIPAL EVENTO DA ASSOCIAÇÃO, QUE É REFERÊNCIA CORPORATIVA LIGADA AO MUNDO SAP

REUNIÃO SIG BANKING

Experiências de implementação são compartilhadas com networking, temas estratégicos e casos de sucesso

IMPACT AWARDS 2015

CPFL Energia conquista primeiro lugar no prêmio com a implementação do Programa Tauron

Scanned with CamScanner

Exhibit C.II - Second Prong: Evidence of Compensation and Professional Standing

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2023** **CALENDAR YEAR 2022**

TAXPAYER IDENTIFICATION

Name:	LUCIANO APARECIDO DE SOUZA	CPF:	286.551.298-36
Date of Birth:	08/15/1979	Voter ID:	
Do you have a spouse or partner? Yes		CPF of the Spouse or Partner:	166.602.168-71

Were there any changes to the registration details? No

Is one of the declarants a person with a serious illness or a physical or mental disability? No

Address:	RUA JOSE GONCALVES GALEAO	Number:	93
Unit:	APT. 132	Neighborhood/District:	JARDIM AVELINO
City:	SÃO PAULO	State:	SP
ZIP Code:	03227-150	Area Code/Telephone:	
E-mail:		Area Code/Mobile:	

Occupation Type: 01 - EMPLOYEE OF A PRIVATE SECTOR COMPANY, EXCEPT FINANCIAL INSTITUTIONS
Main Occupation: 000 - Other occupations not previously specified
Type of Declaration: Amended Declaration
Receipt Number of the last declaration filed in the 2023 tax year: 42.41.75.07.24-26

DEPENDENTS

CODE	NAME	DATE OF BIRTH	CPF
11	CRISTIANE ARICA FIORITI SOUZA	08/11/1976	166.602.168-71
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			
21	EMILLY FIORITI SOUZA	09/15/2014	582.933.638-35
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			
21	ALANA FIORITI SOUZA	06/19/2016	582.886.808-01
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			

TOTAL DEDUCTION WITH DEPENDENTS 6.825,24

ALIMONY RECIPIENTS

No Information

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE TAXPAYER

(Values in Reais)

NAME OF THE PAYING SOURCE	INCOME RECEIVED FROM LEGAL ENTITY	OFFICIAL SOCIAL SECURITY CONTRIBUTION	WITHHELD TAX	13th SALARY	INCOME TAX WITHHELD ON 13th SALARY
E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA CNPJ/CPF: 12.349.468/0001-75	61.538,13	6.769,17	6.347,34	0,00	0,00
TOTAL	61.538,13	6.769,17	6.347,34	0,00	0,00

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY DEPENDENTS

No Information

TAXABLE INCOME RECEIVED FROM INDIVIDUALS AND ABROAD BY THE TAXPAYER

No Information

TAXABLE INCOME RECEIVED FROM INDIVIDUALS AND ABROAD BY DEPENDENTS

No Information

EXEMPT AND NON-TAXABLE INCOME

(Values in Reais)

12. Income from savings accounts, mortgage bonds, agribusiness, and real estate letters of credit (LCA and LCI), and certificates of agribusiness and real estate receivables (CRA and CRI) 13,42

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	60.701.190/0001-04	ITAU UNIBANCO S.A.	13,42

13. Income of a partner or owner of a microenterprise or small business opting for the Simples Nacional, except for pro labore, rents, and services rendered 710.172,51

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	12.349.468/0001-75	E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	710.172,51

99. Others 178,74

Beneficiary	CPF	CPF/CNPJ of the Paying Source	Name of the Paying Source	Description	Amount
Taxpayer	286.551.298-36	11.214.907/0001-70	DEPARTAMENTO DE ORCAMENTO E FINANCAS	INCOME PAID AND WITHHOLDING TAX RETAINED	178,74

TOTAL 710.364,67

INCOME SUBJECT TO EXCLUSIVE/DEFINITIVE TAXATION

(Values in Reais)

06. Income from financial investments 3,47

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Dependent	166.602.168-71	60.746.948/0001-12	BANCO BRADESCO S/A.	3,47

TOTAL 3,47

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE TAXPAYER (TAX WITH SUSPENDED EXIGIBILITY)

No Information

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE DEPENDENTS (TAX WITH SUSPENDED EXIGIBILITY)

No Information

TAXABLE INCOME FROM LEGAL ENTITY RECEIVED CUMULATIVELY BY THE TAXPAYER

No Information

TAXABLE INCOME FROM LEGAL ENTITY RECEIVED CUMULATIVELY BY THE DEPENDENTS

No Information

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2023** **CALENDAR YEAR 2022**

TAX PAID / WITHHELD

(Values in Reais)

01. Complementary Tax	0,00
02. Tax paid abroad by the taxpayer and dependents	0,00
Tax due with income abroad	0,00
Tax due without income abroad	0,00
Difference to be considered for tax calculation (legal limit)	0,00
03. Income Tax Withheld at Source (Law 11.033/2004):	0,00
04. Income Tax Withheld at Source for the Taxpayer	6.347,34
05. Income Tax Withheld at Source for the Dependents	0,00
06. Taxpayer's Carnê-Leão*	0,00
07. Dependent's Carnê-Leão	0,00

CARNÊ-LEÃO - (Income tax that must be paid monthly, mandatorily, by individuals residing in Brazil who receive income from another individual or from abroad)

PAYMENTS MADE

(Values in Reais)

CODE	BENEFICIARY NAME	BENEFICIARY CPF/CNPJ	AMOUNT PAID	NON-DEDUCTIBLE PORTION
Taxpayer				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	8.492,00	7.402,00
Description: HEALTH INSURANCE PLAN PAYMENT				
Dependent: EMILLY FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	36.048,39	0,00
Description: PROOF OF PAYMENT BASE YEAR 2022, ENROLLMENT NUMBER 116140887, DEDUCTIBLE AMOUNT R$ 35.883,00				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	1.690,00	1.600,00
Description: HEALTH INSURANCE PLAN PAYMENT				
Dependent: CRISTIANE ARICA FIORITI SOUZA				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	6.552,00	6.154,23
Description: HEALTH INSURANCE PLAN PAYMENT				
Dependent: ALANA FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	34.379,07	0,00
Description: PROOF OF PAYMENT BASE YEAR 2022, ENROLLMENT NUMBER 116140879, DEDUCTIBLE AMOUNT R$ 34.156,80				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	1.690,00	1.600,00
Description: HEALTH INSURANCE PLAN PAYMENT				

DONATIONS MADE

No Information

STATEMENTS OF ASSETS AND RIGHTS (Values in Reais)

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2021	STATUS ON 12/31/2022
01	11	ACQUISITION OF APARTMENT NO. 132C, LOCATED AT RUA JOSÉ GONÇALVES GALEÃO, NO. 93, JARDIM AVELINO, SÃO PAULO, SP, FOR THE AMOUNT OF R$ 595.000, WITH R$ 435.000 FINANCED OVER 180 MONTHS AND R$ 165.000 PAID UPFRONT.	595.000,00	595.000,00

105 - BRAZIL
Municipal registration (IPTU):
Address: RUA JOSÉ GONÇALVES GALEÃO No.: 93
Unit: Neighborhood: JARDIM AVELINO
City: SÃO PAULO State: SP ZIP Code:
Total Area: 0,0 Acquisition Date: / /
Registered at the Notary Office:

02	01	HONDA CIVIC EXL YEAR 2009, MODEL 2010, LICENSE PLATE EMG8503.	17.232,00	17.232,00

105 - BRAZIL
RENAVAM (National Registry of Motor Vehicles): 00000000000

03	02	630 SHARES AT R$ 50,00 EACH, TOTAL VALUE R$ 31.500 OF THE COMPANY E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 50,00 EACH, TOTAL R$ 10.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 1.520.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021.	0,00	1.561.500,00

105 - BRAZIL
Asset or right belonging to: Taxpayer CPF: 286.551.298-36
CNPJ: 12.349.468/0001-75

03	02	630 SHARES AT R$ 10,00 EACH, TOTAL VALUE R$ 6.300 OF THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 10,00 EACH, TOTAL R$ 2.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 80.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021.	0,00	88.300,00

105 - BRAZIL
Asset or right belonging to: Taxpayer CPF: 286.551.298-36
CNPJ: 31.412.442/0001-79

03	02	99% OF THE SHARE CAPITAL OF THE COMPANY LUAP DATA INFORMÁTICA LTDA.	5.940,00	5.940,00

105 - BRAZIL
Asset or right belonging to: Taxpayer CPF: 286.551.298-36
CNPJ: 07.519.842/0001-01

STATEMENTS OF ASSETS AND RIGHTS

(Values in Reais)

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2021	STATUS ON 12/31/2022
04	99	SAVINGS ACCOUNT, BRANCH 4054, SAVINGS ACCOUNT 2780-2	59,64	114,64
105 - BRAZIL				
Asset or right belonging to:		Taxpayer	CPF: 286.551.298-36	
CNPJ: 60.701.190/0001-04				
06	01	CHECKING ACCOUNT	10,00	5,00
105 - BRAZIL				
Asset or right belonging to:		Taxpayer	CPF: 286.551.298-36	
CNPJ: 60.701.190/0001-04				
Bank: 341	Branch: 4054	Account: 2780-2		
06	01	CHECKING ACCOUNT BANCO BRADESCO	39,64	1.035,07
105 - BRAZIL				
Asset or right belonging to:		Dependent	CPF: 166.602.168-71	
CNPJ: 60.746.948/0001-12				
Bank: 237	Branch: 1362	Account: 19827-7		
06	01	CHECKING ACCOUNT, BANCO C6 S/A.	99,74	271,53
105 - BRAZIL				
Asset or right belonging to:		Taxpayer	CPF: 286.551.298-36	
CNPJ: 31.872.495/0001-72				
Bank: 336	Branch: 0001	Account: 7614102-0		
TOTAL			618.381,02	2.269.398,24

ENCUMBRANCES AND REAL LIABILITIES

(Values in Reais)

CODE	DISCLOSURE	STATUS ON 12/31/2021	STATUS ON 12/31/2022	AMOUNT PAID IN 2022
11	REAL ESTATE CREDIT, BANCO ITAU, CONTRACT 10118394007, INSTALLMENTS PAID R$ 41.588,70	0,00	86.710,31	41.588,70
13	FROM THE COMPANY E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 50,00 EACH, TOTAL R$ 10.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 1.520.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. IN 2021 PAID R$ 117.500. IN 2022 PAID R$ 282.000	0,00	1.120.500,00	399.500,00

13	FROM THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 10,00 EACH, TOTAL R$ 2.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 80.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. IN 2021 PAID R$ 6.250. IN 2022 PAID R$ 15.000.	0,00	58.750,00	21.250,00
TOTAL		0,00	1.265.960,31	462.338,70

DONATIONS TO POLITICAL PARTIES AND CANDIDATES FOR ELECTIVE OFFICES

No Information

STATEMENT OF RURAL ACTIVITY - BRAZIL

IDENTIFICATION DATA OF THE EXPLORED PROPERTY - BRAZIL

No Information

INCOME AND EXPENSES - BRAZIL

No Information

CALCULATION OF THE RESULT - BRAZIL

No Information

LIVESTOCK ACTIVITY - BRAZIL

No Information

ASSETS OF RURAL ACTIVITY - BRAZIL

No Information

DEBTS RELATED TO RURAL ACTIVITY - BRAZIL

No Information

STATEMENT OF RURAL ACTIVITY - ABROAD

IDENTIFICATION DATA OF THE EXPLORED PROPERTY - ABROAD

No Information

INCOME AND EXPENSES - ABROAD

No Information

CALCULATION OF THE RESULT - ABROAD

No Information

LIVESTOCK ACTIVITY - ABROAD

No Information

ASSETS OF RURAL ACTIVITY - ABROAD

No Information

DEBTS RELATED TO RURAL ACTIVITY - ABROAD

No Information

STATEMENT OF CAPITAL GAINS CALCULATION

No Information

VARIABLE INCOME - COMMON OPERATIONS/DAY TRADE - TAXPAYER

NET GAINS OR LOSSES - JAN

No Information

NET GAINS OR LOSSES - FEB

No Information

NET GAINS OR LOSSES - MAR

No Information

NET GAINS OR LOSSES - APR

No Information

NET GAINS OR LOSSES - MAY

No Information

NET GAINS OR LOSSES - JUN

No Information

NET GAINS OR LOSSES - JUL

No Information

NET GAINS OR LOSSES - AUG

No Information

NET GAINS OR LOSSES - SEP

No Information

NET GAINS OR LOSSES - OCT

No Information

NET GAINS OR LOSSES - NOV

No Information

NET GAINS OR LOSSES - DEC

No Information

VARIABLE INCOME - COMMON OPERATIONS/DAY TRADE - DEPENDENTS

No Information

REAL ESTATE INVESTMENT FUNDS OR IN AGRO-INDUSTRIAL PRODUCTION CHAINS - TAXPAYER

No Information

REAL ESTATE INVESTMENT FUNDS OR IN AGRO-INDUSTRIAL PRODUCTION CHAINS - DEPENDENTS

No Information

DONATIONS DIRECTLY IN THE DECLARATION – ECA (STATUTE OF THE CHILD AND ADOLESCENT)

No Information

DONATIONS DIRECTLY IN THE DECLARATION - ELDERLY

No Information

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2023** **CALENDAR YEAR 2022**

SUMMARY — TAXATION USING THE LEGAL DEDUCTION

TAXABLE INCOME

Received from Legal Entity by the taxpayer	61.538,13
Received from Legal Entity by dependents	0,00
Received from Individual/Abroad by the taxpayer	0,00
Received from Individual/Abroad by Dependents	0,00
Received Cumulatively by the taxpayer	0,00
Received Cumulatively by dependents	0,00
Taxable Income from Rural Activity	0,00
TOTAL	61.538,13

DEDUCTIONS

Contributions to the official and closed complementary pension systems referred to in § 15 of Article 40 of the CF (Federal Constitution)/1988 (up to the sponsor limit)	6.769,17
Contribution to the official pension system (Income received cumulatively)	0,00
Contribution to the complementary pension system, including the amount for the closed systems referred to in Article 40, § 15, of the CF (Federal Constitution)/1988, which exceeds the sponsor's limit	0,00
Dependents	6.825,24
Education Expenses	7.123,00
Medical Expenses	1.667,77
Judicial Alimony	0,00
Alimony by Public Deed	0,00
Judicial Alimony (Income received cumulatively)	0,00
Cash Book	0,00
TOTAL	22.385,18

TAX DUE

Tax Base	39.152,95
Tax Due	1.615,37
Incentive Deduction	0,00
Tax Due I	1.615,37
Tax Due RRA (on received accumulated income)	0,00
Effective Tax Rate (%)	2,62
Total Tax Due	1.615,37

TAX PAID

Tax Withheld at Source by the Taxpayer	6.347,34
Tax Withheld at Source by Dependents	0,00
Taxpayer's Carnê-Leão	0,00
Dependents' Carnê-Leão	0,00
Complementary Tax	0,00
Tax Paid Abroad	0,00
Tax Withheld at Source (Law No. 11.033/2004)	0,00
Tax Withheld RRA	0,00
Total Tax Paid	6.347,34

TAX TO BE REFUNDED	4.731,97
BALANCE OF TAX PAYABLE	0,00

INSTALLMENT PLAN

Installment Amount	0,00
Number of Installments	0

BANKING INFORMATION

Account Type	Checking Account
Bank	341
Branch (without verification digit)	4054
Account for credit	2780 2

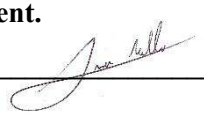
ASSET EVOLUTION

Assets and Rights on 12/31/2021	618.381,02
Assets and Rights on 12/31/2022	2.269.398,24
Encumbrances and Real Liabilities on 12/31/2021	0,00
Encumbrances and Real Liabilities on 12/31/2022	1.265.960,31

OTHER INFORMATION

Exempt and non-taxable income	710.364,67
Income subject to exclusive/definitive taxation	3,47
Taxable income - tax with suspended liability	0,00
Judicial Deposits of Tax	0,00
Tax Paid on Capital Gains	0,00
Tax Paid on Capital Gains Foreign Currency - Assets, Rights, and Financial Investments	0,00
Total tax withheld at source (Law No. 11.033/2004), as per the data provided by the taxpayer	0,00
Tax Paid on Variable Income	0,00
Donations to Political Parties and Candidates for Elective Office	0,00
Tax Payable on Capital Gain - Foreign Currency in Cash	0,00
Deferred Tax on Capital Gains	0,00
Tax Due on Capital Gains	0,00
Tax Due on Net Income from Variable Income	0,00
Tax Due on Capital Gains in Foreign Currency - Assets, Rights, and Financial Investments	0,00

I, André Vinícius Inacio Penna Mello, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 9, 2026

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2023** **ANO-CALENDÁRIO 2022**

IDENTIFICAÇÃO DO CONTRIBUINTE

Nome:	LUCIANO APARECIDO DE SOUZA	CPF:	286.551.298-36
Data de Nascimento:	15/08/1979	Título Eleitoral:	
Possui cônjuge ou companheiro(a)?	Sim	CPF do cônjuge ou companheiro(a):	166.602.168-71
Houve alteração de dados cadastrais?	Não		
Um dos declarantes é pessoa com doença grave ou portadora de deficiência física ou mental?	Não		

Endereço:	RUA JOSE GONCALVES GALEAO	Número:	93
Complemento:	APTO 132	Bairro/Distrito:	JARDIM AVELINO
Município:	SÃO PAULO	UF:	SP
CEP:	03227-150	DDD/Telefone:	
E-mail:		DDD/Celular:	

Natureza da Ocupação:	01 - EMPREGADO DE EMPRESA DO SETOR PRIVADO, EXCETO DE INSTITUIÇÕES FINANCEIRAS
Ocupação Principal:	000 - OUTRAS OCUPAÇÕES NÃO ESPECIFICADAS ANTERIORMENTE
Tipo de declaração:	Declaração Retificadora

Nº do recibo da declaração anterior do exercício de 2023: 42.41.75.07.24-26

DEPENDENTES

CÓDIGO	NOME	DATA DE NASCIMENTO	CPF
11	CRISTIANE ARICA FIORITI SOUZA	11/08/1976	166.602.168-71
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			
21	EMILLY FIORITI SOUZA	15/09/2014	582.933.638-35
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			
21	ALANA FIORITI SOUZA	19/06/2016	582.886.808-01
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			

TOTAL DE DEDUÇÃO COM DEPENDENTES 6.825,24

ALIMENTANDOS

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELO TITULAR

(Valores em Reais)

NOME DA FONTE PAGADORA	REND. RECEBIDOS DE PES. JURÍDICA	CONTR. PREVID. OFICIAL	IMPOSTO RETIDO NA FONTE	13º SALÁRIO	IRRF SOBRE 13º SALÁRIO
E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA CNPJ/CPF: 12.349.468/0001-75	61.538,13	6.769,17	6.347,34	0,00	0,00
TOTAL	61.538,13	6.769,17	6.347,34	0,00	0,00

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELOS DEPENDENTES

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA FÍSICA E DO EXTERIOR PELO TITULAR

Sem Informações

PROTEGIDA POR SIGILO FISCAL

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA FÍSICA E DO EXTERIOR PELOS DEPENDENTES

Sem Informações

RENDIMENTOS ISENTOS E NÃO TRIBUTÁVEIS

(Valores em Reais)

12. Rendimentos de cadernetas de poupança, letras hipotecárias, letras de crédito do agronegócio e imobiliário (LCA e LCI) e certificados de recebíveis do agronegócio e imobiliários (CRA e CRI) 13,42

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	60.701.190/0001-04	ITAU UNIBANCO S.A.	13,42

13. Rendimento de sócio ou titular de microempresa ou empresa de pequeno porte optante pelo Simples Nacional, exceto pro labore, aluguéis e serviços prestados 710.172,51

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	12.349.468/0001-75	E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	710.172,51

99. Outros 178,74

Beneficiário	CPF	CPF/CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Descrição	Valor
Titular	286.551.298-36	11.214.907/0001-70	DEPARTAMENTO DE ORCAMENTO E FINANCAS	RENDIMENTOS PAGOS E RETENCAO DE IRF	178,74

TOTAL 710.364,67

RENDIMENTOS SUJEITOS À TRIBUTAÇÃO EXCLUSIVA / DEFINITIVA

(Valores em Reais)

06. Rendimentos de aplicações financeiras 3,47

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Dependente	166.602.168-71	60.746.948/0001-12	BANCO BRADESCO S/A.	3,47

TOTAL 3,47

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELO TITULAR (IMPOSTO COM EXIGIBILIDADE SUSPENSA)

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELOS DEPENDENTES (IMPOSTO COM EXIGIBILIDADE SUSPENSA)

Sem Informações

RENDIMENTOS TRIBUTÁVEIS DE PESSOA JURÍDICA RECEBIDOS ACUMULADAMENTE PELO TITULAR

Sem Informações

RENDIMENTOS TRIBUTÁVEIS DE PESSOA JURÍDICA RECEBIDOS ACUMULADAMENTE PELOS DEPENDENTES

Sem Informações

PROTEGIDA POR SIGILO FISCAL

IMPOSTO PAGO / RETIDO

(Valores em Reais)

01. Imposto complementar	0,00
02. Imposto pago no exterior pelo titular e pelos dependentes	0,00
Imposto devido com os rendimentos no exterior	0,00
Imposto devido sem os rendimentos no exterior	0,00
Diferença a ser considerada para cálculo do imposto (limite legal)	0,00
03. Imposto sobre a renda na fonte (Lei 11.033/2004)	0,00
04. Imposto retido na fonte do titular	6.347,34
05. Imposto retido na fonte dos dependentes	0,00
06. Carnê-Leão do titular	0,00
07. Carnê-Leão dos dependentes	0,00

PAGAMENTOS EFETUADOS

(Valores em Reais)

CÓD.	NOME DO BENEFICIÁRIO	CPF/CNPJ DO BENEFICIÁRIO	VALOR PAGO	PARC. NÃO DEDUTÍVEL
Titular				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	8.492,00	7.402,00
Descrição: PAGAMENTO DE PLANO DE SAUDE				
Dependente: EMILLY FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	36.048,39	0,00
Descrição: COMPROVANTE PAGAMENTO ANO BASE 2022, NUMERO DA MATRICULA 116140887, VALOR DEDUTIVEL R$ 35.883,00				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	1.690,00	1.600,00
Descrição: PAGAMENTO PLANO DE SAUDE				
Dependente: CRISTIANE ARICA FIORITI SOUZA				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	6.552,00	6.154,23
Descrição: PAGAMENTO PLANO DE SAUDE				
Dependente: ALANA FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	34.379,07	0,00
Descrição: COMPROVANTE DE PAGAMENTO ANO BASE. 2022, NUMERO MATRICULA 116140879, VALOR DEDUTIVEL R$ 34.156,80				
26	AMIL ASSISTENCIA MEDICA INTERNACIONAL S/A.	29.309.127/0001-79	1.690,00	1.600,00
Descrição: PAGAMENTO PLANO DE SAUDE				

DOAÇÕES EFETUADAS

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DECLARAÇÃO DE BENS E DIREITOS (Valores em Reais)

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2021	SITUAÇÃO EM 31/12/2022
01	11	AQUISIÇÃO DE APTO NO 132C, SITUADO A RUA JOSÉ GONÇALVES GALEÃO, NO 93, JARDIM AVELINO, SÃO PAULO, SP, PELO VALOR DE R$ 595.000, SENDO FINANCIADO EM 180 MESES O VALOR DE R$ 435.000 E R$ 165.000 PAGO A VISTA.	595.000,00	595.000,00

105 - BRASIL
Inscrição Municipal (IPTU):
Logradouro: RUA JOSÉ GONÇALVES GALEÃO Nº: 93
Comp.: Bairro: JARDIM AVELINO
Município: SÃO PAULO UF: SP CEP:
Área Total: 0,0 Data de Aquisição: / /
Registrado no Cartório:

02	01	HONDA CIVIC EXL AON 2009, MODELO 2010, PLACA EMG8503.	17.232,00	17.232,00

105 - BRASIL
RENAVAM: 00000000000

03	02	630 QUOTAS A R$ 50,00 CADA, VALOR TOTAL R$ 31.500 DA EMPRESA E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 50,00, TOTAL R$ 10.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 1.520.000, CONFORME CONTRATO PARTICULAR DE 08/2021.	0,00	1.561.500,00

105 - BRASIL
Bem ou direito pertencente ao: Titular CPF: 286.551.298-36
CNPJ: 12.349.468/0001-75

03	02	630 QUOTAS A R$ 10,00 CADA, VALOR TOTAL R$ 6.300 DA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 10,00, TOTAL R$ 2.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 80.000, CONFORME CONTRATO PARTICULAR DE 08/2021.	0,00	88.300,00

105 - BRASIL
Bem ou direito pertencente ao: Titular CPF: 286.551.298-36
CNPJ: 31.412.442/0001-79

03	02	99% DAS QUOTAS SOCIAIS DA EMPRESA LUAP DATA INFORMÁTICA LTDA.	5.940,00	5.940,00

105 - BRASIL
Bem ou direito pertencente ao: Titular CPF: 286.551.298-36
CNPJ: 07.519.842/0001-01

PROTEGIDA POR SIGILO FISCAL

DECLARAÇÃO DE BENS E DIREITOS

(Valores em Reais)

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2021	SITUAÇÃO EM 31/12/2022
04	99	CONTAS DE POUPANCA, AGENCIA 4054, CONTA POUPANCA 2780-2	59,64	114,64
105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 60.701.190/0001-04				
06	01	CONTA CORRENTE	10,00	5,00
105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 60.701.190/0001-04 Banco: 341 Agência: 4054 Conta: 2780-2				
06	01	CONTA CORRENTE BANCO BRADESCO	39,64	1.035,07
105 - BRASIL Bem ou direito pertencente ao: Dependente CPF: 166.602.168-71 CNPJ: 60.746.948/0001-12 Banco: 237 Agência: 1362 Conta: 19827-7				
06	01	CONTA CORRENTE, BANCO C6 S/A.	99,74	271,53
105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 31.872.495/0001-72 Banco: 336 Agência: 0001 Conta: 7614102-0				
TOTAL			618.381,02	2.269.398,24

DÍVIDAS E ÔNUS REAIS

(Valores em Reais)

CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2021	SITUAÇÃO EM 31/12/2022	VALOR PAGO EM 2022
11	CREDITO IMOBILIARIO, BANCO ITAU, CONTRATO 10118394007, PARCELAS PAGAS R$ 41.588,70	0,00	86.710,31	41.588,70
13	DA EMPRESA E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 50,00, TOTAL R$ 10.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 1.520.000, CONFORME CONTRATO PARTICULAR DE 08/2021. EM 2021 PAGO R$ 117.500. EM 2022 PAGO R$ 282.000	0,00	1.120.500,00	399.500,00

PROTEGIDA POR SIGILO FISCAL

13	DA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 10,00, TOTAL R$ 2.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 80.000, CONFORME CONTRATO PARTICULAR DE 08/2021. PAGO EM 2021 R$ 6.250. PAGO EM 2022 R$ 15.000.	0,00	58.750,00	21.250,00
TOTAL		0,00	1.265.960,31	462.338,70

DOAÇÕES A PARTIDOS POLÍTICOS E CANDIDATOS A CARGOS ELETIVOS

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DEMONSTRATIVO DE ATIVIDADE RURAL - BRASIL

DADOS E IDENTIFICAÇÃO DO IMÓVEL EXPLORADO - BRASIL

Sem Informações

RECEITAS E DESPESAS - BRASIL

Sem Informações

APURAÇÃO DO RESULTADO - BRASIL

Sem Informações

MOVIMENTAÇÃO DO REBANHO - BRASIL

Sem Informações

BENS DA ATIVIDADE RURAL - BRASIL

Sem Informações

DÍVIDAS VINCULADAS À ATIVIDADE RURAL - BRASIL

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DEMONSTRATIVO DE ATIVIDADE RURAL - EXTERIOR

DADOS E IDENTIFICAÇÃO DO IMÓVEL EXPLORADO - EXTERIOR

Sem Informações

RECEITAS E DESPESAS - EXTERIOR

Sem Informações

APURAÇÃO DO RESULTADO - EXTERIOR

Sem Informações

MOVIMENTAÇÃO DO REBANHO - EXTERIOR

Sem Informações

BENS DA ATIVIDADE RURAL - EXTERIOR

Sem Informações

DÍVIDAS VINCULADAS À ATIVIDADE RURAL - EXTERIOR

Sem Informações

DEMONSTRATIVO DA APURAÇÃO DOS GANHOS DE CAPITAL

Sem Informações

PROTEGIDA POR SIGILO FISCAL

RENDA VARIÁVEL - OPERAÇÕES COMUNS/DAYTRADE - TITULAR

GANHOS LÍQUIDOS OU PERDAS - JAN

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - FEV

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - MAR

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - ABR

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - MAI

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - JUN

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - JUL

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - AGO

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - SET

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - OUT

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - NOV

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - DEZ

Sem Informações

RENDA VARIÁVEL - OPERAÇÕES COMUNS/DAYTRADE - DEPENDENTES

Sem Informações

FUNDOS DE INVESTIMENTO IMOBILIÁRIO OU NAS CADEIAS PRODUTIVAS AGROINDUSTRIAIS - TITULAR

Sem Informações

FUNDOS DE INVESTIMENTO IMOBILIÁRIO OU NAS CADEIAS PRODUTIVAS AGROINDUSTRIAIS - DEPENDENTES

Sem Informações

DOAÇÕES DIRETAMENTE NA DECLARAÇÃO - ECA

Sem Informações

DOAÇÕES DIRETAMENTE NA DECLARAÇÃO - IDOSO

Sem Informações

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2023** **ANO-CALENDÁRIO 2022**

RESUMO — TRIBUTAÇÃO UTILIZANDO AS DEDUÇÕES LEGAIS

RENDIMENTOS TRIBUTÁVEIS

Recebidos de Pessoa Jurídica pelo titular	61.538,13
Recebidos de Pessoa Jurídica pelos dependentes	0,00
Recebidos de Pessoa Física/Exterior pelo titular	0,00
Recebidos de Pessoa Física/Exterior pelos dependentes	0,00
Recebidos acumuladamente pelo titular	0,00
Recebidos acumuladamente pelos dependentes	0,00
Resultado tributável da Atividade Rural	0,00
TOTAL	61.538,13

DEDUÇÕES

Contribuições às previdências oficial e complementar fechada de que trata o § 15 do art. 40 da CF/1988 (até o limite do patrocinador)	6.769,17
Contribuição à previdência oficial (Rendimentos recebidos acumuladamente)	0,00
Contribuição à prev. complementar, inclusive o valor para as fechadas de que trata o § 15 do art. 40 da CF/1988 que exceder o limite do patrocinador	0,00
Dependentes	6.825,24
Despesas com instrução	7.123,00
Despesas médicas	1.667,77
Pensão alimentícia judicial	0,00
Pensão alimentícia por escritura pública	0,00
Pensão alimentícia judicial (Rendimentos recebidos acumuladamente)	0,00
Livro caixa	0,00
TOTAL	22.385,18

IMPOSTO DEVIDO

Base de cálculo do imposto	39.152,95
Imposto devido	1.615,37
Dedução de incentivo	0,00
Imposto devido I	1.615,37
Imposto devido RRA	0,00
Aliquota efetiva (%)	2,62
Total do imposto devido	1.615,37

IMPOSTO PAGO

Imposto retido na fonte do titular	6.347,34
Imp. retido na fonte dos dependentes	0,00
Carnê-Leão do titular	0,00
Carnê-Leão dos dependentes	0,00
Imposto complementar	0,00
Imposto pago no exterior	0,00
Imposto retido na fonte (Lei nº 11.033/2004)	0,00
Imposto retido RRA	0,00
Total do imposto pago	6.347,34

IMPOSTO A RESTITUIR	4.731,97
SALDO DE IMPOSTO A PAGAR	0,00

PARCELAMENTO

Valor da quota	0,00
Número de Quotas	0

INFORMAÇÕES BANCÁRIAS

Tipo de Conta	Conta Corrente
Banco	341
Agência (sem DV)	4054
Conta para crédito	2780 2

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2023** **ANO-CALENDÁRIO 2022**

EVOLUÇÃO PATRIMONIAL

Bens e direitos em 31/12/2021	618.381,02
Bens e direitos em 31/12/2022	2.269.398,24
Dívidas e ônus reais em 31/12/2021	0,00
Dívidas e ônus reais em 31/12/2022	1.265.960,31

OUTRAS INFORMAÇÕES

Rendimentos isentos e não tributáveis	710.364,67
Rendimentos sujeitos à tributação exclusiva/definitiva	3,47
Rendimentos tributáveis - imposto com exigibilidade suspensa	0,00
Depósitos judiciais do imposto	0,00
Imposto pago sobre Ganhos de Capital	0,00
Imposto pago Ganhos de Capital Moeda Estrangeira - Bens, direitos e Aplicações Financeiras	0,00
Total do imposto retido na fonte (Lei nº11.033/2004), conforme dados informados pelo contribuinte	0,00
Imposto pago sobre Renda Variável	0,00
Doações a Partidos Políticos e Candidatos a Cargos Eletivos	0,00
Imposto a pagar sobre o Ganho de Capital - Moeda Estrangeira em Espécie	0,00
Imposto diferido dos Ganhos de Capital	0,00
Imposto devido sobre Ganhos de Capital	0,00
Imposto devido sobre ganhos líquidos em Renda Variável	0,00
Imposto devido sobre Ganhos de Capital Moeda Estrangeira - Bens, direitos e aplic. financeiras	0,00

PROTEGIDA POR SIGILO FISCAL

MINISTRY OF FINANCE **INCOME TAX - INDIVIDUAL**

SPECIAL SECRETARIAT OF THE FEDERAL REVENUE OF BRAZIL TAX YEAR 2023 CALENDAR YEAR 2022

RECEIPT FOR THE SUBMISSION OF THE ANNUAL ADJUSTMENT DECLARATION - OPTION FOR LEGAL DEDUCTIONS

AMENDED DECLARATION No. 1

TAXPAYER IDENTIFICATION

CPF of the taxpayer	Name of the taxpayer	Telephone
286.551.298-36	LUCIANO APARECIDO DE SOUZA	

Address	Number	Unit
RUA JOSE GONCALVES GALEAO	93	APT. 132

Neighborhood/District	ZIP Code	City	State
JARDIM AVELINO	03227-150	SAO PAULO	SP

(Values in Reais)

TOTAL TAXABLE INCOME	61.538,13
TAX DUE	1.615,37
TAX TO BE REFUNDED	4.731,97
BALANCE OF TAX PAYABLE	0,00
TAX PAYABLE CAPITAL GAIN – CURRENCY IN CASH	0,00
REFUND BANK CODE	341
BRANCH	4054
ACCOUNT FOR CREDIT	2780-2

Declaration received via Internet JV
by the Receiving Agent SERPRO
(Federal Data Processing Service)
on 10/05/2023 at 11:00:30 am
1822682915

MINISTRY OF FINANCE **INCOME TAX - INDIVIDUAL**

SPECIAL SECRETARIAT OF THE FEDERAL REVENUE OF BRAZIL TAX YEAR 2023 CALENDAR YEAR 2022

Mr. LUCIANO APARECIDO DE SOUZA, registered under the CPF No 286.551.298-36.

THE RECEIPT NUMBER for your declaration submitted on 10/05/2023, at 11:00:30 am, is:

41.48.62.64.85 - 99

This number is for personal use and SHOULD NOT be provided to third parties. It is mandatory for:

- rectifying this declaration;
- generating an access code for obtaining information and performing services available on the website of the Special Secretariat of the Federal Revenue of Brazil such as:
  - My Income Tax (DIRPF – Individual Tax Return - Statement):
    - information on the processing status;
    - presentation of any pending issues and guidance on how to resolve them;
    - modification or cancellation of automatic installment payments;
    - Display of overdue tax installments and issuance of updated Documents for Federal Revenue Collection (Darf).
  - Tax Status:
    - Information on any pending issues, including those related to the Federal Government's Active Debt, and guidance on how to regularize them.

Attention: Keep this number to provide it in the 2024 tax return, in the field "previous year's declaration receipt number ".

Information on the Darf Printing

The Annual Adjustment Statement Program for Individual Income Tax allows the printing of the Darf for the payment of all installments, including those overdue. The Darf will be printed with interest equivalent to the reference rate of the Special System for Settlement and Custody (Selic) for federal securities, accumulated monthly, calculated from 06/01/2023 until the month prior to payment, and 1% in the month of payment.

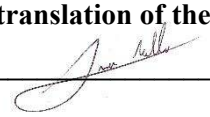
If the installment payment is made after its due date, a late payment penalty of 0.33% per day will apply, with a maximum limit of 20%.

For printing the Darf, the taxpayer should use the option **Declaration** / **Print** / **Darf of the IRPF** and select the installment for printing.

In the case of installments resulting from amended declarations that lead to a change in tax payable, for printing the DARF, access the e-CAC Portal on the RFB (Brazilian Federal Revenue) website at (http://gov.br/receitafederal). Then, click on **"Declarations and Statements"**, select the service **"My Income Tax (DIRPF Statement Extract)"**. In the list of services found, click on "**Payment** - **Check Debts, Issue DARF**, and **Change Installments**". After viewing the quantity of installments and the status of each one, click on the "**Print**" icon to generate the DARF for the desired month.

Follow the processing of your declaration on the e-CAC or on your mobile device.

I, André Vinícius Inacio Penna Mello, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 16, 2026.

MINISTÉRIO DA FAZENDA	IMPOSTO SOBRE A RENDA - PESSOA FÍSICA
SECRETARIA ESPECIAL DA RECEITA FEDERAL DO BRASIL	EXERCÍCIO 2023 ANO-CALENDÁRIO 2022

RECIBO DE ENTREGA DA DECLARAÇÃO DE AJUSTE ANUAL - OPÇÃO PELAS DEDUÇÕES LEGAIS

DECLARAÇÃO RETIFICADORA Nº 1

IDENTIFICAÇÃO DO DECLARANTE

CPF do declarante	Nome do declarante	Telefone
286.551.298-36	LUCIANO APARECIDO DE SOUZA	

Endereço	Número	Complemento
RUA JOSE GONCALVES GALEAO	93	APTO 132

Bairro/Distrito	CEP	Município	UF
JARDIM AVELINO	03227-150	SAO PAULO	SP

(Valores em Reais)

TOTAL RENDIMENTOS TRIBUTÁVEIS	61.538,13
IMPOSTO DEVIDO	1.615,37
IMPOSTO A RESTITUIR	4.731,97
SALDO DO IMPOSTO A PAGAR	0,00
IMPOSTO A PAGAR GANHO DE CAPITAL - MOEDA EM ESPÉCIE	0,00

RESTITUIÇÃO CÓDIGO DO BANCO	341
AGÊNCIA BANCÁRIA	4054
CONTA PARA CRÉDITO	2780-2

Declaração recebida via Internet JV
pelo Agente Receptor SERPRO
em 05/10/2023 às 11:00:30
1822682915

MINISTÉRIO DA FAZENDA **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**

SECRETARIA ESPECIAL DA RECEITA FEDERAL DO BRASIL **EXERCÍCIO 2023** **ANO-CALENDÁRIO 2022**

Sr(a) LUCIANO APARECIDO DE SOUZA, inscrito no CPF sob o nº 286.551.298-36.

O NÚMERO DO RECIBO de sua declaração apresentada em 05/10/2023, às 11:00:30, é:

41.48.62.64.85 - 99

Este número é de uso pessoal e NÃO deve ser fornecido a terceiros. Ele é obrigatório para:

- retificar esta declaração;
- gerar um código de acesso para obter informações e realizar serviços disponíveis na página da Secretaria Especial da Receita Federal do Brasil na Internet, tais como:
  - Meu Imposto de Renda (Extrato da DIRPF):
    - informação da situação do processamento;
    - apresentação de eventuais pendências e orientações sobre como resolvê-las;
    - alteração ou cancelamento de débito automático das quotas;
    - exibição de quotas do imposto em atraso e emissões dos Documentos de Arrecadação de Receitas Federais (Darf) atualizados.
  - Situação Fiscal:
    - Informação de eventuais pendências, inclusive as relativas à Dívida Ativa da União, e orientação sobre como regularizá-las.

Atenção: Guarde este número para informá-lo na declaração do exercício de 2024, no campo "número do recibo da declaração do ano anterior".

Informações sobre a Impressão do Darf

O programa da Declaração de Ajuste Anual do Imposto sobre a Renda da Pessoa Física permite a impressão do Darf para pagamento de todas as quotas, inclusive as em atraso. O Darf será impresso acrescido de juros equivalentes à taxa referencial do Sistema Especial de Liquidação e Custódia (Selic), para títulos federais, acumulada mensalmente, calculados a partir de 01/06/2023 até o mês anterior ao do pagamento e de 1% no mês do pagamento.

Se o pagamento da quota for efetuado após o seu vencimento, incidirá multa de mora de 0,33% ao dia, observado o limite máximo de 20%.

Para impressão do Darf o contribuinte deve utilizar a opção **Declaração** / **Imprimir** / **Darf do IRPF** e selecionar a quota para impressão.

No caso de quotas decorrentes de declarações retificadoras em que ocorra mudança de imposto a pagar, para impressão do DARF acesse o Portal e-CAC no site da Receita Federal na Internet (https://www.gov.br/receitafederal/pt-br). Em seguida, clique em "**Declarações e Demonstrativos**", selecione o serviço "**Meu Imposto de Renda (Extrato da DIRPF)**". Na lista dos Serviços encontrados, clique em "**Pagamento - Consultar Débitos, Emitir DARF e Alterar Quotas**". Após visualizar o quantitativo de quotas e a situação de cada uma delas, clique no ícone "**Impressão**" para emitir o DARF do mês desejado.

Acompanhe o processamento da sua declaração no e-CAC ou no seu dispositivo móvel.

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2024** **CALENDAR YEAR 2023**

TAXPAYER IDENTIFICATION

Name:	LUCIANO APARECIDO DE SOUZA	CPF:	286.551.298-36
Date of Birth:	08/15/1979	Voter ID:	
Do you have a spouse or partner? Yes		CPF of the spouse or partner:	166.602.168-71

Were you a resident abroad and became a resident in Brazil in 2023? No

Were there any changes to the registration details? No

Is one of the declarants a person with a serious illness or a physical or mental disability? No

Address:	RUA JOSE GONCALVES GALEAO	Number:	93
Unit:	APT. 132	Neighborhood/District:	JARDIM AVELINO
City:	SÃO PAULO	State:	SP
ZIP Code:	03227-150	Area Code/Telephone:	
E-mail:		Area Code/Mobile:	

Occupation Type: 01 - EMPLOYEE OF A PRIVATE SECTOR COMPANY, EXCEPT FINANCIAL INSTITUTIONS
Main Occupation: 000 - OTHER OCCUPATIONS NOT PREVIOUSLY SPECIFIED
Type of Declaration: Amended Declaration
Receipt Number of the last declaration filed in the 2024 tax year: 25.96.21.68.53-44

DEPENDENTS

CODE	NAME	DATE OF BIRTH	CPF
21	EMILLY FIORITI SOUZA	09/15/2014	582.933.638-35
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			
21	ALANA FIORITI SOUZA	06/19/2016	582.886.808-01
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			

TOTAL DEDUCTION WITH DEPENDENTS 4.550,16

ALIMONY RECIPIENTS

No Information

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE TAXPAYER

(Values in Reais)

NAME OF THE PAYING SOURCE	INCOME RECEIVED FROM LEGAL ENTITY	OFFICIAL SOCIAL SECURITY CONTRIBUTION	WITHHELD TAX	13th SALARY	INCOME TAX WITHHELD ON 13th SALARY
E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA CNPJ/CPF: 12.349.468/0001-75	84.720,28	9.319,19	10.178,20	0,00	0,00
CAIXA VIDA E PREVIDENCIA S/A CNPJ/CPF: 03.730.204/0001-76	20.579,73	0,00	3.086,96	0,00	0,00
TOTAL	105.300,01	9.319,19	13.265,16	0,00	0,00

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY DEPENDENTS

No Information

TAXABLE INCOME RECEIVED FROM INDIVIDUALS AND ABROAD BY THE TAXPAYER

No Information

TAXABLE INCOME RECEIVED FROM INDIVIDUALS AND ABROAD BY DEPENDENTS

No Information

EXEMPT AND NON-TAXABLE INCOME

(Values in Reais)

12. Income from savings accounts, mortgage bonds, agribusiness, and real estate letters of credit (LCA and LCI), and certificates of agribusiness and real estate receivables (CRA and CRI) 157,17

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	60.746.948/0001-12	BANCO BRADESCO S.A.	157,17

13. Income of a partner or owner of a microenterprise or small business opting for the Simples Nacional, except for pro labore, rents, and services rendered 270.000,00

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	12.349.468/0001-75	E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	270.000,00

TOTAL 270.157,17

INCOME SUBJECT TO EXCLUSIVE/DEFINITIVE TAXATION

(Values in Reais)

06. Income from financial investments 18,56

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	60.746.948/0001-12	BANCO BRADESCO S.A.	18,28
Taxpayer	286.551.298-36	60.701.190/0001-04	ITAU UNIBANCO S.A.	0,28

TOTAL 18,56

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE TAXPAYER (TAX WITH SUSPENDED EXIGIBILITY)

No Information

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE DEPENDENTS (TAX WITH SUSPENDED EXIGIBILITY)

No Information

TAXABLE INCOME FROM LEGAL ENTITY RECEIVED CUMULATIVELY BY THE TAXPAYER

No Information

TAXABLE INCOME FROM LEGAL ENTITY RECEIVED CUMULATIVELY BY THE DEPENDENTS

No Information

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2024** **CALENDAR YEAR 2023**

TAX PAID / WITHHELD

(Values in Reais)

01. Complementary Tax	0,00
02. Tax paid abroad by the taxpayer and dependents	0,00
Tax due with income abroad	0,00
Tax due without income abroad	0,00
Difference to be considered for tax calculation (legal limit)	0,00
03. Income Tax Withheld at Source (Law 11.033/2004):	0,00
04. Income Tax Withheld at Source for the Taxpayer	13.265,16
05. Income Tax Withheld at Source for the Dependents	0,00
06. Taxpayer's Carnê-Leão*	0,00
07. Dependent's Carnê-Leão	0,00

CARNÊ-LEÃO - (Income tax that must be paid monthly, mandatorily, by individuals residing in Brazil who receive income from another individual or from abroad)

PAYMENTS MADE

(Values in Reais)

CODE	BENEFICIARY NAME	BENEFICIARY CPF/CNPJ	AMOUNT PAID	NON-DEDUCTIBLE PORTION
Dependent: EMILLY FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	47.358,30	0,00
Description: PROOF OF PAYMENT BASE YEAR 2022, ENROLLMENT NUMBER 116140887, DEDUCTIBLE AMOUNT R$ 35.883,00				
Dependent: ALANA FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	45.415,50	0,00
Description: PROOF OF PAYMENT BASE YEAR 2022, ENROLLMENT NUMBER 116140879, DEDUCTIBLE AMOUNT R$ 34.156,80				

DONATIONS MADE

No Information

STATEMENTS OF ASSETS AND RIGHTS

(Values in Reais)

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2022	STATUS ON 12/31/2023
01	11	ACQUISITION OF APARTMENT NO. 132C, LOCATED AT RUA JOSE GONCALVES GALEAO, NO 93, JARDIM AVELINO, SAO PAULO, SP, FOR THE AMOUNT OF R$ 595.000, WITH R$ 435.000 FINANCED OVER 180 MONTHS AND R$ 165.000 PAID UPFRONT. FIDUCIARILY ASSIGNED TO BANCO ITAU AS COLLATERAL FOR THE DEBT IN THE AMOUNT OF R$ 707.0000, TO BE PAID IN 180 INSTALLMENTS OF R$ 10.159,01, WITH THE 1ST DUE ON 07/09/2023.	595.000,00	595.000,00

105 - BRAZIL

Municipal registration (IPTU):

Address: RUA JOSE GONCALVES GALEAO Nº: 93
Unit: AP 132 Bairro: JARDIM AVELINO
City: SÃO PAULO State: SP ZIP Code:

STATEMENTS OF ASSETS AND RIGHTS (Values in Reais)

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2022	STATUS ON 12/31/2023
Total Area: 0,0			Acquisition Date: 06/27/2023	
Registered at the Notary Office:				
02	01	HONDA CIVIC EXL YEAR 2009, MODEL 2010, LICENSE PLATE EMG8503.	17.232,00	17.232,00
105 - BRAZIL				
RENAVAM (National Registry of Motor Vehicles): 00000000000				
03	02	630 SHARES AT R$ 50,00 EACH, TOTAL VALUE R$ 31.500 OF THE COMPANY E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 50,00 EACH, TOTAL R$ 10.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 1.520.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021.	1.561.500,00	1.561.500,00
105 - BRAZIL				
Asset or right belonging to: Taxpayer CPF: 286.551.298-36				
CNPJ: 12.349.468/0001-75				
03	02	630 SHARES AT R$ 10,00 EACH, TOTAL VALUE R$ 6.300 OF THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 10,00 EACH, TOTAL R$ 2.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 80.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021.	88.300,00	88.300,00
105 - BRAZIL				
Asset or right belonging to: Taxpayer CPF: 286.551.298-36				
CNPJ: 31.412.442/0001-79				
03	02	99% OF THE SHARE CAPITAL OF THE COMPANY LUAP DATA INFORMÁTICA LTDA.	5.940,00	5.940,00
105 - BRAZIL				
Asset or right belonging to: Taxpayer CPF: 286.551.298-36				
CNPJ: 07.519.842/0001-01				

STATEMENTS OF ASSETS AND RIGHTS

(Values in Reais)

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2022	STATUS ON 12/31/2023
04	99	SAVINGS ACCOUNT, BRANCH 4054, SAVINGS ACCOUNT 2780-2	114,64	1.026,17

105 - BRAZIL

Asset or right belonging to: Taxpayer CPF: 286.551.298-36
CNPJ: 60.701.190/0001-04

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2022	STATUS ON 12/31/2023
06	01	CHECKING ACCOUNT	5,00	10,00

105 - BRAZIL

Asset or right belonging to: Taxpayer CPF: 286.551.298-36
CNPJ: 60.701.190/0001-04

Bank: 341 Branch: 4054 Account: 2780-2

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2022	STATUS ON 12/31/2023
06	01	CHECKING ACCOUNT, BANCO C6 S/A.	271,53	344,25

105 - BRAZIL

Asset or right belonging to: Taxpayer CPF: 286.551.298-36
CNPJ: 31.872.495/0001-72

Bank: 336 Branch: 0001 Account: 7614102-0

TOTAL	2.268.363,17	2.269.352,42

ENCUMBRANCES AND REAL LIABILITIES

(Values in Reais)

CODE	DISCLOSURE	STATUS ON 12/31/2022	STATUS ON 12/31/2023	AMOUNT PAID IN 2023
11	REAL ESTATE CREDIT, BANCO ITAU, CONTRACT 10118394007, INSTALLMENTS PAID R$ 41.588,70	86.710,31	692.318,49	79.043,18
13	FROM THE COMPANY E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 50,00 EACH, TOTAL R$ 10.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 1.520.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. IN 2021 PAID R$ 118.750,00. IN 2022 PAID R$ 285.000,00. IN 2023 PAID R$ 318.917,89.	1.116.250,00	797.332,11	318.917,89

13	FROM THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 10,00 EACH, TOTAL R$ 2.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 80.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. IN 2021 PAID R$ 6.250. IN 2022 PAID R$ 15.000. IN 2023 PAID R$ 16.785,16.	58.750,00	41.964,84	16.785,16
11	ACQUISITION OF APARTMENT NO. 132C, LOCATED AT JOSÉ GONÇALVES GALEÃO STREET, NO. 93, JARDIM AVELINO, SÃO PAULO, SP, FOR THE AMOUNT OF R$ 595.000, WITH R$ 435.000 FINANCED OVER 180 MONTHS AND R$ 165.000 PAID UPFRONT. FIDUCIARILY ASSIGNED TO BANCO ITAU AS COLLATERAL FOR THE DEBT IN THE AMOUNT OF R$ 707.0000, TO BE PAID IN 180 INSTALLMENTS OF R$ 10.159,01, WITH THE 1ST DUE ON 07/09/2023. PAID ON 2023	0,00	646.045,94	60.954,06
TOTAL		1.261.710,31	2.177.661,38	475.700,29

DONATIONS TO POLITICAL PARTIES AND CANDIDATES FOR ELECTIVE OFFICES

No Information

STATEMENT OF RURAL ACTIVITY - BRAZIL

IDENTIFICATION DATA OF THE EXPLORED PROPERTY - BRAZIL

No Information

INCOME AND EXPENSES - BRAZIL

No Information

CALCULATION OF THE RESULT - BRAZIL

No Information

LIVESTOCK ACTIVITY - BRAZIL

No Information

ASSETS OF RURAL ACTIVITY - BRAZIL

No Information

DEBTS RELATED TO RURAL ACTIVITY - BRAZIL

No Information

STATEMENT OF RURAL ACTIVITY - EXTERIOR

IDENTIFICATION DATA OF THE EXPLORED PROPERTY - EXTERIOR

No Information

INCOME AND EXPENSES - EXTERIOR

No Information

CALCULATION OF THE RESULT - EXTERIOR

No Information

LIVESTOCK ACTIVITY - EXTERIOR

No Information

ASSETS OF RURAL ACTIVITY - EXTERIOR

No Information

DEBTS RELATED TO RURAL ACTIVITY - EXTERIOR

No Information

STATEMENT OF CAPITAL GAINS CALCULATION

No Information

VARIABLE INCOME - COMMON OPERATIONS/DAY TRADE - TAXPAYER

NET GAINS OR LOSSES - JAN

No Information

NET GAINS OR LOSSES - FEB

No Information

NET GAINS OR LOSSES - MAR

No Information

NET GAINS OR LOSSES - APR

No Information

NET GAINS OR LOSSES - MAY

No Information

NET GAINS OR LOSSES - JUN

No Information

NET GAINS OR LOSSES - JUL

No Information

NET GAINS OR LOSSES - AUG

No Information

NET GAINS OR LOSSES - SEP

No Information

NET GAINS OR LOSSES - OCT

No Information

NET GAINS OR LOSSES - NOV

No Information

NET GAINS OR LOSSES - DEC

No Information

VARIABLE INCOME - COMMON OPERATIONS/DAY TRADE - DEPENDENTS

No Information

REAL ESTATE INVESTMENT FUNDS OR IN AGRO-INDUSTRIAL PRODUCTION CHAINS - TAXPAYER

No Information

REAL ESTATE INVESTMENT FUNDS OR IN AGRO-INDUSTRIAL PRODUCTION CHAINS - DEPENDENTS

No Information

DONATIONS DIRECTLY IN THE DECLARATION – ECA (STATUTE OF THE CHILD AND ADOLESCENT)

No Information

DONATIONS DIRECTLY IN THE DECLARATION - ELDERLY

No Information

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2024** **CALENDAR YEAR 2023**

SUMMARY — TAXATION USING THE LEGAL DEDUCTION

TAXABLE INCOME

Received from Legal Entity by the taxpayer	105.300,01
Received from Legal Entity by dependents	0,00
Received from Individual/Abroad by the taxpayer	0,00
Received from Individual/Abroad by Dependents	0,00
Received Cumulatively by the taxpayer	0,00
Received Cumulatively by dependents	0,00
Taxable Income from Rural Activity	0,00
TOTAL	105.300,01

DEDUCTIONS

Contributions to the official and closed complementary pension systems referred to in § 15 of Article 40 of the CF (Federal Constitution)/1988 (up to the sponsor limit)	9.319,19
Contribution to the official pension system (Income received cumulatively)	0,00
Contribution to the complementary pension system, including the amount for the closed systems referred to in Article 40, § 15, of the CF (Federal Constitution)/1988, which exceeds the sponsor's limit	0,00
Dependents	4.550,16
Education Expenses	7.123,00
Medical Expenses	0,00
Judicial Alimony	0,00
Alimony by Public Deed	0,00
Judicial Alimony (Income received cumulatively)	0,00
Cash Book	0,00
TOTAL	20.992,35

TAX DUE

Tax Base	84.307,66
Tax Due	12.627,47
Incentive Deduction	0,00
Tax Due I	12.627,47
Tax Due RRA (on received accumulated income)	0,00
Effective Tax Rate (%)	11,99
Total Tax Due	12.627,47

TAX PAID

Tax Withheld at Source by the Taxpayer	13.265,16
Tax Withheld at Source by Dependents	0,00
Taxpayer's Carnê-Leão	0,00
Dependents' Carnê-Leão	0,00
Complementary Tax	0,00
Tax Paid Abroad	0,00
Tax Withheld at Source (Law No. 11.033/2004)	0,00
Tax Withheld RRA	0,00
Total Tax Paid	13.265,16

TAX TO BE REFUNDED	637,69
BALANCE OF TAX PAYABLE	0,00

INSTALLMENT PLAN

Installment Amount	0,00
Number of Installments	0

BANKING INFORMATION

Account Type	Checking Account
Bank	341
Branch (without verification digit)	4054
Account for credit	2780 2

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2024** **CALENDAR YEAR 2023**

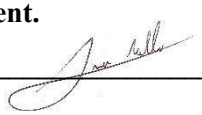
ASSET EVOLUTION

Assets and Rights on 12/31/2022	2.268.363,17
Assets and Rights on 12/31/2023	2.269.352,42
Encumbrances and Real Liabilities on 12/31/2022	1.261.710,31
Encumbrances and Real Liabilities on 12/31/2023	2.177.661,38

OTHER INFORMATION

Exempt and non-taxable income	270.157,17
Income subject to exclusive/definitive taxation	18,56
Taxable income - tax with suspended liability	0,00
Judicial Deposits of Tax	0,00
Tax Paid on Capital Gains	0,00
Tax Paid on Capital Gains Foreign Currency - Assets, Rights, and Financial Investments	0,00
Total tax withheld at source (Law No. 11.033/2004), as per the data provided by the taxpayer	0,00
Tax Paid on Variable Income	0,00
Donations to Political Parties and Candidates for Elective Office	0,00
Tax Payable on Capital Gain - Foreign Currency in Cash	0,00
Deferred Tax on Capital Gains	0,00
Tax Due on Capital Gains	0,00
Tax Due on Net Income from Variable Income	0,00
Tax Due on Capital Gains in Foreign Currency - Assets, Rights, and Financial Investments	0,00

I, André Vinícius Inacio Penna Mello, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 10, 2026

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2024** **ANO-CALENDÁRIO 2023**

IDENTIFICAÇÃO DO CONTRIBUINTE

Nome:	LUCIANO APARECIDO DE SOUZA	CPF:	286.551.298-36
Data de Nascimento:	15/08/1979	Título Eleitoral:	
Possui cônjuge ou companheiro(a)?	Sim	CPF do cônjuge ou companheiro(a):	166.602.168-71

Era residente no exterior e passou a ser residente no Brasil em 2023? Não

Houve alteração de dados cadastrais? Não

Um dos declarantes é pessoa com doença grave ou portadora de deficiência física ou mental? Não

Endereço:	RUA JOSE GONCALVES GALEAO	Número:	93
Complemento:	APTO 132	Bairro/Distrito:	JARDIM AVELINO
Município:	SÃO PAULO	UF:	SP
CEP:	03227-150	DDD/Telefone:	
E-mail:		DDD/Celular:	

Natureza da Ocupação: 01 - EMPREGADO DE EMPRESA DO SETOR PRIVADO, EXCETO DE INSTITUIÇÕES FINANCEIRAS

Ocupação Principal: 000 - OUTRAS OCUPAÇÕES NÃO ESPECIFICADAS ANTERIORMENTE

Tipo de declaração: Declaração Retificadora

Nº do recibo da declaração anterior do exercício de 2024: 25.96.21.68.53-44

PROTEGIDA POR SIGILO FISCAL

DEPENDENTES

CÓDIGO	NOME	DATA DE NASCIMENTO	CPF
21	EMILLY FIORITI SOUZA	15/09/2014	582.933.638-35
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			
21	ALANA FIORITI SOUZA	19/06/2016	582.886.808-01
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			

TOTAL DE DEDUÇÃO COM DEPENDENTES 4.550,16

ALIMENTANDOS

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELO TITULAR

(Valores em Reais)

NOME DA FONTE PAGADORA	REND. RECEBIDOS DE PES. JURÍDICA	CONTR. PREVID. OFICIAL	IMPOSTO RETIDO NA FONTE	13º SALÁRIO	IRRF SOBRE 13º SALÁRIO
E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	84.720,28	9.319,19	10.178,20	0,00	0,00
CNPJ/CPF: 12.349.468/0001-75					
CAIXA VIDA E PREVIDENCIA S/A	20.579,73	0,00	3.086,96	0,00	0,00
CNPJ/CPF: 03.730.204/0001-76					
TOTAL	105.300,01	9.319,19	13.265,16	0,00	0,00

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELOS DEPENDENTES

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA FÍSICA E DO EXTERIOR PELO TITULAR

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA FÍSICA E DO EXTERIOR PELOS DEPENDENTES

Sem Informações

RENDIMENTOS ISENTOS E NÃO TRIBUTÁVEIS

(Valores em Reais)

12. Rendimentos de cadernetas de poupança, letras hipotecárias, letras de crédito do agronegócio e imobiliário (LCA e LCI) e certificados de recebíveis do agronegócio e imobiliários (CRA e CRI) — 157,17

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	60.746.948/0001-12	BANCO BRADESCO S.A.	157,17

13. Rendimento de sócio ou titular de microempresa ou empresa de pequeno porte optante pelo Simples Nacional, exceto pro labore, aluguéis e serviços prestados — 270.000,00

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	12.349.468/0001-75	E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	270.000,00

TOTAL 270.157,17

RENDIMENTOS SUJEITOS À TRIBUTAÇÃO EXCLUSIVA / DEFINITIVA

(Valores em Reais)

06. Rendimentos de aplicações financeiras — 18,56

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	60.746.948/0001-12	BANCO BRADESCO S.A.	18,28
Titular	286.551.298-36	60.701.190/0001-04	ITAU UNIBANCO S.A.	0,28

TOTAL 18,56

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELO TITULAR (IMPOSTO COM EXIGIBILIDADE SUSPENSA)

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELOS DEPENDENTES (IMPOSTO COM EXIGIBILIDADE SUSPENSA)

Sem Informações

RENDIMENTOS TRIBUTÁVEIS DE PESSOA JURÍDICA RECEBIDOS ACUMULADAMENTE PELO TITULAR

Sem Informações

RENDIMENTOS TRIBUTÁVEIS DE PESSOA JURÍDICA RECEBIDOS ACUMULADAMENTE PELOS DEPENDENTES

Sem Informações

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2024** **ANO-CALENDÁRIO 2023**

IMPOSTO PAGO / RETIDO

(Valores em Reais)

01. Imposto complementar	0,00
02. Imposto pago no exterior pelo titular e pelos dependentes	0,00
Imposto devido com os rendimentos no exterior	0,00
Imposto devido sem os rendimentos no exterior	0,00
Diferença a ser considerada para cálculo do imposto (limite legal)	0,00
03. Imposto sobre a renda na fonte (Lei 11.033/2004)	0,00
04. Imposto retido na fonte do titular	13.265,16
05. Imposto retido na fonte dos dependentes	0,00
06. Carnê-Leão do titular	0,00
07. Carnê-Leão dos dependentes	0,00

PAGAMENTOS EFETUADOS

(Valores em Reais)

CÓD.	NOME DO BENEFICIÁRIO	CPF/CNPJ DO BENEFICIÁRIO	VALOR PAGO	PARC. NÃO DEDUTÍVEL
Dependente: EMILLY FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	47.358,30	0,00
Descrição:	COMPROVANTE PAGAMENTO ANO BASE 2022, NUMERO DA MATRICULA 116140887, VALOR DEDUTIVEL R$ 35.883,00			
Dependente: ALANA FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	45.415,50	0,00
Descrição:	COMPROVANTE DE PAGAMENTO ANO BASE. 2022, NUMERO MATRICULA 116140879, VALOR DEDUTIVEL R$ 34.156,80			

DOAÇÕES EFETUADAS

Sem Informações

DECLARAÇÃO DE BENS E DIREITOS

(Valores em Reais)

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2022	SITUAÇÃO EM 31/12/2023
01	11	AQUISICAO DE APTO NO 132C, SITUADO A RUA JOSE GONCALVES GALEAO, NO 93, JARDIM AVELINO, SAO PAULO, SP, PELO VALOR DE R$ 595.000, SENDO FINANCIADO EM 180 MESES O VALOR DE R$ 435.000 E R$ 165.000 PAGO A VISTA. ALIENARAM FIDUCIARIAMENTE AO BANCO ITAU PARA GARANTIA DA DIVIDA NO VALOR DE R$ 707.0000, A SER PAGA EM 180 PRESTACOES, DE R$ 10.159,01, SENDO A 1A EM 09/07/2023.	595.000,00	595.000,00

105 - BRASIL

Inscrição Municipal (IPTU):

Logradouro: RUA JOSE GONCALVES GALEAO Nº: 93
Comp.: AP 132 Bairro: JARDIM AVELINO
Município: SÃO PAULO UF: SP CEP:

PROTEGIDA POR SIGILO FISCAL

DECLARAÇÃO DE BENS E DIREITOS (Valores em Reais)

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2022	SITUAÇÃO EM 31/12/2023
		Área Total: 0,0 Data de Aquisição: 27/06/2023 Registrado no Cartório:		
02	01	HONDA CIVIC EXL AON 2009, MODELO 2010, PLACA EMG8503. 105 - BRASIL RENAVAM: 00000000000	17.232,00	17.232,00
03	02	630 QUOTAS A R$ 50,00 CADA, VALOR TOTAL R$ 31.500 DA EMPRESA E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 50,00, TOTAL R$ 10.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 1.520.000, CONFORME CONTRATO PARTICULAR DE 08/2021. 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 12.349.468/0001-75	1.561.500,00	1.561.500,00
03	02	630 QUOTAS A R$ 10,00 CADA, VALOR TOTAL R$ 6.300 DA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 10,00, TOTAL R$ 2.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 80.000, CONFORME CONTRATO PARTICULAR DE 08/2021. 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 31.412.442/0001-79	88.300,00	88.300,00
03	02	99% DAS QUOTAS SOCIAIS DA EMPRESA LUAP DATA INFORMATICA LTDA. 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 07.519.842/0001-01	5.940,00	5.940,00

PROTEGIDA POR SIGILO FISCAL

DECLARAÇÃO DE BENS E DIREITOS (Valores em Reais)

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2022	SITUAÇÃO EM 31/12/2023
04	99	CONTAS DE POUPANCA, AGENCIA 4054, CONTA POUPANCA 2780-2 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 60.701.190/0001-04	114,64	1.026,17
06	01	CONTA CORRENTE 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 60.701.190/0001-04 Banco: 341 Agência: 4054 Conta: 2780-2	5,00	10,00
06	01	CONTA CORRENTE, BANCO C6 S/A. 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 31.872.495/0001-72 Banco: 336 Agência: 0001 Conta: 7614102-0	271,53	344,25
TOTAL			2.268.363,17	2.269.352,42

DÍVIDAS E ÔNUS REAIS (Valores em Reais)

CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2022	SITUAÇÃO EM 31/12/2023	VALOR PAGO EM 2023
11	CREDITO IMOBILIARIO, BANCO ITAU, CONTRATO 10118394007, PARCELAS PAGAS R$ 41.588,70	86.710,31	692.318,49	79.043,18
13	DA EMPRESA E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 50,00, TOTAL R$ 10.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 1.520.000, CONFORME CONTRATO PARTICULAR DE 08/2021. EM 2021 PAGO R$ 118.750,00. EM 2022 PAGO R$ 285.000,00. EM 2023 PAGO R$ 318.917,89.	1.116.250,00	797.332,11	318.917,89

PROTEGIDA POR SIGILO FISCAL

13	DA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 10,00, TOTAL R$ 2.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 80.000, CONFORME CONTRATO PARTICULAR DE 08/2021. PAGO EM 2021 R$ 6.250. PAGO EM 2022 R$ 15.000. PAGO EM 2023 R$ 16.785,16.	58.750,00	41.964,84	16.785,16
11	AQUISICAO DE APTO NO 132C, SITUADO A RUA JOSE GONCALVES GALEAO, NO 93, JARDIM AVELINO, SAO PAULO, SP, PELO VALOR DE R$ 595.000, SENDO FINANCIADO EM 180 MESES O VALOR DE R$ 435.000 E R$ 165.000 PAGO A VISTA. ALIENARAM FIDUCIARIAMENTE AO BANCO ITAU PARA GARANTIA DA DIVIDA NO VALOR DE R$ 707.0000, A SER PAGA EM 180 PRESTACOES, DE R$ 10.159,01, SENDO A 1A EM 09/07/2023. PAGO EM 2023	0,00	646.045,94	60.954,06
TOTAL		1.261.710,31	2.177.661,38	475.700,29

DOAÇÕES A PARTIDOS POLÍTICOS E CANDIDATOS A CARGOS ELETIVOS

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DEMONSTRATIVO DE ATIVIDADE RURAL - BRASIL

DADOS E IDENTIFICAÇÃO DO IMÓVEL EXPLORADO - BRASIL

Sem Informações

RECEITAS E DESPESAS - BRASIL

Sem Informações

APURAÇÃO DO RESULTADO - BRASIL

Sem Informações

MOVIMENTAÇÃO DO REBANHO - BRASIL

Sem Informações

BENS DA ATIVIDADE RURAL - BRASIL

Sem Informações

DÍVIDAS VINCULADAS À ATIVIDADE RURAL - BRASIL

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DEMONSTRATIVO DE ATIVIDADE RURAL - EXTERIOR

DADOS E IDENTIFICAÇÃO DO IMÓVEL EXPLORADO - EXTERIOR

Sem Informações

RECEITAS E DESPESAS - EXTERIOR

Sem Informações

APURAÇÃO DO RESULTADO - EXTERIOR

Sem Informações

MOVIMENTAÇÃO DO REBANHO - EXTERIOR

Sem Informações

BENS DA ATIVIDADE RURAL - EXTERIOR

Sem Informações

DÍVIDAS VINCULADAS À ATIVIDADE RURAL - EXTERIOR

Sem Informações

DEMONSTRATIVO DA APURAÇÃO DOS GANHOS DE CAPITAL

Sem Informações

PROTEGIDA POR SIGILO FISCAL

RENDA VARIÁVEL - OPERAÇÕES COMUNS/DAYTRADE - TITULAR

GANHOS LÍQUIDOS OU PERDAS - JAN

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - FEV

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - MAR

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - ABR

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - MAI

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - JUN

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - JUL

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - AGO

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - SET

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - OUT

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - NOV

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - DEZ

Sem Informações

RENDA VARIÁVEL - OPERAÇÕES COMUNS/DAYTRADE - DEPENDENTES

Sem Informações

FUNDOS DE INVESTIMENTO IMOBILIÁRIO OU NAS CADEIAS PRODUTIVAS AGROINDUSTRIAIS - TITULAR

Sem Informações

FUNDOS DE INVESTIMENTO IMOBILIÁRIO OU NAS CADEIAS PRODUTIVAS AGROINDUSTRIAIS - DEPENDENTES

Sem Informações

DOAÇÕES DIRETAMENTE NA DECLARAÇÃO - ECA

Sem Informações

DOAÇÕES DIRETAMENTE NA DECLARAÇÃO - IDOSO

Sem Informações

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2024** **ANO-CALENDÁRIO 2023**

RESUMO — TRIBUTAÇÃO UTILIZANDO AS DEDUÇÕES LEGAIS

RENDIMENTOS TRIBUTÁVEIS

Recebidos de Pessoa Jurídica pelo titular	105.300,01
Recebidos de Pessoa Jurídica pelos dependentes	0,00
Recebidos de Pessoa Física/Exterior pelo titular	0,00
Recebidos de Pessoa Física/Exterior pelos dependentes	0,00
Recebidos acumuladamente pelo titular	0,00
Recebidos acumuladamente pelos dependentes	0,00
Resultado tributável da Atividade Rural	0,00
TOTAL	105.300,01

DEDUÇÕES

Contribuições às previdências oficial e complementar fechada de que trata o § 15 do art. 40 da CF/1988 (até o limite do patrocinador)	9.319,19
Contribuição à previdência oficial (Rendimentos recebidos acumuladamente)	0,00
Contribuição à prev. complementar, inclusive o valor para as fechadas de que trata o § 15 do art. 40 da CF/1988 que exceder o limite do patrocinador	0,00
Dependentes	4.550,16
Despesas com instrução	7.123,00
Despesas médicas	0,00
Pensão alimentícia judicial	0,00
Pensão alimentícia por escritura pública	0,00
Pensão alimentícia judicial (Rendimentos recebidos acumuladamente)	0,00
Livro caixa	0,00
TOTAL	20.992,35

IMPOSTO DEVIDO

Base de cálculo do imposto	84.307,66
Imposto devido	12.627,47
Dedução de incentivo	0,00
Imposto devido I	12.627,47
Imposto devido RRA	0,00
Aliquota efetiva (%)	11,99
Total do imposto devido	12.627,47

IMPOSTO PAGO

Imposto retido na fonte do titular	13.265,16
Imp. retido na fonte dos dependentes	0,00
Carnê-Leão do titular	0,00
Carnê-Leão dos dependentes	0,00
Imposto complementar	0,00
Imposto pago no exterior	0,00
Imposto retido na fonte (Lei nº 11.033/2004)	0,00
Imposto retido RRA	0,00
Total do imposto pago	13.265,16

IMPOSTO A RESTITUIR	637,69
SALDO DE IMPOSTO A PAGAR	0,00

PARCELAMENTO

Valor da quota	0,00
Número de Quotas	0

INFORMAÇÕES BANCÁRIAS

Tipo de Conta	Conta Corrente
Banco	341
Agência (sem DV)	4054
Conta para crédito	2780 2

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2024** **ANO-CALENDÁRIO 2023**

EVOLUÇÃO PATRIMONIAL

Bens e direitos em 31/12/2022	2.268.363,17
Bens e direitos em 31/12/2023	2.269.352,42
Dívidas e ônus reais em 31/12/2022	1.261.710,31
Dívidas e ônus reais em 31/12/2023	2.177.661,38

OUTRAS INFORMAÇÕES

Rendimentos isentos e não tributáveis	270.157,17
Rendimentos sujeitos à tributação exclusiva/definitiva	18,56
Rendimentos tributáveis - imposto com exigibilidade suspensa	0,00
Depósitos judiciais do imposto	0,00
Imposto pago sobre Ganhos de Capital	0,00
Imposto pago Ganhos de Capital Moeda Estrangeira - Bens, direitos e Aplicações Financeiras	0,00
Total do imposto retido na fonte (Lei nº11.033/2004), conforme dados informados pelo contribuinte	0,00
Imposto pago sobre Renda Variável	0,00
Doações a Partidos Políticos e Candidatos a Cargos Eletivos	0,00
Imposto a pagar sobre o Ganho de Capital - Moeda Estrangeira em Espécie	0,00
Imposto diferido dos Ganhos de Capital	0,00
Imposto devido sobre Ganhos de Capital	0,00
Imposto devido sobre ganhos líquidos em Renda Variável	0,00
Imposto devido sobre Ganhos de Capital Moeda Estrangeira - Bens, direitos e aplic. financeiras	0,00

PROTEGIDA POR SIGILO FISCAL

MINISTRY OF FINANCE **INCOME TAX - INDIVIDUAL**

SPECIAL SECRETARIAT OF THE FEDERAL REVENUE OF BRAZIL TAX YEAR 2024 CALENDAR YEAR 2023

RECEIPT FOR THE SUBMISSION OF THE ANNUAL ADJUSTMENT DECLARATION - OPTION FOR LEGAL DEDUCTIONS

AMENDED DECLARATION No. 3

TAXPAYER IDENTIFICATION

CPF of the taxpayer	Name of the taxpayer	Telephone
286.551.298-36	LUCIANO APARECIDO DE SOUZA	

Address	Number	Unit
RUA JOSE GONCALVES GALEAO	93	APT. 132

Neighborhood/District	ZIP Code	City	State
JARDIM AVELINO	03227-150	SAO PAULO	SP

(Values in Reais)

TOTAL TAXABLE INCOME	105.300,01
TAX DUE	12.627,47
TAX TO BE REFUNDED	637,69
BALANCE OF TAX PAYABLE	0,00
TAX PAYABLE CAPITAL GAIN – CURRENCY IN CASH	0,00
REFUND BANK CODE	341
BRANCH	4054
ACCOUNT FOR CREDIT	2780-2

Declaration received via Internet JV
by the Receiving Agent SERPRO
(Federal Data Processing Service)
on 10/09/2025 at 09:30:06 am
2589869246

MINISTRY OF FINANCE **INCOME TAX - INDIVIDUAL**

SPECIAL SECRETARIAT OF THE FEDERAL REVENUE OF BRAZIL TAX YEAR 2024 CALENDAR YEAR 2023

Mr. LUCIANO APARECIDO DE SOUZA, registered under the CPF No 286.551.298-36.

THE RECEIPT NUMBER for your declaration submitted on 10/09/2023, at 09:30:06 am, is:

12.11.66.28.54 -71

This number is for personal use and SHOULD NOT be provided to third parties. It is mandatory for:

- rectifying this declaration;
- generating an access code for obtaining information and performing services available on the website of the Special Secretariat of the Federal Revenue of Brazil such as:
  - My Income Tax (DIRPF – Individual Tax Return - Statement):
    - information on the processing status;
    - presentation of any pending issues and guidance on how to resolve them;
    - modification or cancellation of automatic installment payments;
    - Display of overdue tax installments and issuance of updated Documents for Federal Revenue Collection (Darf).
  - Tax Status:
    - Information on any pending issues, including those related to the Federal Government's Active Debt, and guidance on how to regularize them.

Attention: Keep this number to provide it in the 2025 tax return, in the field "previous year's declaration receipt number ".

Information on the Darf Printing

The Annual Adjustment Statement Program for Individual Income Tax allows the printing of the Darf for the payment of all installments, including those overdue. The Darf will be printed with interest equivalent to the reference rate of the Special System for Settlement and Custody (Selic) for federal securities, accumulated monthly, calculated from 06/03/2024 until the month prior to payment, and 1% in the month of payment.

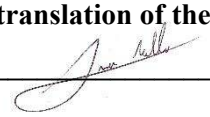
If the installment payment is made after its due date, a late payment penalty of 0.33% per day will apply, with a maximum limit of 20%.

For printing the Darf, the taxpayer should use the option **Declaration** / **Print** / **Darf of the IRPF** and select the installment for printing.

In the case of installments resulting from amended declarations that lead to a change in tax payable, for printing the DARF, access the e-CAC Portal on the RFB (Brazilian Federal Revenue) website at (http://gov.br/receitafederal). Then, click on **"Declarations and Statements"**, select the service **"My Income Tax (DIRPF Statement Extract)"**. In the list of services found, click on "**Payment** - **Check Debts, Issue DARF**, and **Change Installments**". After viewing the quantity of installments and the status of each one, click on the "**Print**" icon to generate the DARF for the desired month.

Follow the processing of your declaration on the e-CAC or on your mobile device.

I, André Vinícius Inacio Penna Mello, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 16, 2026.

MINISTÉRIO DA FAZENDA	IMPOSTO SOBRE A RENDA - PESSOA FÍSICA
SECRETARIA ESPECIAL DA RECEITA FEDERAL DO BRASIL	EXERCÍCIO 2024 ANO-CALENDÁRIO 2023

RECIBO DE ENTREGA DA DECLARAÇÃO DE AJUSTE ANUAL - OPÇÃO PELAS DEDUÇÕES LEGAIS

DECLARAÇÃO RETIFICADORA Nº 3

IDENTIFICAÇÃO DO DECLARANTE

CPF do declarante	Nome do declarante	Telefone
286.551.298-36	LUCIANO APARECIDO DE SOUZA	

Endereço	Número	Complemento
RUA JOSE GONCALVES GALEAO	93	APTO 132

Bairro/Distrito	CEP	Município	UF
JARDIM AVELINO	03227-150	SAO PAULO	SP

(Valores em Reais)

TOTAL RENDIMENTOS TRIBUTÁVEIS	105.300,01
IMPOSTO DEVIDO	12.627,47
IMPOSTO A RESTITUIR	637,69
SALDO DO IMPOSTO A PAGAR	0,00
IMPOSTO A PAGAR GANHO DE CAPITAL - MOEDA EM ESPÉCIE	0,00

RESTITUIÇÃO CÓDIGO DO BANCO	341
AGÊNCIA BANCÁRIA	4054
CONTA PARA CRÉDITO	2780-2

Declaração recebida via Internet JV
pelo Agente Receptor SERPRO
em 09/10/2025 às 09:30:06
2589869246

MINISTÉRIO DA FAZENDA **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**

SECRETARIA ESPECIAL DA RECEITA FEDERAL DO BRASIL **EXERCÍCIO 2024** **ANO-CALENDÁRIO 2023**

Sr(a) LUCIANO APARECIDO DE SOUZA, inscrito no CPF sob o nº 286.551.298-36.

O NÚMERO DO RECIBO de sua declaração apresentada em 09/10/2025, às 09:30:06, é:

12.11.66.28.54 - 71

Este número é de uso pessoal e NÃO deve ser fornecido a terceiros. Ele é obrigatório para:

- retificar esta declaração;
- gerar um código de acesso para obter informações e realizar serviços disponíveis na página da Secretaria Especial da Receita Federal do Brasil na Internet, tais como:
  - Meu Imposto de Renda (Extrato da DIRPF):
    - informação da situação do processamento;
    - apresentação de eventuais pendências e orientações sobre como resolvê-las;
    - alteração ou cancelamento de débito automático das quotas;
    - exibição de quotas do imposto em atraso e emissões dos Documentos de Arrecadação de Receitas Federais (Darf) atualizados.
  - Situação Fiscal:
    - Informação de eventuais pendências, inclusive as relativas à Dívida Ativa da União, e orientação sobre como regularizá-las.

Atenção: Guarde este número para informá-lo na declaração do exercício de 2025, no campo "número do recibo da declaração do ano anterior".

Informações sobre a Impressão do Darf

O programa da Declaração de Ajuste Anual do Imposto sobre a Renda da Pessoa Física permite a impressão do Darf para pagamento de todas as quotas, inclusive as em atraso. O Darf será impresso acrescido de juros equivalentes à taxa referencial do Sistema Especial de Liquidação e Custódia (Selic), para títulos federais, acumulada mensalmente, calculados a partir de 03/06/2024 até o mês anterior ao do pagamento e de 1% no mês do pagamento.

Se o pagamento da quota for efetuado após o seu vencimento, incidirá multa de mora de 0,33% ao dia, observado o limite máximo de 20%.

Para impressão do Darf o contribuinte deve utilizar a opção **Declaração** / **Imprimir** / **Darf do IRPF** e selecionar a quota para impressão.

No caso de quotas decorrentes de declarações retificadoras em que ocorra mudança de imposto a pagar, para impressão do DARF acesse o Portal e-CAC no site da Receita Federal na Internet (https://www.gov.br/receitafederal/pt-br). Em seguida, clique em "**Declarações e Demonstrativos**", selecione o serviço "**Meu Imposto de Renda (Extrato da DIRPF)**". Na lista dos Serviços encontrados, clique em "**Pagamento - Consultar Débitos, Emitir DARF e Alterar Quotas**". Após visualizar o quantitativo de quotas e a situação de cada uma delas, clique no ícone "**Impressão**" para emitir o DARF do mês desejado.

Acompanhe o processamento da sua declaração no e-CAC ou no seu dispositivo móvel.

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2025** **CALENDAR YEAR 2024**

TAXPAYER IDENTIFICATION

Name:	LUCIANO APARECIDO DE SOUZA	CPF:	286.551.298-36
Date of Birth:	08/15/1979		
Do you have a spouse or partner?	Yes	CPF of the spouse or partner:	166.602.168-71

Were you a resident abroad and became a resident in Brazil in 2024? No

Were there any changes to the registration details? No

Is one of the declarants a person with a serious illness or a physical or mental disability? No

Address:	RUA JOSE GONCALVES GALEAO	Number:	93
Unit:	APT. 202, TOWER A	Neighborhood/District:	JARDIM AVELINO
City:	SÃO PAULO	State:	SP
ZIP Code:	03227-150	Area Code/Telephone:	
E-mail:		Area Code/Mobile:	

Occupation Type: 01 - EMPLOYEE OF A PRIVATE SECTOR COMPANY, EXCEPT FINANCIAL INSTITUTIONS
Main Occupation: 000 - OTHER OCCUPATIONS NOT PREVIOUSLY SPECIFIED
Type of Declaration: Amended Declaration
Receipt Number of the last declaration filed in the 2025 tax year: 40.19.71.27.41-07

DEPENDENTS

CODE	NAME	DATE OF BIRTH	CPF
21	EMILLY FIORITI SOUZA	09/15/2014	582.933.638-35
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			
21	ALANA FIORITI SOUZA	06/19/2016	582.886.808-01
Email :		Mobile :	
Does the dependent live with the taxpayer? Yes			

TOTAL DEDUCTION WITH DEPENDENTS 4.550,16

ALIMONY RECIPIENTS

No Information

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE TAXPAYER

(Values in Reais)

NAME OF THE PAYING SOURCE	INCOME RECEIVED FROM LEGAL ENTITY	OFFICIAL SOCIAL SECURITY CONTRIBUTION	WITHHELD TAX	13th SALARY	INCOME TAX WITHHELD ON 13th SALARY
E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA CNPJ/CPF: 12.349.468/0001-75	93.153,71	10.246,88	12.058,43	0,00	0,00
TOTAL	93.153,71	10.246,88	12.058,43	0,00	0,00

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY DEPENDENTS

No Information

TAXABLE INCOME RECEIVED FROM INDIVIDUALS AND ABROAD BY THE TAXPAYER

No Information

TAXABLE INCOME RECEIVED FROM INDIVIDUALS AND ABROAD BY DEPENDENTS

No Information

EXEMPT AND NON-TAXABLE INCOME

(Values in Reais)

12. Income from savings accounts, mortgage bonds, agribusiness, and real estate letters of credit (LCA and LCI), and certificates of agribusiness and real estate receivables (CRA and CRI) — 10,25

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	60.701.190/0001-04	ITAU UNIBANCO S.A.	10,25

13. 13. Income of a partner or owner of a microenterprise or small business opting for the Simples Nacional, except for pro labore, rents, and services rendered — 1.400.000,00

Beneficiary	CPF	CNPJ of the Paying Source	Name of the Paying Source	Amount
Taxpayer	286.551.298-36	12.349.468/0001-75	E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	1.400.000,00

99. Others — 102,16

Beneficiary	CPF	CPF/CNPJ of the Paying Source	Name of the Paying Source	Description	Amount
Taxpayer	286.551.298-36	11.214.907/0001-70	SAO PAULO STATE GOVERNMENT	NOTA FISCAL PAULISTA (Tax Incentive Program)	102,16

TOTAL 1.400.112,41

INCOME SUBJECT TO EXCLUSIVE/DEFINITIVE TAXATION

(Values in Reais)

TOTAL 0,00

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE TAXPAYER (TAX WITH SUSPENDED EXIGIBILITY)

No Information

TAXABLE INCOME RECEIVED FROM LEGAL ENTITY BY THE DEPENDENTS (TAX WITH SUSPENDED EXIGIBILITY)

No Information

TAXABLE INCOME FROM LEGAL ENTITY RECEIVED CUMULATIVELY BY THE TAXPAYER

No Information

TAXABLE INCOME FROM LEGAL ENTITY RECEIVED CUMULATIVELY BY THE DEPENDENTS

No Information

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2025** **CALENDAR YEAR 2024**

TAX PAID / WITHHELD

(Values in Reais)

01. Complementary Tax	0,00
02. Tax paid abroad by the taxpayer and dependents	0,00
Tax due with income abroad	0,00
Tax due without income abroad	0,00
Difference to be considered for tax calculation (legal limit)	0,00
03. Income Tax Withheld at Source (Law 11.033/2004):	0,00
04. Income Tax Withheld at Source for the Taxpayer	12.058,43
05. Income Tax Withheld at Source for the Dependents	0,00
06. Taxpayer's Carnê-Leão*	0,00
07. Dependent's Carnê-Leão	0,00

CARNÊ-LEÃO - (Income tax that must be paid monthly, mandatorily, by individuals residing in Brazil who receive income from another individual or from abroad)

PAYMENTS MADE

(Values in Reais)

CODE	BENEFICIARY NAME	BENEFICIARY CPF/CNPJ	AMOUNT PAID	NON-DEDUCTIBLE PORTION
Dependent: EMILLY FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	54.224,00	0,00
Description:				
Dependent: ALANA FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	52.024,40	0,00
Description:				

DONATIONS MADE

No Information

STATEMENTS OF ASSETS AND RIGHTS

(Values in Reais)

Did you update the value of any real estate property and pay the capital gain tax by 12/16/2024 in accordance with Law No. 14.973/2024?	No

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2023	STATUS ON 12/31/2024
01	11	ACQUIRED APARTMENT UNIT NO 202, 20th FLOOR, TOWER A - FIGUEIRA TOWER, TARUMA CONDOMINIUM, WITH THE RIGHT TO 3(THREE) UNDESIGNATED PARKING SPACES, UNDER THE, FOLLOWING PAYMENT TERMS: R$ 50.000 IN CASH, R$ 871.914 THROUGH DEED OF DATION IN PAYMENT OF APARTMENT 132, TOWER C AND REMAINING BALANCE OF R$ 630.000 FINANCED THROUGH BANCO ITAU.	1.551.914,00	1.551.914,00

105 - BRAZIL

Municipal Registration (IPTU): 05131503965

Address: RUA JOSE GONCALVES GALEAO No.: 93
Unit: NO 202, 20th FLOOR, TOWER A – FIGU TOWER Bairro: VILA PRUDENTE
City: SÃO PAULO State: SP ZIP Code: 03227-150
Total Area: 0.0 m² Acquisition Date: 06/12/2023
Registered at the Notary Office: Yes

STATEMENTS OF ASSETS AND RIGHTS (Values in Reais)

Did you update the value of any real estate property and pay the capital gain tax by 12/16/2024 in accordance with Law No. 14.973/2024?	No

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2023	STATUS ON 12/31/2024
Registration: 184495		Name of the Registry Office: 6th REAL ESTATE REGISTRY OFFICE OF SAO PAULO		
03	02	630 SHARES AT R$ 50,00 EACH, TOTAL VALUE R$ 31.500 OF THE COMPANY E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 50,00 EACH, TOTAL R$ 10.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 1.520.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. AS OF 11/21/2023, PURSUANT TO THE AMENDMENT TO THE ARTICLES OF ASSOCIATION, THE SHARES ARE HEREBY UPDATED TO 10.830, EACH SHARE VALUED AT R$ 50,,00, WITH A TOTAL EQUITY PARTICIPATION VALUE OF R$ 541.500,00.	541.500,00	541.500,00
105 - BRAZIL				
Asset or right belonging to: Taxpayer		CPF: 286.551.298-36		
CNPJ: 12.349.468/0001-75				
03	02	630 SHARES AT R$ 10,00 EACH, TOTAL VALUE R$ 6.300 OF THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMÁTICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 10,00 EACH, TOTAL R$ 2.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 80.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021.	8.300,00	8.300,00
105 - BRAZIL				
Asset or right belonging to: Taxpayer		CPF: 286.551.298-36		
CNPJ: 31.412.442/0001-79				
04	99	SAVINGS ACCOUNT, BRANCH 4054, SAVINGS ACCOUNT 2780-2	1.026,17	99,98
105 - BRAZIL				
Asset or right belonging to: Taxpayer		CPF: 286.551.298-36		
CNPJ: 60.701.190/0001-04				
06	01	CHECKING ACCOUNT, BANCO ITAU	10,00	10,00
105 - BRAZIL				
Asset or right belonging to: Taxpayer		CPF: 286.551.298-36		
CNPJ: 60.701.190/0001-04				
Bank: 341 Branch: 4054 Account: 2780-2		Payment Account? No		

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2025** **CALENDAR YEAR 2024**

STATEMENTS OF ASSETS AND RIGHTS

(Values in Reais)

Did you update the value of any real estate property and pay the capital gain tax by 12/16/2024 in accordance with Law No. 14.973/2024?	No

GROUP	CODE	DISCLOSURE	STATUS ON 12/31/2023	STATUS ON 12/31/2024
06	01	CHECKING ACCOUNT, BANCO C6 S/A.	344,25	66,30
105 - BRAZIL				
Asset or right belonging to: Taxpayer CPF: 286.551.298-36				
CNPJ: 31.872.495/0001-72				
Bank: 336 Branch: 0001 Account: 7614102-0 Payment Account? No				
TOTAL			2.103.094,42	2.101.890,28

ENCUMBRANCES AND REAL LIABILITIES

(Values in Reais)

CODE	DISCLOSURE	STATUS ON 12/31/2023	STATUS ON 12/31/2024	AMOUNT PAID IN 2024
11	REAL ESTATE CREDIT, BANCO ITAU, CONTRACT 10118394007, FINANCED AMOUNT OF R$ 630.000,00 . INSTALLMENTS PAID IN 2023 R$ 41.588,70 PERTAINING TO TO THE ACQUISITION OF APARTMENT UNIT NO 202, 20TH FLOWER, TOWER A – FIGUEIRA TOWER, TARUMA CONDOMINIUM, WITH THE RIGHT TO 3(THREE) UNDESIGNATED PARKING SPACES. PAID IN 2024: R$ 119.213,08.	692.318,49	650.232,05	119.213,08
13	FROM THE COMPANY E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 50,00 EACH, TOTAL R$ 10.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 1.520.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. IN 2021 PAID R$ 118.750,00. IN 2022 PAID R$ 285.000,00. IN 2023 PAID R$ 318.917,89. IN 2024 PAID R$ 502.143,31.	797.332,11	295.188,80	502.143,31
13	FROM THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. ACQUIRED FROM ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 ON 09/13/2021, 200 SHARES ACQUIRED AT R$ 10,00 EACH, TOTAL R$ 2.000. PREMIUM PAID ON THE SHARES IN THE AMOUNT OF R$ 80.000, PURSUANT TO PRIVATE AGREEMENT OF 08/2021. IN 2021 PAID R$ 6.250. IN 2022 PAID R$ 15.000. IN 2023 PAID R$ 16.785,16. PAID IN 2024 R$ 26.428,60.	41.964,84	15.536,24	26.428,60
16	AMOUNT ADVANCED BY THE COMPANY E-IT TECHNOLOGIES, CNPJ NO 12.349.468/0001-75, BALANCE AS OF 12/31/2023. AMOUNT PAID IN2024 R$ 1.267.144,55.	4.367.341,54	3.100.196,99	1.267.144,55
16	AMOUNT ADVANCED BY THE COMPANY E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA, CNPJ NO 31.412.442/0001-79, , BALANCE AS OF 12/31/2023.	79.824,37	79.824,37	0,00

14	PURSUANT TO THE PRIVATE INSTRUMENT OF PARTICIPATION IN THE PURCHASE AND SALE OF CORPORATE SHARES ENTERED INTO ON 03/25/2024 WITH THE COMPANY E-IT TECHNOLOGIES, THE BUYER LUCIANO APARECIDO DE SOUZA, CPF NO. 286.551.298/36, IS REQUIRED TO PAY THE SELLER SERGIO A S NORONHA UNDER THE FOLLOWING TERMS: 24 INSTALLMENTS OF R$ 23.750,00 STARTING ON 04/25/2024, 1 INTERIM INSTALLMENT OF R$ 46.000,00 DUE IN THE 12TH MONTH, AND 1 FINAL INSTALLMENT OF R$ 46.750,00 IN THE 25TH MONTH. FROM THE 13TH MONTH ONWARD, INSTALLMENTS ARE ADJUSTED BY THE IPCA INDEX. TOTAL AMOUNT: R$ 662.750,00. AMOUNT PAID IN 2024 R$ 237.500.	0,00	425.250,00	237.500,00
14	PURSUANT TO THE PRIVATE INSTRUMENT OF PARTICIPATION IN THE PURCHASE AND SALE OF CORPORATE SHARES ENTERED INTO ON 03/25/2024 WITH THE COMPANY E-IT SERVICES, THE BUYER LUCIANO APARECIDO DE SOUZA, CPF NO. 286.551.298/36, IS REQUIRED TO PAY THE SELLER SERGIO A S NORONHA UNDER THE FOLLOWING TERMS: 24 INSTALLMENTS OF R$ 1.250,00, 1 INTERIM INSTALLMENT R$3.000 DUE IN THE 12TH MONTH, AND 1 FINAL INSTALLMENT OF R$ 2.845,55 DUE IN THE 25TH MONTH. TOTAL AMOUNT: R$ 35.845,55. AMOUNT PAID IN 2024 R$ 12.500,00.	0,00	23.345,55	12.500,00
TOTAL		5.978.781,35	4.589.574,00	2.164.929,54

DONATIONS TO POLITICAL PARTIES AND CANDIDATES FOR ELECTIVE OFFICES

No Information

STATEMENT OF RURAL ACTIVITY - BRAZIL

IDENTIFICATION DATA OF THE EXPLORED PROPERTY - BRAZIL

No Information

INCOME AND EXPENSES - BRAZIL

No Information

CALCULATION OF THE RESULT - BRAZIL

No Information

LIVESTOCK ACTIVITY - BRAZIL

No Information

ASSETS OF RURAL ACTIVITY - BRAZIL

No Information

DEBTS RELATED TO RURAL ACTIVITY - BRAZIL

No Information

STATEMENT OF RURAL ACTIVITY - ABROAD

IDENTIFICATION DATA OF THE EXPLORED PROPERTY - ABROAD

No Information

INCOME AND EXPENSES - ABROAD

No Information

CALCULATION OF THE RESULT - ABROAD

No Information

LIVESTOCK ACTIVITY - ABROAD

No Information

ASSETS OF RURAL ACTIVITY - ABROAD

No Information

DEBTS RELATED TO RURAL ACTIVITY - ABROAD

No Information

STATEMENT OF CAPITAL GAINS CALCULATION

No Information

VARIABLE INCOME - COMMON OPERATIONS/DAY TRADE - TAXPAYER

NET GAINS OR LOSSES - JAN

No Information

NET GAINS OR LOSSES - FEB

No Information

NET GAINS OR LOSSES - MAR

No Information

NET GAINS OR LOSSES - APR

No Information

NET GAINS OR LOSSES - MAY

No Information

NET GAINS OR LOSSES - JUN

No Information

NET GAINS OR LOSSES - JUL

No Information

NET GAINS OR LOSSES - AUG

No Information

NET GAINS OR LOSSES - SEP

No Information

NET GAINS OR LOSSES - OCT

No Information

NET GAINS OR LOSSES - NOV

No Information

NET GAINS OR LOSSES - DEC

No Information

VARIABLE INCOME - COMMON OPERATIONS/DAY TRADE - DEPENDENTS

No Information

REAL ESTATE INVESTMENT FUNDS OR IN AGRO-INDUSTRIAL PRODUCTION CHAINS - TAXPAYER

No Information

REAL ESTATE INVESTMENT FUNDS OR IN AGRO-INDUSTRIAL PRODUCTION CHAINS - DEPENDENTS

No Information

DONATIONS DIRECTLY IN THE DECLARATION – ECA (STATUTE OF THE CHILD AND ADOLESCENT)

No Information

DONATIONS DIRECTLY IN THE DECLARATION - ELDERLY

No Information

NAME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **INCOME TAX - INDIVIDUAL**
ANNUAL ADJUSTMENT DECLARATION **TAX YEAR 2025** **CALENDAR YEAR 2024**

SUMMARY — TAXATION USING THE LEGAL DEDUCTION

TAXABLE INCOME

Received from Legal Entity by the taxpayer	93.153,71
Received from Legal Entity by dependents	0,00
Received from Individual/Abroad by the taxpayer	0,00
Received from Individual/Abroad by Dependents	0,00
Received Cumulatively by the taxpayer	0,00
Received Cumulatively by dependents	0,00
Taxable Income from Rural Activity	0,00
TOTAL	93.153,71

DEDUCTIONS

Contributions to the official and closed complementary pension systems referred to in § 15 of Article 40 of the CF (Federal Constitution)/1988 (up to the sponsor limit)	10.246,88
Contribution to the official pension system (Income received cumulatively)	0,00
Contribution to the complementary pension system, including the amount for the closed systems referred to in Article 40, § 15, of the CF (Federal Constitution)/1988, which exceeds the sponsor's limit	0,00
Dependents	4.550,16
Education Expenses	7.123,00
Medical Expenses	0,00
Judicial Alimony	0,00
Alimony by Public Deed	0,00
Judicial Alimony (Income received cumulatively)	0,00
Cash Book	0,00
TOTAL	21.920,04

TAX DUE

Tax Base	71.233,67
Tax Due	8.848,27
Incentive Deduction	0,00
Tax Due I	8.848,27
Tax Due RRA (on received accumulated income)	0,00
Effective Tax Rate (%)	9,49
Total Tax Due	8.848,27

TAX TO BE REFUNDED	3.210,16
BALANCE OF TAX PAYABLE	0,00

INSTALLMENT PLAN

Installment Amount	0,00
Number of Installments	0

TAX PAID

Tax Withheld at Source by the Taxpayer	12.058,43
Tax Withheld at Source by Dependents	0,00
Taxpayer's Carnê-Leão	0,00
Dependents' Carnê-Leão	0,00
Complementary Tax	0,00
Tax Paid Abroad	0,00
Tax Withheld at Source (Law No. 11.033/2004)	0,00
Tax Withheld RRA	0,00
Total Tax Paid	12.058,43

BANKING INFORMATION

Account Type	Checking Account
Bank	341
Branch (without verification digit)	4054
Account for credit	2780 2

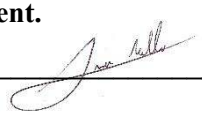
ASSET EVOLUTION

Assets and Rights on 12/31/2023	2.103.094,42
Assets and Rights on 12/31/2024	2.101.890,28
Encumbrances and Real Liabilities on 12/31/2023	5.978.781,35
Encumbrances and Real Liabilities on 12/31/2024	4.589.574,00

OTHER INFORMATION

Exempt and non-taxable income	1.400.112,41
Income subject to exclusive/definitive taxation	0,00
Taxable income - tax with suspended liability	0,00
Judicial Deposits of Tax	0,00
Tax Paid on Capital Gains	0,00
Tax Paid on Capital Gains Foreign Currency - Assets, Rights, and Financial Investments	0,00
Total tax withheld at source (Law No. 11.033/2004), as per the data provided by the taxpayer	0,00
Tax Paid on Variable Income	0,00
Donations to Political Parties and Candidates for Elective Office	0,00
Tax Payable on Capital Gain - Foreign Currency in Cash	0,00
Deferred Tax on Capital Gains	0,00
Tax Due on Capital Gains	0,00
Tax Due on Net Income from Variable Income	0,00
Tax Due on Capital Gains in Foreign Currency - Assets, Rights, and Financial Investments	0,00

I, André Vinícius Inacio Penna Mello, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 14, 2026

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2025** **ANO-CALENDÁRIO 2024**

IDENTIFICAÇÃO DO CONTRIBUINTE

Nome:	LUCIANO APARECIDO DE SOUZA	CPF:	286.551.298-36
Data de Nascimento:	15/08/1979		
Possui cônjuge ou companheiro(a)?	Sim	CPF do cônjuge ou companheiro(a):	166.602.168-71

Era residente no exterior e passou a ser residente no Brasil em 2024? Não

Houve alteração de dados cadastrais? Não

Um dos declarantes é pessoa com doença grave ou portadora de deficiência física ou mental? Não

Endereço:	RUA JOSE GONCALVES GALEAO	Número:	93
Complemento:	APTO 202, TORRE A	Bairro/Distrito:	JARDIM AVELINO
Município:	SÃO PAULO	UF:	SP
CEP:	03227-150	DDD/Telefone:	
E-mail:		DDD/Celular:	

Natureza da Ocupação: 01 - EMPREGADO DE EMPRESA DO SETOR PRIVADO, EXCETO DE INSTITUIÇÕES FINANCEIRAS

Ocupação Principal: 000 - OUTRAS OCUPAÇÕES NÃO ESPECIFICADAS ANTERIORMENTE

Tipo de declaração: Declaração Retificadora

Nº do recibo da declaração anterior do exercício de 2025: 40.19.71.27.41-07

PROTEGIDA POR SIGILO FISCAL

DEPENDENTES

CÓDIGO	NOME	DATA DE NASCIMENTO	CPF
21	EMILLY FIORITI SOUZA	15/09/2014	582.933.638-35
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			
21	ALANA FIORITI SOUZA	19/06/2016	582.886.808-01
Email :		Celular :	
Dependente mora com o titular da declaração? Sim			

TOTAL DE DEDUÇÃO COM DEPENDENTES 4.550,16

ALIMENTANDOS

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELO TITULAR

(Valores em Reais)

NOME DA FONTE PAGADORA	REND. RECEBIDOS DE PES. JURÍDICA	CONTR. PREVID. OFICIAL	IMPOSTO RETIDO NA FONTE	13º SALÁRIO	IRRF SOBRE 13º SALÁRIO
E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA CNPJ/CPF: 12.349.468/0001-75	93.153,71	10.246,88	12.058,43	0,00	0,00
TOTAL	93.153,71	10.246,88	12.058,43	0,00	0,00

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELOS DEPENDENTES

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA FÍSICA E DO EXTERIOR PELO TITULAR

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA FÍSICA E DO EXTERIOR PELOS DEPENDENTES

Sem Informações

RENDIMENTOS ISENTOS E NÃO TRIBUTÁVEIS

(Valores em Reais)

12. Rendimentos de cadernetas de poupança, letras hipotecárias, letras de crédito do agronegócio e imobiliário (LCA e LCI) e certificados de recebíveis do agronegócio e imobiliários (CRA e CRI) 10,25

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	60.701.190/0001-04	ITAU UNIBANCO S.A.	10,25

13. Rendimento de sócio ou titular de microempresa ou empresa de pequeno porte optante pelo Simples Nacional, exceto pro labore, aluguéis e serviços prestados 1.400.000,00

Beneficiário	CPF	CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Valor
Titular	286.551.298-36	12.349.468/0001-75	E-IT TECNOLOGIES CONSULTORIA DE INFORMATICA LTDA	1.400.000,00

99. Outros 102,16

Beneficiário	CPF	CPF/CNPJ da Fonte Pagadora	Nome da Fonte Pagadora	Descrição	Valor
Titular	286.551.298-36	11.214.907/0001-70	GOVERNO DO ESTADO DE SAO PAULO	NOTA FISCAL PAULISTA	102,16

TOTAL 1.400.112,41

RENDIMENTOS SUJEITOS À TRIBUTAÇÃO EXCLUSIVA / DEFINITIVA

(Valores em Reais)

TOTAL 0,00

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELO TITULAR (IMPOSTO COM EXIGIBILIDADE SUSPENSA)

Sem Informações

RENDIMENTOS TRIBUTÁVEIS RECEBIDOS DE PESSOA JURÍDICA PELOS DEPENDENTES (IMPOSTO COM EXIGIBILIDADE SUSPENSA)

Sem Informações

RENDIMENTOS TRIBUTÁVEIS DE PESSOA JURÍDICA RECEBIDOS ACUMULADAMENTE PELO TITULAR

Sem Informações

RENDIMENTOS TRIBUTÁVEIS DE PESSOA JURÍDICA RECEBIDOS ACUMULADAMENTE PELOS DEPENDENTES

Sem Informações

PROTEGIDA POR SIGILO FISCAL

IMPOSTO PAGO / RETIDO

(Valores em Reais)

01. Imposto complementar	0,00
02. Imposto pago no exterior pelo titular e pelos dependentes	0,00
Imposto devido com os rendimentos no exterior	0,00
Imposto devido sem os rendimentos no exterior	0,00
Diferença a ser considerada para cálculo do imposto (limite legal)	0,00
03. Imposto sobre a renda na fonte (Lei 11.033/2004)	0,00
04. Imposto retido na fonte do titular	12.058,43
05. Imposto retido na fonte dos dependentes	0,00
06. Carnê-Leão do titular	0,00
07. Carnê-Leão dos dependentes	0,00

PAGAMENTOS EFETUADOS

(Valores em Reais)

CÓD.	NOME DO BENEFICIÁRIO	CPF/CNPJ DO BENEFICIÁRIO	VALOR PAGO	PARC. NÃO DEDUTÍVEL
Dependente: EMILLY FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	54.224,00	0,00
Descrição:				
Dependente: ALANA FIORITI SOUZA				
01	COLEGIO SANTA AMALIA MAPLE BEAR - ENSINO BILINGUE AB	60.597.044/0041-60	52.024,40	0,00
Descrição:				

DOAÇÕES EFETUADAS

Sem Informações

DECLARAÇÃO DE BENS E DIREITOS

(Valores em Reais)

Atualizou o valor de algum bem imóvel e pagou o ganho de capital até 16/12/2024 de acordo com a Lei nº 14.973/2024?	Não

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2023	SITUAÇÃO EM 31/12/2024
01	11	AQUIRIDO APARTAMENTO TIPO NO 202, 20O ANDAR, TORRE A - TORRE FIGUEIRA, CONDOMINIO TARUMA, COM DIREITO A 3(TRES) VAGAS DE GARAGEM, LOCAIS INDETERMINADOS, SENDO PELA FORMA DE PAGAMENTO: R$ 50.000 EM MOEDA CORRENTE, R$ 871.914 ESCRITURA DE DACAO DE PAGAMENTO DO APARTAMENTO 132, TORRE C E O SALDO DE R$ 630.000 FINANCIADO PELO BANCO ITAU.	1.551.914,00	1.551.914,00

105 - BRASIL

Inscrição Municipal (IPTU): 05131503965

Logradouro: RUA JOSE GONCALVES GALEAO Nº: 93
Comp.: NO 202, 20O ANDAR, TORRE A - TORRE FIGU Bairro: VILA PRUDENTE
Município: SÃO PAULO UF: SP CEP: 03227-150
Área Total: 0,0 m² Data de Aquisição: 12/06/2023
Registrado no Cartório: Sim

PROTEGIDA POR SIGILO FISCAL

DECLARAÇÃO DE BENS E DIREITOS (Valores em Reais)

Atualizou o valor de algum bem imóvel e pagou o ganho de capital até 16/12/2024 de acordo com a Lei nº 14.973/2024?	Não

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2023	SITUAÇÃO EM 31/12/2024
Matrícula: 184495		Nome Cartório: 6O CARTORIO DE REGISTRO DE IMOVEIS DE SAO PAULO		
03	02	630 QUOTAS A R$ 50,00 CADA, VALOR TOTAL R$ 31.500 DA EMPRESA E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 50,00, TOTAL R$ 10.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 1.520.000, CONFORME CONTRATO PARTICULAR DE 08/2021. EM 21.11.2023, CONFORME ALTERACAO DE CONTRATO AS QUOTAS PASSAM A SER ATUALIZADAS PARA 10.830, CADA QUOTA A R$ 50,,00, COM VALOR DE PARTICIPACAO NA SOCIEDADE DE R$ 541.500,00.	541.500,00	541.500,00
105 - BRASIL				
Bem ou direito pertencente ao: Titular		CPF: 286.551.298-36		
CNPJ: 12.349.468/0001-75				
03	02	630 QUOTAS A R$ 10,00 CADA, VALOR TOTAL R$ 6.300 DA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 10,00, TOTAL R$ 2.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 80.000, CONFORME CONTRATO PARTICULAR DE 08/2021.	8.300,00	8.300,00
105 - BRASIL				
Bem ou direito pertencente ao: Titular		CPF: 286.551.298-36		
CNPJ: 31.412.442/0001-79				
04	99	CONTAS DE POUPANCA, AGENCIA 4054, CONTA POUPANCA 2780-2	1.026,17	99,98
105 - BRASIL				
Bem ou direito pertencente ao: Titular		CPF: 286.551.298-36		
CNPJ: 60.701.190/0001-04				
06	01	CONTA CORRENTE, BANCO ITAU	10,00	10,00
105 - BRASIL				
Bem ou direito pertencente ao: Titular		CPF: 286.551.298-36		
CNPJ: 60.701.190/0001-04				
Banco: 341 Agência: 4054 Conta: 2780-2		Conta Pagamento? Não		

PROTEGIDA POR SIGILO FISCAL

DECLARAÇÃO DE BENS E DIREITOS

(Valores em Reais)

Atualizou o valor de algum bem imóvel e pagou o ganho de capital até 16/12/2024 de acordo com a Lei nº 14.973/2024?	Não

GRUPO	CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2023	SITUAÇÃO EM 31/12/2024
06	01	CONTA CORRENTE, BANCO C6 S/A. 105 - BRASIL Bem ou direito pertencente ao: Titular CPF: 286.551.298-36 CNPJ: 31.872.495/0001-72 Banco: 336 Agência: 0001 Conta: 7614102-0 Conta Pagamento? Não	344,25	66,30
TOTAL			2.103.094,42	2.101.890,28

DÍVIDAS E ÔNUS REAIS

(Valores em Reais)

CÓDIGO	DISCRIMINAÇÃO	SITUAÇÃO EM 31/12/2023	SITUAÇÃO EM 31/12/2024	VALOR PAGO EM 2024
11	CREDITO IMOBILIARIO, BANCO ITAU, CONTRATO 10118394007, FINANCIADO O VALOR DE R$ 630.000,00 . EM 2023 PARCELAS PAGAS R$ 41.588,70 REFERENTE A AQUISICAO APARTAMENTO TIPO NO 202, 20O ANDAR, TORRE A - TORRE FIGUEIRA, CONDOMINIO TARUMA, COM DIREITO A 3(TRES) VAGAS DE GARAGEM, LOCAIS INDETERMINADOS. PAGO EM 2024 R$ 119.213,08.	692.318,49	650.232,05	119.213,08
13	DA EMPRESA E-IT TECHNOLOGIES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 50,00, TOTAL R$ 10.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 1.520.000, CONFORME CONTRATO PARTICULAR DE 08/2021.EM 2021 PAGO R$ 118.750,00. EM 2022 PAGO R$ 285.000,00. EM 2023 PAGO R$ 318.917,89. EM 2024 PAGO R$ 502.143,31.	797.332,11	295.188,80	502.143,31
13	DA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA. ADQUIRIDO DE ROBERIO AUGUSTO DA SILVA LACERDA, CPF NO 177.516.888-31 EM 13/09/2021, ADQUIRIDO 200 QUOTAS, A R$ 10,00, TOTAL R$ 2.000. AGIL PAGO SOBRE AS QUOTAS, NO VALOR R$ 80.000, CONFORME CONTRATO PARTICULAR DE 08/2021. PAGO EM 2021 R$ 6.250. PAGO EM 2022 R$ 15.000. PAGO EM 2023 R$ 16.785,16. PAGO EM 2024 R$ 26.428,60.	41.964,84	15.536,24	26.428,60
16	VALOR ANTECIPADO PELA EMPRESA E-IT TECHNOLOGIES, CNPJ NO 12.349.468/0001-75, SALDO EM 31.12.2023. EM 2024 PAGO R$ 1.267.144,55.	4.367.341,54	3.100.196,99	1.267.144,55
16	VALOR ANTECIPADO PELA EMPRESA E-IT SERVICES CONSULTORIA DE INFORMATICA LTDA, CNPJ NO 31.412.442/0001-79, SALDO EM 31.12.2023.	79.824,37	79.824,37	0,00

PROTEGIDA POR SIGILO FISCAL

14	CONFORME INSTR PARTICULAR DE PARTICIPACAO DE COMPRA E VENDA DE QUOTAS SOCIETARIA FIRMADO EM 25.03.2024 JUNTO A EMPRESA E-IT TECHNOLOGIES, DETERMINA O PAGTO PELO COMPRADOR LUCIANO APARECIDO DE SOUZA, CPF NO 286.551.298/36, VENDEDOR SERGIO A S NORONHA, NAS CONDICOES: 24 PARCELAS NO VLR DE R$ 23.750,00 APARTIR 25.04.2024, 1 PARC INTERMEDIARIA DE R$ 46.000,00 A SER PAGA NO 12O MES E 1 PARC FINAL VLR R$ 46.750,00 NO 25O MES. A PATIR DO 13O MES PARC CORRIGIDAS PELO IPCA. TOTAL R$ 662.750,00. PAGO 2024 R$ 237.500.	0,00	425.250,00	237.500,00
14	CONFORME INSTR PARTICULAR DE PARTICIPACAO DE COMPRA E VENDA DE QUOTAS SOCIETARIA FIRMADO EM 25.03.2024 JUNTO A EMPRESA E-IT SERVICES, DETERMINA O PAGTO PELO COMPRADOR LUCIANO APARECIDO DE SOUZA, CPF NO 286.551.298/36 AO VENDEDOR SERGIO A S NORONHA, NAS CONDICOES: 24 PARCELAS, VALOR R$ 1.250,00, 1 PARCELA INTERMEDIARIA VALOR R$3.000 NO 12O MES, 1 FINAL VALOR R$ 2.845,55 NO 25O MES, TOTAL R$ 35.845,55. PAGO EM 2024 R$ 12.500,00.	0,00	23.345,55	12.500,00
TOTAL		5.978.781,35	4.589.574,00	2.164.929,54

DOAÇÕES A PARTIDOS POLÍTICOS E CANDIDATOS A CARGOS ELETIVOS

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DEMONSTRATIVO DE ATIVIDADE RURAL - BRASIL

DADOS E IDENTIFICAÇÃO DO IMÓVEL EXPLORADO - BRASIL

Sem Informações

RECEITAS E DESPESAS - BRASIL

Sem Informações

APURAÇÃO DO RESULTADO - BRASIL

Sem Informações

MOVIMENTAÇÃO DO REBANHO - BRASIL

Sem Informações

BENS DA ATIVIDADE RURAL - BRASIL

Sem Informações

DÍVIDAS VINCULADAS À ATIVIDADE RURAL - BRASIL

Sem Informações

PROTEGIDA POR SIGILO FISCAL

DEMONSTRATIVO DE ATIVIDADE RURAL - EXTERIOR

DADOS E IDENTIFICAÇÃO DO IMÓVEL EXPLORADO - EXTERIOR

Sem Informações

RECEITAS E DESPESAS - EXTERIOR

Sem Informações

APURAÇÃO DO RESULTADO - EXTERIOR

Sem Informações

MOVIMENTAÇÃO DO REBANHO - EXTERIOR

Sem Informações

BENS DA ATIVIDADE RURAL - EXTERIOR

Sem Informações

DÍVIDAS VINCULADAS À ATIVIDADE RURAL - EXTERIOR

Sem Informações

DEMONSTRATIVO DA APURAÇÃO DOS GANHOS DE CAPITAL

Sem Informações

PROTEGIDA POR SIGILO FISCAL

RENDA VARIÁVEL - OPERAÇÕES COMUNS/DAYTRADE - TITULAR

GANHOS LÍQUIDOS OU PERDAS - JAN

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - FEV

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - MAR

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - ABR

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - MAI

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - JUN

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - JUL

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - AGO

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - SET

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - OUT

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - NOV

Sem Informações

GANHOS LÍQUIDOS OU PERDAS - DEZ

Sem Informações

RENDA VARIÁVEL - OPERAÇÕES COMUNS/DAYTRADE - DEPENDENTES

Sem Informações

FUNDOS DE INVESTIMENTO IMOBILIÁRIO OU NAS CADEIAS PRODUTIVAS AGROINDUSTRIAIS - TITULAR

Sem Informações

FUNDOS DE INVESTIMENTO IMOBILIÁRIO OU NAS CADEIAS PRODUTIVAS AGROINDUSTRIAIS - DEPENDENTES

Sem Informações

DOAÇÕES DIRETAMENTE NA DECLARAÇÃO - ECA

Sem Informações

DOAÇÕES DIRETAMENTE NA DECLARAÇÃO - IDOSO

Sem Informações

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2025** **ANO-CALENDÁRIO 2024**

RESUMO — TRIBUTAÇÃO UTILIZANDO AS DEDUÇÕES LEGAIS

RENDIMENTOS TRIBUTÁVEIS

Recebidos de Pessoa Jurídica pelo titular	93.153,71
Recebidos de Pessoa Jurídica pelos dependentes	0,00
Recebidos de Pessoa Física/Exterior pelo titular	0,00
Recebidos de Pessoa Física/Exterior pelos dependentes	0,00
Recebidos acumuladamente pelo titular	0,00
Recebidos acumuladamente pelos dependentes	0,00
Resultado tributável da Atividade Rural	0,00
TOTAL	93.153,71

DEDUÇÕES

Contribuições às previdências oficial e complementar fechada de que trata o § 15 do art. 40 da CF/1988 (até o limite do patrocinador)	10.246,88
Contribuição à previdência oficial (Rendimentos recebidos acumuladamente)	0,00
Contribuição à prev. complementar, inclusive o valor para as fechadas de que trata o § 15 do art. 40 da CF/1988 que exceder o limite do patrocinador	0,00
Dependentes	4.550,16
Despesas com instrução	7.123,00
Despesas médicas	0,00
Pensão alimentícia judicial	0,00
Pensão alimentícia por escritura pública	0,00
Pensão alimentícia judicial (Rendimentos recebidos acumuladamente)	0,00
Livro caixa	0,00
TOTAL	21.920,04

IMPOSTO DEVIDO

Base de cálculo do imposto	71.233,67
Imposto devido	8.848,27
Dedução de incentivo	0,00
Imposto devido I	8.848,27
Imposto devido RRA	0,00
Aliquota efetiva (%)	9,49
Total do imposto devido	8.848,27

IMPOSTO A RESTITUIR	3.210,16
SALDO DE IMPOSTO A PAGAR	0,00

PARCELAMENTO

Valor da quota	0,00
Número de Quotas	0

IMPOSTO PAGO

Imposto retido na fonte do titular	12.058,43
Imp. retido na fonte dos dependentes	0,00
Carnê-Leão do titular	0,00
Carnê-Leão dos dependentes	0,00
Imposto complementar	0,00
Imposto pago no exterior	0,00
Imposto retido na fonte (Lei nº 11.033/2004)	0,00
Imposto retido RRA	0,00
Total do imposto pago	12.058,43

INFORMAÇÕES BANCÁRIAS

Tipo de Conta	Conta Corrente
Banco	341
Agência (sem DV)	4054
Conta para crédito	2780 2

PROTEGIDA POR SIGILO FISCAL

NOME: LUCIANO APARECIDO DE SOUZA
CPF: 286.551.298-36 **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**
DECLARAÇÃO DE AJUSTE ANUAL **EXERCÍCIO 2025** **ANO-CALENDÁRIO 2024**

EVOLUÇÃO PATRIMONIAL

Bens e direitos em 31/12/2023	2.103.094,42
Bens e direitos em 31/12/2024	2.101.890,28
Dívidas e ônus reais em 31/12/2023	5.978.781,35
Dívidas e ônus reais em 31/12/2024	4.589.574,00

OUTRAS INFORMAÇÕES

Rendimentos isentos e não tributáveis	1.400.112,41
Rendimentos sujeitos à tributação exclusiva/definitiva	0,00
Rendimentos tributáveis - imposto com exigibilidade suspensa	0,00
Depósitos judiciais do imposto	0,00
Imposto pago sobre Ganhos de Capital	0,00
Imposto pago Ganhos de Capital Moeda Estrangeira - Bens, direitos e Aplicações Financeiras	0,00
Total do imposto retido na fonte (Lei nº11.033/2004), conforme dados informados pelo contribuinte	0,00
Imposto pago sobre Renda Variável	0,00
Doações a Partidos Políticos e Candidatos a Cargos Eletivos	0,00
Imposto a pagar sobre o Ganho de Capital - Moeda Estrangeira em Espécie	0,00
Imposto diferido dos Ganhos de Capital	0,00
Imposto devido sobre Ganhos de Capital	0,00
Imposto devido sobre ganhos líquidos em Renda Variável	0,00
Imposto devido sobre Ganhos de Capital Moeda Estrangeira - Bens, direitos e aplic. financeiras	0,00

PROTEGIDA POR SIGILO FISCAL

MINISTRY OF FINANCE **INCOME TAX - INDIVIDUAL**

SPECIAL SECRETARIAT OF THE FEDERAL REVENUE OF BRAZIL TAX YEAR 2025 CALENDAR YEAR 2024

RECEIPT FOR THE SUBMISSION OF THE ANNUAL ADJUSTMENT DECLARATION - OPTION FOR LEGAL DEDUCTIONS

AMENDED DECLARATION No. 1

TAXPAYER IDENTIFICATION

CPF of the taxpayer	Name of the taxpayer	Telephone
286.551.298-36	LUCIANO APARECIDO DE SOUZA	

Address	Number	Unit
RUA JOSE GONCALVES GALEAO	93	APT. 202, TORRE A

Neighborhood/District	ZIP Code	City	State
JARDIM AVELINO	03227-150	SAO PAULO	SP

(Values in Reais)

TOTAL TAXABLE INCOME	93.153,71
TAX DUE	8.848,27
TAX TO BE REFUNDED	3.210,16
BALANCE OF TAX PAYABLE	0,00
TAX PAYABLE CAPITAL GAIN – CURRENCY IN CASH	0,00
REFUND BANK CODE	341
BRANCH	4054
ACCOUNT FOR CREDIT	2780-2

Declaration received via Internet JV
by the Receiving Agent SERPRO
(Federal Data Processing Service)
on 06/11/2025 at 4:36:41 pm
3432816008

MINISTRY OF FINANCE **INCOME TAX - INDIVIDUAL**

SPECIAL SECRETARIAT OF THE FEDERAL REVENUE OF BRAZIL TAX YEAR 2025 CALENDAR YEAR 2024

Mr. LUCIANO APARECIDO DE SOUZA, , registered under the CPF No. 286.551.298-36.

THE RECEIPT NUMBER for your declaration submitted on 06/11/2025, at 4:36:41 pm, is:

01.67.40.78.69 - 25

This number is for personal use and SHOULD NOT be provided to third parties. It is mandatory to amend this return.

Check your return, verify pending issues, pay the tax, check your refund, download copies of documents, and more through:

- Federal Revenue Digital Services Portal https://servicos.receitafederal.gov.br
- Federal Revenue APP on your mobile device

Attention: Keep this number to provide it in the 2026 return, in the field "Receipt number of the last return filed for the 2025 tax year".

Information on the Darf Printing

The Annual Adjustment Statement Program for Individual Income Tax allows the printing of the Darf for the payment of all installments, including those overdue. The Darf will be printed with interest equivalent to the reference rate of the Special System for Settlement and Custody (Selic) for federal securities, accumulated monthly, calculated from 06/02/2025 until the month prior to payment, and 1% in the month of payment.

If the installment payment is made after its due date, a late payment penalty of 0.33% per day will apply, with a maximum limit of 20%.

For printing the Darf, in the Declaration Generator Application, the taxpayer should use the option **Declaration / Print / Darf of the IRPF** and select the installment for printing.

In the case of installments resulting from amended declarations that lead to a change in tax payable, for printing the DARF, access the e-CAC Portal on the RFB (Brazilian Federal Revenue) website at (http://gov.br/receitafederal). Then, click on **"Declarations and Statements"**, select the service **"My Income Tax (DIRPF Statement Extract)"**. In the list of services found, click on "**Payment** - **Check Debts, Issue DARF**, and **Change Installments**". After viewing the quantity of installments and the status of each one, click on the "**Print**" icon to generate the DARF for the desired month.

Additional Information

Tax Year	Tax Audit
2020	No
2021	No
2022	No
2023	No
2024	Yes

=> Tax Audit discrepancies are typically issues that can be resolved by the taxpayer.

=> Pending debits usually refer to unpaid amounts or amounts paid with the wrong codes.

For further clarification and guidance on how to resolve these discrepancies, consult the IRPF Statement.

Follow the processing of your declaration on the e-CAC or on your mobile device.

I, André Vinícius Inacio Penna Mello, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 16, 2026.

MINISTÉRIO DA FAZENDA	IMPOSTO SOBRE A RENDA - PESSOA FÍSICA
SECRETARIA ESPECIAL DA RECEITA FEDERAL DO BRASIL	EXERCÍCIO 2025 ANO-CALENDÁRIO 2024

RECIBO DE ENTREGA DA DECLARAÇÃO DE AJUSTE ANUAL - OPÇÃO PELAS DEDUÇÕES LEGAIS

DECLARAÇÃO RETIFICADORA Nº 1

IDENTIFICAÇÃO DO DECLARANTE

CPF do declarante	Nome do declarante	Telefone
286.551.298-36	LUCIANO APARECIDO DE SOUZA	

Endereço	Número	Complemento
RUA JOSE GONCALVES GALEAO	93	APTO 202, TORRE A

Bairro/Distrito	CEP	Município	UF
JARDIM AVELINO	03227-150	SAO PAULO	SP

(Valores em Reais)

TOTAL RENDIMENTOS TRIBUTÁVEIS	93.153,71
IMPOSTO DEVIDO	8.848,27
IMPOSTO A RESTITUIR	3.210,16
SALDO DO IMPOSTO A PAGAR	0,00
IMPOSTO A PAGAR GANHO DE CAPITAL - MOEDA EM ESPÉCIE	0,00

RESTITUIÇÃO CÓDIGO DO BANCO	341
AGÊNCIA BANCÁRIA	4054
CONTA PARA CRÉDITO	2780-2

Declaração recebida via Internet JV
pelo Agente Receptor SERPRO
em 11/06/2025 às 16:36:41
3432816008

MINISTÉRIO DA FAZENDA **IMPOSTO SOBRE A RENDA - PESSOA FÍSICA**

SECRETARIA ESPECIAL DA RECEITA FEDERAL DO BRASIL **EXERCÍCIO 2025** **ANO-CALENDÁRIO 2024**

Sr(a) LUCIANO APARECIDO DE SOUZA, inscrito no CPF sob o nº 286.551.298-36.

O NÚMERO DO RECIBO de sua declaração apresentada em 11/06/2025, às 16:36:41, é:

01.67.40.78.69 - 25

Este número é de uso pessoal e NÃO deve ser fornecido a terceiros. Ele é obrigatório para retificar esta declaração.

Consulte sua declaração, verifique pendências, pague o imposto, consulte sua restituição, baixe cópia de documentos e mais pelo:

- Portal de Serviços Digitais da Receita Federal https://servicos.receitafederal.gov.br
- APP Receita Federal no seu dispositivo móvel

Atenção: Guarde este número para informá-lo na declaração do exercício de 2026, no campo "Nº do recibo da última declaração entregue do exercício de 2025".

Informações sobre a Impressão do Darf

O programa da Declaração de Ajuste Anual do Imposto sobre a Renda da Pessoa Física permite a impressão do Darf para pagamento de todas as quotas, inclusive as em atraso. O Darf será impresso acrescido de juros equivalentes à taxa referencial do Sistema Especial de Liquidação e Custódia (Selic), para títulos federais, acumulada mensalmente, calculados a partir de 02/06/2025 até o mês anterior ao do pagamento e de 1% no mês do pagamento.

Se o pagamento da quota for efetuado após o seu vencimento, incidirá multa de mora de 0,33% ao dia, observado o limite máximo de 20%.

Para impressão do Darf, no Programa Gerador de Declarações, o contribuinte deve utilizar a opção **Declaração** / **Imprimir** / **Darf do IRPF** e selecionar a quota que deseja imprimir.

No caso de quotas decorrentes de declarações retificadoras em que ocorra mudança de imposto a pagar, para impressão do DARF acesse o Portal e-CAC no site da Receita Federal na Internet (https://www.gov.br/receitafederal/pt-br). Em seguida, clique em "**Declarações e Demonstrativos**", selecione o serviço "**Meu Imposto de Renda**". Serviços, clique em "**Consultar Débitos, Emitir DARF e Alterar Quotas**". Após visualizar o quantitativo de quotas e a situação de cada uma delas, clique no ícone "**Impressão**" para emitir o DARF do mês desejado.

Informações Adicionais

Exercício	Malhas
2020	Não
2021	Não
2022	Não
2023	Não
2024	Sim

=> Pendências de Malhas normalmente são questões que podem ser resolvidas pelo contribuinte.

=> Pendências de Débitos normalmente referem-se a valores não liquidados ou pagos com códigos errados.

Para maiores esclarecimentos e orientações sobre como resolver essas pendências consulte o Extrato do IRPF.

Acompanhe o processamento da sua declaração no seu dispositivo móvel App Receita Federal ou no Portal e-CAC.

'GLASSDOOR'

Chief Technology Officer Salaries

Salaries Interviews

Chief Technology Officer Salaries (Brazil)

Experience

All years of experience

Base salary

R$ 17 thousand - R$ 35 thousand / month

R$ 24 thousand / month Average base salary

Variable remuneration

R$ 14 thousand / month Average

R$ 4 thousand - R$ 21 thousand / month Range

About our data

Very high confidence Last updated: July 4, 2024 156 salaries sent

How do we calculate compensation?

What do you think of the **average base salary range** of **R$17,000-R$35,000/month?**

Low

It needs

High

Your input helps Glassdoor refine our salary estimates over time.

Companies on the Rise for Chief Technology Officer — Brazil ⓘ

Search by company or location

1,581 Companies Seeking CTO Positions

Sort by **popularity**

We are Education 4.1 ★

Create job alert

R$ 22 thousand - R$ 28 thousand/month Full payment

R$ 25 thousand Average

Technology Director

Linx 3.8 ★

16 vacancies open

R$ 32 thousand - R$ 53 thousand/month Full payment

R$ 42 thousand Average

Technology Director

Jones Lang LaSalle 3.8 ★

4 thousand vacancies open

R$ 15 thousand - R$ 18 thousand/month Full payment

R$ 16 thousand Average

Technology Director

Save Me! 4.7 ★

Create job alert

R$ 20 thousand - R$ 34 thousand/month Full payment

R$ 27 thousand Average

Technology Director

Thera Solutions 4.3 ★

Create job alert

R$ 3 thousand - R$ 50 thousand/month Full payment

R$ 26 thousand Average

Technology Director

1 2 3 4 5 ... 317

Showing 1 - 5 of 1581 results

Recent salaries shared by Chief Technology Officer professionals

Location

Todos os anos de exper...

200 salaries

Sort by **most recent**

Position | Years of experience
Location
Shipping date

Full payment
Base · Variable remuneration

Technology Director | 10 to 14 years old
Sao Paulo, SP
Shipping date: June 1, 2021

R$ 244 thousand / year
R$ 224 thousand · R$ 20 thousand

Technology Director | 4 to 6 years old
Sao Paulo, SP
Submission date: September 11, 2025

R$ 195 thousand - R$ 228 thousand / year

Technology Director | More than 15 years
Sao Paulo, SP
Shipping date: June 1, 2021

R$ 968 thousand / year
R$ 488 thousand · R$ 480 thousand

Technology Director | More than 15 years
Curitiba
Shipping date: August 28, 2025

R$ 698 thousand / year
R$ 698 mil · R$ 0

Technology Director | 1 to 3 years
Fortaleza, CE
Shipping date: August 1, 2025

R$ 276 thousand - R$ 321 thousand / year

Share your salary confidentially and help the community. Add salary

Technology Director | More than 15 years
Curitiba
Shipping date: July 21, 2025
R$ 476 thousand / year
R$ 476 mil · R$ 0

Technology Director | 10 to 14 years old
Vitoria, ES
Shipping date: July 18, 2025
R$ 185 thousand / year
R$ 185 mil · R$ 0

Technology Director | 1 to 3 years
Balneário Camboriú
Shipping date: July 7, 2025
R$ 72 thousand / year
R$ 72 mil · R$ 0

Technology Director | 4 to 6 years old
Sao Jose dos Campos, SP
Shipping date: July 4, 2025
R$ 210 thousand / year
R$ 210 mil · R$ 0

Technology Director | 7 to 9 years old
Belo Horizonte, MG
Shipping date: July 3, 2025
R$ 278 thousand - R$ 324 thousand / year

1 2 3 4 5 ... 20 ›

Showing 1 to 10 of 200

Chief Technology Officer Salary FAQs

What is the salary for the position of Chief Technology Officer (Brazil)?

What is the highest salary for a Technology Director (Brazil)?

What is the lowest salary for a Chief Technology Officer (Brazil)?

Salaries › Technology Director › Brazil

'GLASSDOOR'

Glassdoor
About/Press
Awards
Blog
Contact us

Companies
Create a free business account
Company area

Information
Help
Community Rules
Terms of Use
Privacy and Ad Choices
Do not sell or share my information
Cookie Consent Tool

Work with us
Advertisers
Careers

Download the app:

Brazil

Search by: Companies, Vacancies, Locations

Copyright © 2008-2025. Glassdoor LLC. "Glassdoor", "Worklife Pro", "Bowls", and the Glassdoor logo are trademarks owned by Glassdoor LLC.

Exhibit C.II - Second Prong: Evidence of Financial Viability and Company Assets

ACCOUNTING STATEMENT

DOMINGOS ORESTES CHIOMENTO
Accountant: Owner of DOC CONTABILIDADE EMPRESARIAL SS
CNPJ No. 63.033.328/0001-24
Regional Accounting Council (CRC) No. 1SP032010/O-0
Address: RUA CHAMANTÁ, 1055 – ZIP Code: 03127-001 – VILA PRUDENTE – SÃO PAULO - SP

To Whom It May Concern,

I, **Domingos Orestes Chiomento**, accountant, owner of **DOC Contabilidade Empresarial**, enrolled with the National Register of Legal Entities (CNPJ) under No. **63.033.328/0001-24**, hereby declare, for all due purposes, that Mr. **Luciano Aparecido de Souza**, Brazilian, married, holder of CPF No. **286.551.298-36**, carries out professional activities as co-owner and CEO of **E-IT Technologies Consultoria de Informática LTDA**, enrolled with the National Register of Legal Entities (CNPJ) under No. **12.349.468/0001-75**, and has been our client since **01/01/2021**.

Based on the accounting, tax, and financial records reviewed in the regular course of providing professional services, I hereby certify that Mr. **Luciano Aparecido de Souza** holds an ownership interest that grants him control over the aforementioned company, including management authority and powers to dispose of its assets, as provided for in its constitutional documents.

Furthermore, I hereby declare that **E-IT Technologies Consultoria de Informática LTDA** has financial resources available in the amount of **R$1,000,000.00**, as duly reflected in its accounting records and financial statements.

I further certify that, by virtue of his status as co-owner with executive management authority, Mr. **Luciano Aparecido de Souza** has full capacity and authority to deliberate on profit distribution, withdrawal of funds, and the allocation of the company's resources, and may make such funds available for investment purposes at any time, subject to the applicable legal and corporate provisions.

Lastly, I hereby declare that the aforementioned funds are derived from lawful sources, are duly recorded in the company's accounting records, and are consistent with the tax returns filed.

We remain at your disposal should any additional information or clarification be required.

Sincerely,



Domingos Orestes Chiomento
CPF: 004.109.938-91
CRC/SP: 1SP032010/O-0

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.

DECLARAÇÃO CONTÁBIL

DOMINGOS ORESTES CHIOMENTO
Contador: Titular da DOC CONTABILIDADE EMPRESARIAL SS
CNPJ nº 63.033.328/0001-24
CRC nº 1SP032010/O-0
Endereço: RUA CHAMANTÁ, 1055 – CEP: 03127-001 – VILA PRUDENTE – SÃO PAULO - SP

A quem possa interessar,

Eu, **Domingos Orestes Chiomento**, contador, titular da **DOC Contabilidade Empresarial**, inscrito no Cadastro Nacional da Pessoa Jurídica (CNPJ) sob o nº **63.033.328/0001-24**, declaro, para os devidos fins, que o Sr. **Luciano Aparecido de Souza**, brasileiro, casado, portador do CPF nº **286.551.298-36**, exerce atividades profissionais como sócio proprietário e de gestão executiva da empresa **E-IT Technologies Consultoria de Informática LTDA**, inscrita no Cadastro Nacional da Pessoa Jurídica (CNPJ) sob o nº **12.349.468/0001-75**, sendo nosso cliente desde **01/01/2021**.

Com base na documentação contábil, fiscal e financeira analisada no curso regular da prestação de serviços profissionais, certifico que o Sr. **Luciano Aparecido de Souza** detém participação societária que lhe confere controle sobre a referida empresa, incluindo poderes de administração e disposição patrimonial, conforme previsto em seus atos constitutivos.

Adicionalmente, declaro que a empresa **E-IT Technologies Consultoria de Informática LTDA** possui disponibilidade financeira no montante de **R$1.000.000,00**, devidamente refletida em seus registros contábeis e demonstrações financeiras.

Certifico, ainda, que, em razão de sua condição de sócio proprietário com poderes de gestão executiva, o Sr. **Luciano Aparecido de Souza** possui plena capacidade e autoridade para deliberar sobre a distribuição de lucros, retirada de valores ou alocação de recursos da empresa, podendo tornar tais valores disponíveis para fins de investimento, a qualquer tempo, observadas as disposições legais e societárias aplicáveis.

Por fim, declaro que os referidos recursos possuem origem lícita, encontram-se devidamente registrados na contabilidade da empresa e são compatíveis com as declarações fiscais apresentadas.

Permanecemos à disposição para quaisquer esclarecimentos adicionais, caso necessário.

Atenciosamente,



Domingos Orestes Chiomento
CPF: 004.109.938-91
CRC/SP: 1SP032010/O-0

Consolidated Investment Statement

05/11/2026 at 12:50:06 p.m.

Company Name: **E-IT TECHNOLOGIES CON INF LTDA**
Branch/Account: **8136/00552-0**

Investments	Net Balance
Investment Funds	**410,425.61**
MAPFRE CONFIANZA (Fixed Income Fund)	410,425.61
Financial Products (CDB, Repurchase Agreements, Structured Investments, and Bills)	**594,593.28**
CDB-DI	594,593.28
Total[1]	1,005,018.89

(1) Total: This total does not include holdings in stocks, corporate savings accounts, or stocks held in book-entry form by Itaú. Amounts are subject to change until the close of business due to any transactions posted during the day. Financial products not disclosed in this consolidated statement may be consulted individually through the appropriate information channel.

For investment advice and information, contact your account manager or Investfone at 4004-4828 (state capitals and metropolitan areas) or 0800 970 4828 (other locations). For questions, suggestions, or complaints, if necessary, contact Itaú Customer Service (SAC) at 0800 728 0728, available 24 hours a day, every day, or use the Contact Us service (www.itau.com.br). If you wish to request a review of the solution provided after using these channels, contact the Itaú Corporate Ombudsman's Office at 0800 570 0011, available on business days from 9:00 a.m. to 6:00 p.m., or by mail at P.O. Box No. 67,600, ZIP Code 03162-971. For hearing- or speech-impaired individuals, call 0800 722 1722, available 24 hours a day, every day.

I, Marina Viana Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that I have performed the professional translation of this document from Portuguese to English as a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.

Marina Viana

Date: July 16, 2026

Itaú ItaúEmpresas 30 horas

Posição consolidada de investimentos

11/05/2026 às 12:50:06h

Nome da empresa: **E-IT TECHNOLOGIES CON INF LTDA**
Agência/Conta: **8136/00552-0**

Investimentos	Saldo líquido
Fundos de Investimento	**410.425,61**
MAPFRE CONFIANZA RF	410.425,61
Produtos Financeiros (CDB, Compromissada, Invest. Estruturados e Letras)	**594.593,28**
CDB-DI	594.593,28
Total[(1)]	1.005.018,89

(1) Total: não estão contempladas as posições em ações, poupança PJ, e ações escrituradas pelo Itaú. Valores sujeitos a alterações até o fechamento do dia, em função de eventuais lançamentos efetuados. Os produtos não divulgados nesta posição consolidada poderão ser consultados de forma individual, no canal de divulgação especifico.

Consultoria e informações sobre investimentos fale com seu gerente ou entre em contato com o Investfone 4004-4828 (capitais e regiões metropolitanas) ou 0800 970 4828 (demais localidades). Dúvidas, sugestões e reclamações, se necessário, utilize o SAC Itaú 0800 728 0728, todos os dias, 24h, ou o Fale Conosco (www.itau.com.br). Se desejar a reavaliação da solução apresentada após utilizar esses canais, recorra à Ouvidoria Corporativa Itaú 0800 570 0011, dias úteis, das 9 às 18h, Caixa Postal nº 67.600, CEP 03162-971. Deficientes auditivos ou de fala 0800 722 1722, disponível 24hs todos os dias.

Exhibit C.II - Second Prong: Letters of Support

APEX TOOL GROUP

September 30, 2025

To Whom It May Concern,

I am pleased to recommend Luciano Aparecido de Souza for opportunities in the United States.

I have had the privilege of working with Luciano since 2012 as he supported our need to implement the E-GT Enhanced Global Trade importation module for our manufacturing facility in Sorocaba Brazil. At that time, I was the Business Applications Manager for our company and was responsible for IT project implementations. My association with the project, business users and other IT colleagues allowed me to closely observe the strong technical expertise and leadership demonstrated by Luciano.

Given the successful implementation in 2012, we also solicited his support in 2013 for a business system upgrade. And again in 2015 we selected Luciano to implement the E-GR Enhanced Goods Receipt functionality for inbound automation. His support in these projects and implementations was very valuable and provided key capabilities for our company to ensure efficiencies, cost control and reliable processes to ensure stable and reliable means to support our manufacturing requirements and our customer demands.

Luciano has proven key technical skills and abilities, but also routinely demonstrates his strengths in leadership, developing innovative solutions for complex issues, meeting critical deadlines as well as his skill in working effectively with our internal IT team and business users. He has become a trusted partner for our business.

I am confident that his future contributions will be equally impactful and it is without hesitation that I would gladly work with Luciano for other projects in the future and would recommend him to other leaders and organizations.

In conclusion, I firmly believe that Luciano Aparecido de Souza possesses the qualifications, expertise, and vision to contribute significantly to this field in the United States and I support their application and trust that their presence will benefit the professional community.

Sincerely,

Glenn Gunter
Sr. Director, Application Services
Apex Tool Group, LLC
Glenn.Gunter@apextoolgroup.com / 919.387.2634

Eastman Chemical Co.
200 South Wilcox Dr.
Kingsport, Tennessee
37660 US

www.eastman.com

Leo Anderson
Contractor Governance SAP Technical Lead Architect
Eastman Chemical Co.
200 S Wilcox Dr., Kingsport, TN - 37660
anderson@eastman.com – 423-229-1288
May 14, 2026

To Whom It May Concern,

I am writing this letter in strong support of Luciano Aparecido de Souza's EB-2 NIW visa application. I have had the privilege of knowing and working with Luciano for well over a decade, and during this time, I have consistently been impressed by his technical expertise, leadership, and visionary contributions to our company's SAP Logistics Foreign Trade and Goods Electronic Receipt systems landscape.

I first worked closely with Luciano during our collaboration at Solutia Inc., later acquired by Eastman Chemical Co., where we entered in an agreement to have his services to implement a complex foreign trade solution that transformed our ability to manage importations of raw materials and resale goods across multiple continents into South America. Luciano's ability to understand not just SAP technical infrastructure but also Brazil's multi-layered tax and compliance framework was pivotal to the success of that initiative. His work directly contributed to cost reductions, improved compliance, streamlined logistics, and empowered our operations to scale efficiently across Latin America.

In recent years, Luciano's innovation has continued through his work at E-IT, a company he founded to fill critical gaps in our SAP ecosystem. Among the notable systems he designed, developed and implemented at Solutia Inc. and later to Eastman Chemical Co are:

- E-GT: A Foreign Trade system that integrates with SAP to streamline import/export operations.

- E-GR: A robust tool for validating and processing Brazilian Electronic Invoices (NF-e) based on XML files, vastly improving the speed and security of goods receipt processing.

- E-FCI: A solution for calculating and generating the Brazilian "Ficha de Conteúdo de Importação (FCI)" fully integrated with SAP ECC and compliant with legal mandates such as Ajuste Sinief 19 and 20.

Luciano's solutions are not only technically impressive but also remarkably user-friendly, bridging the gap between high-performance backend logic and intuitive front-end design. These systems have been adopted across our diverse business segments, demonstrating his broad impact on Brazil's enterprise and trade sectors.

What truly sets Luciano apart is his rare combination of deep SAP technical mastery, hands-on development skills, and exceptional business acumen in areas like logistics, foreign trade, and tax compliance. He has proven himself repeatedly as a strategic thinker and a trusted advisor to clients, partners, and teammates.

Luciano is a great mind, inspiring those who he works with, and he is a leader-developer always ready to coach and share his wide knowledge in SAP systems with values and interpersonal skills that are as impressive as his technical abilities. His contributions go far beyond project execution as they are systemic, scalable, and aligned with company's economic priorities, making him an excellent candidate for the National Interest Waiver program.

Eastman Chemical Co.
200 South Wilcox Dr.
Kingsport, Tennessee
37660 US

www.eastman.com

It is without hesitation that I strongly support Luciano Aparecido de Souza's petition for the EB-2 NIW visa. His continued presence and innovation in the United States will undoubtedly benefit the fields of international trade technology, enterprise software, and public sector compliance systems.

If you require any further information, I would be happy to provide it.

Sincerely,



Leo Anderson
Contractor Governance SAP Technical Lead Architect
Eastman Chemical Co.

RESPONSIBLE CARE®
OUR COMMITMENT TO SUSTAINABILITY

External Use

Michael Powell

Director, IT Product Management – Manufacturing Operations & Supply Chain

419-819-9670

mpowellbr@gmail.com

June 14, 2026

USCIS

Attn: I-140 / NIW Adjudication

Applicable Service Center

RE: Letter of Recommendation in Support of the EB-2 National Interest Waiver (NIW)
Petition of Luciano Aparecido de Souza

To Whom It May Concern,

I am writing this letter to offer my strongest, unreserved support for the immigrant petition of Luciano Aparecido de Souza for an EB-2 National Interest Waiver (NIW). As a senior professional with more than twenty years of experience leading global information technology and digital enterprise transformations, I am uniquely positioned to evaluate Mr. De Souza's technical mastery, leadership capabilities, and the significant national value of his proposed business endeavor in the United States.

I have known Mr. De Souza for several years, having worked closely alongside him during my tenure at Corning Incorporated. In my capacity leading enterprise systems and digital initiatives, I partnered and collaborated with E-IT Technologies lead by Mr. De Souza on multiple high-stakes SAP deployments and complex regulatory integration projects. Through this direct working relationship, I observed firsthand his exceptional talent for architecting robust enterprise software solutions that bridge technical complexity with vital operational compliance.

P. 1

Mr. De Souza's proposed endeavor—establishing an independent SAP consulting firm in the United States—carries profound substantial merit and national importance. Modern American manufacturing and critical logistics infrastructure rely fundamentally on enterprise resource planning (ERP) systems like SAP to keep supply chains resilient, transparent, and operational. Currently, the U.S. market faces a severe, systemic shortage of top-tier SAP architects capable of executing massive, complex digital migrations.

By launching a specialized consulting firm, Mr. De Souza directly addresses this economic bottleneck. His enterprise will scale the delivery of specialized consulting services, enabling domestic U.S. corporations to modernize their digital infrastructure, optimize material flow, and maintain global competitiveness. Disruptions or delays in these large-scale technology transformations can cost American industries millions of dollars in operational downtime; Mr. De Souza's venture directly mitigates this vulnerability, aligning with national priorities to strengthen domestic industrial and technology sectors.

Mr. De Souza possesses a rare elite expertise that places him at the very top of his field, making him exceptionally well-positioned to drive this endeavor to success. During our time together at Corning Inc., he was instrumental in leading complex SAP implementations that required a meticulous understanding of data architecture, financial accounting systems, and global trade compliance.

In particular, Mr. De Souza spearheaded critical Brazilian government statutory tax compliance projects ($SPED$, fiscal reporting, and digital invoicing requirements). The Brazilian tax and digital reporting framework is widely recognized as one of the most complex, volatile, and technically demanding regulatory environments in the world. Mr. De Souza successfully engineered and integrated these intricate localized tax mandates into Corning's global SAP architecture, ensuring seamless compliance, zero operational disruption, and flawless multi-currency financial reporting.

His performance demonstrated a profound ability to deconstruct dense regulatory landscapes and translate them into stable, scalable software solutions. A professional who can successfully navigate and automate systems within such a rigorous framework possesses the exact high-level analytical capabilities required to solve the most daunting enterprise architecture challenges facing U.S. companies today.

Given the specialized nature and national urgency of Mr. De Souza's enterprise, requiring him to undergo the standard labor certification process would be counterproductive to the interests of the United States. The traditional labor certification is designed to test the local market for a minimally qualified worker to fill a specific, localized corporate vacancy. Mr. De Souza is not seeking to fill a routine IT seat; he is an elite industry expert launching an

P. 2 M

enterprise designed to scale solutions across multiple U.S. corporate supply chains simultaneously.

To delay his work through a lengthy administrative process would deprive the U.S. technology sector of crucial expertise at a time when digital modernization and supply chain integrity are paramount. On balance, the United States stands to benefit substantially from waiving the job offer and labor certification requirements for an innovator of his caliber.

Conclusion

Luciano Aparecido de Souza is a professional of extraordinary capability, possessed of a rare technical skill set that is in critical demand across American industry. I have absolute confidence that his SAP consulting firm will deliver immense value to the U.S. economy, corporate infrastructure, and technology workforce. I urge you to approve his National Interest Waiver petition without delay.

Please do not hesitate to contact me if you require any additional information regarding his qualifications or past professional contributions.

Sincerely,

6/14/2026

Michael Powell

Director, IT Product Management – Manufacturing Operations & Supply Chain

GAF Materials Corp

1 Campus Drive Parsippany, NJ 07054

P. 3 M

Michael Douglas Powell
Phone: (419) 819-9670 Email: mpowellbr@gmail.com
390 Falcon Road, Reidsville, North Carolina 27320
LinkedIn: www.linkedin.com/in/lean-supplychain-mes

Technology Executive – IT/OT, Supply Chain, and Manufacturing Operations | Translating Vision into Reality

Summary

20+ years of leadership experience driving Process & System Transformation, Supply Chain Optimization, and Software Innovation for Fortune 500 giants—Toyota, Whirlpool, and Corning.

Rare dual competency in **Advanced IT/OT Strategy** (Boundary System Modernization, SAP S/4HANA, Manufacturing Execution Systems) and **Lean Operational Excellence** (Toyota Production System, Six Sigma Black Belt). Expert in integrated supply chain material flow optimization. Proven track record of bridging the gap between technical execution and business goals to deliver multi-million-dollar cost savings, revenue enablement, and efficiency gains. Skilled in defining product roadmaps, managing IT operations ($50M+), and leading cross-functional global teams through complex solution delivery.

Soft Skills / Values

- Kindness / Empathy
- Vision Development
- Critical Thinking
- Cross-Functional Engagement
- Influencing at All Levels
- Active Listening
- Team Building / Coaching
- Delegating with Trust
- Change Management
- Portuguese (conversational)

Lean Skills

- Certified Six Sigma Black Belt
- Toyota Production System, TPS
- Lean Manufacturing, SQDC
- JIT, JIS, Material Flow, PFEP
- Continuous Improvement
- Problem Solving, PDCA
- Process Mapping, VSM
- Kaizen, Gemba, DMAIC
- A3, 5S, Pull, Kanban
- Data Analysis, SPC, JMP

Technical Skills

- SAP S/4HANA Transformation
- Certified ITIL Service Mgmt.
- Certified Information Analyst
- Industry 4.0 Digital MFG
- Roadmap / Strategic Planning
- IT Business Operations
- Finance & Budget Execution
- SDLC, Waterfall, Scrum/Agile
- Microsoft SQL Server, Office
- Google Suite including AI

Professional Experience

GAF Materials Corporation **March 2024 to Present**
Parsippany, New Jersey—Remote

- **Director, IT Product Management – Manufacturing Operations & Supply Chain**

  Own end-to-end process and system transformation of SAP S/4HANA Maintenance & Manufacturing including alignment with executive stakeholders across the enterprise supporting 31 plants. Accountable for resource planning, budgeting, and oversight for the successful implementation of technology supporting new plant start-ups, as well as the boundary systems to SAP S/4HANA. Orchestrated strategic pivot from legacy Maximo to SAP Enterprise Asset Management (EAM), securing VP/CIO/COO approval resulting in $5.5M in cost avoidance.

Corning Incorporated **November 2018 to March 2024**
Charlotte, North Carolina—Remote

- **IT Global Supply Chain—Chief of Staff & Global Service Owner**

  Progressed through expanding roles culminating in full financial and strategic ownership of the global supply chain service offerings (CMDB, ITSM, ITAM, and ServiceNow) supporting $14B in annual revenue and 30+ global plants. Served as Chief of Staff to DVP/CIO to run, grow, and transform Corning's digital Supply Chain managing resources (160+) and hiring plan for NA, EMEA, and AP regions while negotiating vendor partnerships, licensing, RFPs, SOWs, and contract renewals. Managed the Annual Operating Plan ($50M budget) consistently exceeding cost reduction targets. Developed the strategic roadmap to consolidate 29 legacy ERP instances into a unified SAP S/4HANA digital core. Steered vital SAP ECC projects that enabled $165M in additional annual revenue, supporting major acquisitions (France 3M) and joint ventures (Saudi Arabia). Led a multi-cloud migration program, moving 91 SAP systems and 45 PeopleSoft systems to AWS Private Cloud and SAP HEC. Sponsored a Supply Chain TPM program that reduced security vulnerabilities by 54%, upgrading aging operating systems ahead of schedule.

Whirlpool Corporation **December 2012 to October 2018**
Multiple—Clyde, Ohio | Corporate—Remote | Findlay, Ohio

- **Manager, Materials Engineering | Business Lead, Manufacturing Execution System—North America | Lead Engineer, Materials**

  Promoted and progressed through several engineering leadership roles. Led a diverse team managing material flow, automation (63 AGVs), and packaging for Clyde operations (21k units/day). Hand-selected by the VP of Integrated Supply Chain and successfully recovered the distressed Manufacturing Execution System (MES) program. Aligned plant leaders and corporate directors to deploy DELMIA APRISO at Whirlpool's World Class Manufacturing (WCM) focus plant. MES product owner and leader of Center of Excellence designing KPIs for downtime tracking and Quality Assurance. Designed, developed, and deployed MES/e-Kanban system at the Findlay plant (13k units/day), reducing Work-In-Progress (WIP) inventory by $1M and increasing assembly yield all while completing a Six Sigma Black Belt certification in Customer Centered Operational Excellence. Trained 100+ salary and hourly employees at Findlay in 1x1 problem solving and coached weekly resulting in individual ownership and productivity gains.

IMB Connecting **June 2009 to December 2012**
Ribeirão Preto, São Paulo | Fortaleza, Cerá | São Luís, Maranhão Bazil

- **Field Representative, Brazil**

  Relocated family to Brazil to lead philanthropic initiatives. Founded a Brazilian NGO partnering with a local manufacturer to deliver clean water solutions to thousands. Led volunteer teams in the construction and staffing of a health clinic providing medical care to underserved communities and partnered with a local Doctor of Medicine to continue monthly services to the community with his students. Achieved Advanced-High proficiency in Portuguese.

Toyota North America **June 1999 to June 2009**
Georgetown, Kentucky

- **Senior Specialist, Production Control – BPSM, 2 years | Information Systems – Manufacturing & Supply Chain, 8 years**

  Foundational lean leadership experience within the rigorous Toyota Production System (TPS). Instrumental in developing Toyota's integrated supply chain systems to eliminate WIP of NA Parts (100%) from TMMK and managed $10M+ projects for facility start-ups (Texas, Alabama, Indiana, and Subaru); leading cross-functional teams to implement critical factory floor systems.

Electronic Data Systems Corporation—EDS **June 1996 to June 1999**
Spring Hill, Tennessee | Southfield, Michigan | Dallas, Texas | Plano, Texas

- **Information Analyst, GM Saturn | Mobil Oil | EDS Technical Development & CIO Services**

  Completed technical development graduating top of the class to become a certified Information Analyst while serving as a consultant to GM Saturn; optimizing just-in-time delivery and third-party logistics visibility and Mobil Oil; supporting the renovation of Mobil Oil's global financial accounting mainframe system, ensuring enterprise-wide data integrity and system continuity.

Education, Certifications, & Training

- **Master of Arts**, Missiology | Southern Baptist Theological Seminary, KY
- **Bachelor of Science**, Industrial Technology | Southern Illinois University at Carbondale, IL
- **Associate of Science**, Engineering | Paducah Community College, KY
- **SAP S/4HANA**: Essential Training & Beyond the Basics (LinkedIn Learning)
- **Agentic AI Fundamentals**: Architectures, Frameworks, and Applications (LinkedIn Learning)
- **Certified ITIL 4 Foundations** in Service Management (PeopleCert / AXELOS)
- **Certified Six Sigma Black Belt** (Whirlpool & Six Sigma Associates)
- **Toyota Production System (TPS) / Lean** (10 Years Classroom & OJT)
- **Certified Information Analyst** (EDS Technical Development, Top of Class)
- **Languages**: English (Native), Portuguese (Advanced/Conversational)

To Whom It May Concern,

I am pleased to provide this letter of recommendation in support of Mr. Luciano Aparecido de Souza and his application to establish and expand his professional activities in the United States.

I had the opportunity to work closely with Luciano during my tenure at Corning International in Latin America, where I held senior leadership positions including Director of Strategy & Business Development, Vice President, and later President for Latin America. During that period, Luciano and his company, E-IT Technologies, supported Corning in several highly strategic SAP and foreign trade automation projects in Brazil.

Luciano consistently distinguished himself as a highly competent, reliable, and technically sophisticated professional, with deep expertise in SAP ERP integrations, foreign trade systems, bonded warehouse processes, and operational automation.

Over approximately seven years of collaboration, I personally witnessed his ability to manage complex projects involving multiple stakeholders, strict regulatory requirements, and mission-critical operational environments.

His technical knowledge, combined with strong business understanding, allowed him to deliver practical and scalable solutions in highly demanding scenarios.

One of the most relevant projects we worked on together involved the implementation and stabilization of SAP ECC6 operations in Brazil, including the integration of specialized foreign trade management systems developed and supported by E-IT Technologies.

Luciano played an important role in helping Corning automate importation processes and improve operational efficiency during a critical phase of the company's expansion in Brazil.

In addition, Luciano participated in studies and technical discussions related to bonded warehouse operations and customs process optimization, which required a sophisticated understanding of logistics, tax structures, SAP architecture, and Brazilian foreign trade regulations. I clearly remember his ability to quickly understand business requirements and translate them into effective technical solutions.

Beyond his technical capabilities, Luciano consistently demonstrated professionalism, integrity, entrepreneurial mindset, and a strong customer-oriented approach. He communicated effectively with executive leadership, operational teams, consultants, and technical specialists alike. His combination of technical depth and business acumen is uncommon and made him a valuable partner to Corning throughout multiple initiatives.

Based on my experience working with Luciano, I am fully confident that he possesses the expertise, leadership skills, and innovative mindset necessary to successfully develop and grow technology-related operations in the United States, particularly in areas involving SAP ecosystems, enterprise automation, logistics integration, and foreign trade solutions.

I strongly support Luciano Aparecido de Souza and believe he will make meaningful contributions to the business and technology community in the United States. I would not hesitate to work with him again in the future and can confidently recommend him for this endeavor.

Please feel free to contact me should you require any additional information.

Sincerely,

ALVARO PIERO MARZULLO:16751538847

Digitally signed by ALVARO PIERO MARZULLO:16751538847
Date: 2026.05.25 11:40:46 -03'00'

Alvaro Marzullo
Vice President Latin America & Caribbean
CAMIN Cargo Control
São Paulo, Brazil
alvamar7777@me.com / Alvaro.Marzullo@camincargo.com
+55 11 98215-4888

Contact

alvamar7777@me.com

www.linkedin.com/in/alvaromarzullo (LinkedIn)

Top Skills

Business Strategy
Negotiation
Management

Languages

Spanish (Native or Bilingual)
English (Native or Bilingual)
Portuguese (Native or Bilingual)

Certifications

CMT, Corporate Management Training
Certified in Administration and Performance of Service Contracts, Energy Resource Center
GLAC, Global Leadership Program
CREA
DOL, Dimensions of Leadership II and III

Alvaro Marzullo Bonnefont

Global Executive | President & C-Suite Leader | MBA, P.E. | Entrepreneur I Corporate Development & M&A | Growth Strategy & Business Transformation | P&L Leadership | Energy, TIC, Industrial | LATAM & Asia I AI Super User
São Paulo, São Paulo, Brazil

Summary

Senior business executive with 25+ years leading growth, transformation, and P&L performance across the Energy, TIC, Materials Science, and Industrial Equipment sectors. Skilled in turning strategy into results through operational excellence, innovation and M&A.

Global perspective built from living and working in the U.S., China, and Latin America, with deep expertise navigating complex markets across Latin America and Asia. Strong track record in managing multinational teams, driving market expansion, and executing high-value transactions (12 M&A deals completed across the Americas and Europe).

Core Expertise
- Regional P&L ownership up to USD 200M, leading 1,800+ employees.
- Strategic growth and market expansion in Latin America.
- M&A leadership: acquisitions, integrations, and synergies.
- Lean/Kaizen champion for sustained efficiency and performance.
- Cross-cultural leadership in dynamic, multicultural environments.

Former international rugby player, bringing the discipline, resilience, and team-first mindset of elite sports into business. Passionate about building businesses, developing people, and leading organizations to outperform in competitive global markets.

Experience

Camin Cargo Control Inc.
Vice President, Latin America
November 2024 - Present (1 year)

São Paulo, Brazil

Vice President & General Manager – Latin America & The Caribbean; Reports directly to the U.S.-based COO and serves on the CEO's extended leadership team (SMT). Full P&L responsibility across Latin America and the Caribbean, overseeing strategic planning, revenue growth, and operational execution across multiple business lines and geographies. Leads a high-performing organization of 700+ employees, including 11 direct reports, across 15 countries. Drives business performance through strong leadership, cross functional collaboration, and execution discipline. Responsible for identifying and executing M&A opportunities and leading regional expansion into key sectors such as Oil & Gas, Biofuels, Mining, and Agriculture.
Key Achievements:
- Delivered 18% organic sales growth in 2025 YTD, exceeding targets.
- M&A, acquired a TIC company in Chile in 5 months, SCI - Servicios de Inspección y Calidad.
- Co-led complex, multi-party negotiations with key strategic customers, resulting in long-term supply contracts that strengthened business continuity and client partnerships.

Eurofins

Senior Vice President, Latin America

January 2021 - June 2024 (3 years 6 months)
Indaiatuba, São Paulo, Brazil

Senior Vice President and General Manager; Member of the extended Group Operating Council (GOC). Served as Officer, Statutory Managing Director, and Regional Business Leader for Eurofins across Latin America. Provided strategic leadership to strengthen the Group's presence in key sectors, including Oil & Gas, Environmental, Food & Feed, Agri-Science, Pharmaceuticals, and Cosmetics, in alignment with global priorities. Held full P&L responsibility and oversaw all regional operations, including legal, compliance, financial reporting, Code of Conduct, FCPA adherence, and ESG initiatives. Accountable for the health, safety, and security of all employees, assets, and facilities. Led an organization of 1,800+ employees and 11 direct reports across Latin America. Reported to the Executive Vice President & General Manager based in Madrid, Spain.
Results achieved:
- Grew sales organically by 14% YoY on average, achieving a record regional EBITDA (considering the past seven years).
- M&A: Successfully led the acquisition and integration of four companies in South America.

- Surpassed all company targets concerning quality, cost productivity, TaT, NPS and ESG objectives.
- Successful turnaround of the Environmental Testing Business line in twelve months (2022).
- Led several complex negotiations with major customers ranging from USD 500K to USD 10M, for long-term supply agreements.

Corning Incorporated

7 years

President, Latin America

September 2017 - February 2021 (3 years 6 months)

São Paulo, Brazil

President and General Manager; Member of the Corporate Management Group (CMG), serving as Officer, Statutory Managing Director, and Regional Business Leader for Corning in Latin America. Responsible for developing and executing local strategies in collaboration with global divisions to drive regional growth. Held full P&L accountability and oversaw all aspects of operations, including legal compliance, financial reporting, Code of Conduct, and FCPA adherence. Ensured the health, safety, and security of employees, assets, and facilities across the region. Led a team of 12 direct reports and over 1,200+ employees across multiple countries. Reported to the Division President and General Manager based in Singapore. Played a key role in advancing an ambitious growth agenda for Latin America across Telecommunications, Mobile Emissions Control, Life Sciences, Consumer Electronics, and Specialty Materials.

Results achieved:

- Consistently surpassed all company targets, with an average of 12% increase in sales YoY in Latin America (2014 to 2021).
- M&A, successful integration of Bargoa in Brazil, completed in a record time with two SAP Go-live implementations.
- M&A, successful acquisition and integration of Samsung’s Cable division in Latin America, on time with no loss of customers.
- M&A, successful acquisition and integration of 3M’s Telecom Division, in seven countries across Latin America, on time as well.
- In 2019, co-led the negotiation with a major telecom carrier in Brazil, closing a U$150M contract for two years of supply of fiber to the home products (FTTH), an all-time company record in the region.

Vice President of Strategy & Business Development, Latin America

March 2014 - September 2017 (3 years 7 months)

São Paulo, Brazil

Eaton

President & General Manager, South America

October 2012 - March 2014 (1 year 6 months)

Votorantim, São Paulo, Brazil

President & General Manager – South America; Served as Officer, Statutory Managing Director, and Regional Business Leader with full P&L responsibility for the manufacturing of electrical products for harsh and hazardous (Ex) environments. Reported to the Division Vice President based in the U.S.
Led total operations across South America, managing 9 direct reports and a team of 660 employees. Responsible for driving operational performance and executing an aggressive growth strategy focused on the Oil & Gas, Infrastructure, Mining, and Energy sectors.
Results achieved:
- Increased sales by 16% in 2013, turning around the business in twelve months and achieving breakeven by December 2013.
- M&A, integration of Blinda's acquisition completed in less than ten months with two SAP Go-live implementations.
- M&A, integration of all Cooper Crouse Hinds business units as a result of Eaton's global acquisition.
- Successfully expanded the Eaton legacy business by consolidating three sites into a new location in Votorantim. Implemented SAP for increased efficiency, capturing synergies and positioning the business for profitable growth in the future. This strategic move resulted in a significant 17% reduction in overall costs.
- Improved on-time delivery to 92% by implementing a forecasting process aligned with the commercial teams in the region.

CIRCOR International, Inc.

Director of Business Development, Latin America

March 2009 - October 2012 (3 years 8 months)

Piracicaba, São Paulo, Brazil

Statutory Officer, Managing Director, and Business Leader with full P&L responsibility, reporting directly to the Division Vice President in the U.S. Led the M&A team for both sales and engineering initiatives. Accountable for driving Circor Energy's growth strategy across Latin America, with a focus on the Energy, Oil & Gas, Ethanol, and Process industries. Oversaw all business functions, including sales, operations, HR, finance, marketing, and strategic planning. Managed a team of eight direct reports and a total workforce of 190

employees. Completed a 12-month international assignment in Suzhou, China, serving as interim General Manager of the local manufacturing plant.
Results achieved:
- Successful M&A transaction with the acquisition and integration of SF Válvulas, resulting in a notable 17% increase in sales within the first year, post-acquisition.
- Implemented global supply chain channels in less than 60 days, a company record involving this kind of operation.
- Remotely managed an engineering team in India and a quality inspection body in China.
- Won Frost & Sullivan's "2011 Brazil Market Share Leadership Award" for Industrial Valves.

Armstrong International – Intelligent Solutions in Steam, Air and Hot Water

18 years 1 month

General Manager, Latin America

May 2004 - March 2009 (4 years 11 months)
São Paulo, Brazil

Business Leader and Statutory Managing Director with full P&L responsibility, reporting directly to the Vice President in the U.S. Spearheaded the implementation of a Lean-driven valve and skid assembly operation, overseeing all aspects of the business—including sales, manufacturing, HR, marketing, engineering, project management, and supply chain. Led a specialized business unit focused on automation and control systems for industrial valves, pipeline infrastructure, engineered skids, and turnkey solutions across the Energy, Oil & Gas, and Process industries. Managed a team of 8 direct reports and a total of 110 employees.
Results achieved:
- Average of 8% increase in sales YoY in South America, from 2004 to 2009.
- Implemented Lean manufacturing processes, reducing overall costs by 7% YoY on average (cost productivity).
- Headcount increase through remote project management simultaneously developed in Brazil, Chile, and Argentina.

Sales Director, South America

September 2001 - May 2004 (2 years 9 months)
São Paulo, Brazil

Progressed from Trainee to Sales Director for South America (1991–2004), with increasing responsibilities over a 13-year tenure. Led the regional

sales structure and growth strategy, including channel management, margin optimization, marketing initiatives, and pricing execution. Played a pivotal role in two M&A transactions, actively participating in due diligence, deal closing, and post-merger integration. Managed a team of 12 direct reports and coordinated up to 50 remote subcontractors. Completed an intensive, yearlong executive training program at Armstrong's Service Headquarters in Orlando, Florida, in 1998.
Results achieved:
- Average of 10% yearly increase in sales in Brazil, and 5% in South America.
- Signed several long-term supply agreements with key fortune 500 companies, automatically renewed.

Sales Manager, South America
June 1997 - September 2001 (4 years 4 months)
São Paulo, Brazil

Application Engineer, South America
February 1994 - June 1997 (3 years 5 months)
São Paulo, Brazil

Trainee
March 1991 - February 1994 (3 years)
São Paulo, Brazil

Education

IMD
Leadership Development Program, LDP · (2023 - 2023)

FGV - Fundação Getulio Vargas
Master of Business Administration, MBA Specialized In Strategy And Economic Intelligence · (2017 - 2019)

Universidade Presbiteriana Mackenzie
Engineer's degree, Mechanical Engineering · (1992 - 1997)

Colégio Presbiteriano Mackenzie

Saint John's School - Concepción, CHILE

Exhibit D - Personal Documents

1114192CE000000228181425D
To verify the authenticity of this document, scan the printed QR Code or visit the website: https://selodigital.tjsp.jus.br

FEDERATIVE REPUBLIC OF BRAZIL
CIVIL REGISTRY OF NATURAL PERSONS

BIRTH CERTIFICATE

Name
LUCIANO APARECIDO DE SOUZA

CPF Number
286.551.298-36

Registration
111419 01 55 1979 1 00069 145 0052871 43

Date of birth in full	Day	Month	Year
August fifteenth, nineteen seventy-nine	15	08	1979

Time of birth	City of birth	State
6:25 PM	São Bernardo do Campo	SÃO PAULO

Place of birth	City of birth	State	Sex
Principe Humberto Hospital	São Bernardo do Campo	SÃO PAULO	Male

Parent's name	City of birth	State
MARINEIDE ALVES DE SOUZA	Bodocó	PERNAMBUCO

Respective Grandparent(s)
LEONARDA ALVES DE SOUZA; DOMINGOS JOSÉ DE SOUZA

Date of registration	Number of Live Birth Certificate
August twenty-ninth, nineteen seventy-nine	NO RECORD.

Notes/Annotations
Recorded in Book A No. 69, on page No. 145, under No. 52871. 1) Married Cristiane Ariça Fioriti, in a religious ceremony with civil effect, celebrated on 06/07/2008, and registered at the Civil Registry of São Paulo/Capital, Alto da Mooca Subdistrict, on 06/16/2008, book B-Aux. 34, page 186, No. 3584, starting signing as Cristiane Ariça Fioriti Souza, pursuant to the communication received. São Bernardo do Campo, 06/27/2008. 2) The registrant is the holder of CPF No. 286.551.298-36, according to a search conducted on this date in the database of the Federal Revenue Service of Brazil made available through the Civil Registry Information Center - CRC. São Bernardo do Campo, 10/09/2025. There is nothing further for me to certify.

CNS No. 111419
FIRST CIVIL REGISTRY OFFICE OF NATURAL PERSONS
AND OF INTERDICTIONS AND GUARDIANSHIPS
SÃO BERNARDO DO CAMPO - SÃO PAULO

EUGÊNIO TONIN
REGISTRAR

RUA RIO BRANCO No. 270/278 - CENTRO
ZIP Code: 09710-090 - São Bernardo do Campo - SP

The content of this certificate is true. I certify.

São Bernardo do Campo - SP, October 11, 2025.

CIVIL REGISTRY 1st SUBDISTRICT
Camilly Viana Goncalves
Clerk
SÃO BERNARDO DO CAMPO
PHONE: 4330 - 2366

----//signature//----

Camilly Viana Goncalves
Clerk

Fees R$ - Registrar: R$73.81; SEFAZ: R$14.76; ISS (*Service Tax*): R$1.45; Total: R$90.02.

Verified by: Gabriela (89)

IA 01148368O

Scanned with CamScanner

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.

REPÚBLICA FEDERATIVA DO BRASIL
REGISTRO CIVIL DAS PESSOAS NATURAIS

1114192CE00000028181425D
Para conferir a procedência deste documento efetue a leitura do QR Code impresso ou acesse o endereço eletrônico https://selodigital.tjsp.jus.br

CERTIDÃO DE NASCIMENTO

Nome
LUCIANO APARECIDO DE SOUZA

Número do CPF
286.551.298-36

Matrícula
111419 01 55 1979 1 00069 145 0052871 43

Data de nascimento	Dia	Mês	Ano
Quinze de agosto de um mil novecentos e setenta e nove	15	08	1979

Horário de nascimento	Município da naturalidade	UF
18:25 horas	São Bernardo do Campo	SP

Local de nascimento	Município de nascimento	UF	Sexo
Hospital Principe Humberto	São Bernardo do Campo	SP	Masculino

Nome do(a) Genitor(a)	Município de nascimento	UF
MARINEIDE ALVES DE SOUZA	Bodocó	PE

Avô(ó)(s) respectivo(s)
LEONARDA ALVES DE SOUZA; DOMINGOS JOSÉ DE SOUZA

Data de registro	DNV
Vinte e nove de agosto de um mil novecentos e setenta e nove	NÃO CONSTA.

Anotações/Averbações
Lavrado no livro A nº 69, à folha nº 145, sob o nº 52871. 1) Casou-se com Cristiane Ariça Fioriti, casamento religioso c/efeito civil celebrado aos 07/062008, e registrado no Reg. Civil de SP/Cap. Subd. Alto da Mooca, aos 16/06/2008, lv. B-Aux. 34, fls. 186, nº 3584, adotando o nome de Cristiane Ariça Fioriti Souza, conforme comunicação recebida. SBCampo, 27/06/2008. 2) O registrado é portador do CPF nº. 286.551.298-36, conforme consulta realizada nesta data junto à base de dados da Receita Federal do Brasil disponibilizada pela Central de Informações do Registro Civil - CRC. SBCampo, 09/10/2025. Nada mais me cumpria certificar.

CNS nº111419
PRIMEIRO CARTÓRIO DE REGISTRO CIVIL DAS PESSOAS NATURAIS E DE INTERDIÇÕES E TUTELAS
SÃO BERNARDO DO CAMPO / SP

EUGÊNIO TONIN
OFICIAL

RUA RIO BRANCO, Nº 270/278 - CENTRO
CEP: 09710090 - São Bernardo do Campo - SP

O conteúdo da certidão é verdadeiro. Dou fé.
São Bernardo do Campo - SP, 11 de outubro de 2025.

REGISTRO CIVIL 1º SUBDISTRITO Camilly Viana Gonçalves Escrevente 4330-2366

Camilly Viana Goncalves
Escrevente

Custas R$ - Oficial: 73,81; SEFAZ: 14,76; ISS: 1,45; Total: 90,02

Conferente: Gabriela (89)

IA011483680

Industria Gráfica Brasileira Ltda

Scanned with CamScanner



REPÚBLICA FEDERATIVA DO BRASIL

PASSAPORTE
PASSPORT

TIPO / TYPE
P

PAÍS EMISSOR / ISSUING COUNTRY
BRA

PASSAPORTE Nº / PASSPORT No.
GE310072

SOBRENOME / SURNAME
DE SOUZA

NOME / GIVEN NAMES
LUCIANO APARECIDO

NACIONALIDADE / NATIONALITY
BRASILEIRO(A)

DATA DO NASCIMENTO / DATE OF BIRTH
15 AGO/AUG 1979

IDENTIDADE Nº / PERSONAL No.

SEXO / SEX
M

NATURALIDADE / PLACE OF BIRTH
SÃO BERNARDO DO CAMPO/SP

FILIAÇÃO / FILIATION
MARINEIDE ALVES DE SOUZA

DATA DE EXPEDIÇÃO / DATE OF ISSUE
16 MAI/MAY 2022

AUTORIDADE / AUTHORITY
SR/DPF/SP

VÁLIDO ATÉ / DATE OF EXPIRY
15 MAI/MAY 2032

P<BRADE<SOUZA<<LUCIANO<APARECIDO<<<<<<<<<<<<
GE310072<9BRA7908150M3205150<<<<<<<<<<<<<<06

Scanned with CamScanner



Scanned with CamScanner

Digital Seal No.: 1152952CE0000000142710217

To verify the authenticity of this document, scan the printed QR Code or access the electronic address https://selodigital.tjsp.jus.br

FEDERATIVE REPUBLIC OF BRAZIL
CIVIL REGISTRY OF NATURAL PERSONS

MARRIAGE CERTIFICATE

NAMES	CPF
LUCIANO APARECIDO DE SOUZA	286.551.298-36
CRISTIANE ARIÇA FIORITI SOUZA	166.602.168-71

REGISTRATION
115295 01 55 2008 3 00034 186 0003584-17

FULL BIRTH NAMES, DATES OF BIRTH, PLACE OF BIRTH, NATIONALITY, AND FILIATION OF THE SPOUSES

HE: LUCIANO APARECIDO DE SOUZA, born on August fifteenth, nineteen seventy-nine (08/15/1979), in São Bernardo do Campo - São Paulo, Brazilian, single, son of MARINEIDE ALVES DE SOUZA.
SHE: CRISTIANE ARIÇA FIORITI, born on August eleventh, nineteen seventy-six (08/11/1976), em São Caetano do Sul - São Paulo, Brazilian, single, daughter of MAURICIO ARIÇA FIORITI and MARIA DO SOCORRO FIORITI.

DATE OF MARRIAGE REGISTRATION IN FULL	DAY	MONTH	YEAR
JUNE SIXTEENTH, TWO THOUSAND EIGHT	16	06	2008

MARITAL PROPERTY REGIME

PARTIAL COMMUNITY PROPERTY, IN ACCORDANCE WITH THE APPLICABLE LAW

NAME EACH SPOUSE BEGAN TO USE (IF CHANGED)

HE: Continues to use the SAME NAME.
SHE: Started signing as CRISTIANE FIORETI SOUZA.

ANNOTATIONS / NOTES TO BE ADDED

REGISTRATION MADE IN BOOK B-0034, ON PAGE 186F, UNDER No. 3584. Religious marriage with civil effect celebrated on JUNE SEVENTH, TWO THOUSAND EIGHT (06/07/2008). THERE'S **NOTHING FURTHER FOR ME TO CERTIFY.**

REGISTRATION NOTES

LUCIANO APARECIDO DE SOUZA: NO RECORD.
CRISTIANE ARIÇA FIORITI: NO RECORD.
*The registration notes above do not exempt the interested party from presenting the original document when required by the requesting agency or when necessary for the identification of the holder.

33rd Subdistrict (Alto da Mooca)
Ilzete Verderamo Marques - Chief Registrar
Registrar
Rua da Mooca, 3878 - Alto da Mooca
03165-002 - Phone: (11) 2601-2909

The content of this certificate is true. I certify.
São Paulo, July 7, 2021

----//signature//----

Livia Lopes Leal
Authorized Clerk

FEES:
To the Registrar: R$29.00, To the Department of Finance: R$5.80, To ISS *(Service Tax):* R$0.59 Total: R$ 35.39 Form: 07/2021 Typed by: MC

115295 - AA000154485 05/21

Scanned with CamScanner

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 8, 2026.

Selo Digital nº. 1152952CE0000000142710217

Para conferir a procedência deste documento efetue a leitura do QR Code impresso ou acesse o endereço eletrônico https://selodigital.tjsp.jus.br

REPÚBLICA FEDERATIVA DO BRASIL
REGISTRO CIVIL DAS PESSOAS NATURAIS

CERTIDÃO DE CASAMENTO

NOMES

	CPF
LUCIANO APARECIDO DE SOUZA	286.551.298-36
CRISTIANE ARIÇA FIORITI SOUZA	166.602.168-71

MATRÍCULA
115295 01 55 2008 3 00034 186 0003584-17

NOMES COMPLETOS DE SOLTEIRO, DATAS DE NASCIMENTO, NATURALIDADE, NACIONALIDADE E FILIAÇÕES DOS CÔNJUGES

ELE: LUCIANO APARECIDO DE SOUZA, nascido no dia quinze de agosto de mil novecentos e setenta e nove (15/08/1979), em São Bernardo do Campo - SP, nacionalidade brasileira, solteiro, filho de MARINEIDE ALVES DE SOUZA.

ELA: CRISTIANE ARIÇA FIORITI, nascida no dia onze de agosto de mil novecentos e setenta e seis (11/08/1976), em São Caetano do Sul - SP, nacionalidade brasileira, solteira, filha de MAURICIO ARIÇA FIORITI e de MARIA DO SOCORRO FIORITI.

DATA DE REGISTRO DO CASAMENTO POR EXTENSO	DIA	MÊS	ANO
DEZESSEIS DE JUNHO DE DOIS MIL E OITO	16	06	2008

REGIME DE BENS DO CASAMENTO
COMUNHÃO PARCIAL DE BENS, DE ACORDO COM A LEI VIGENTE

NOME QUE CADA UM DOS CÔNJUGES PASSOU A UTILIZAR (QUANDO HOUVER ALTERAÇÃO)
ELE: Continua a usar o MESMO NOME.
ELA: Passou a usar o nome de CRISTIANE ARIÇA FIORITI SOUZA.

AVERBAÇÕES/ANOTAÇÕES À ACRESCER
REGISTRO FEITO NO LIVRO B-0034, ÀS FLS. 186F, SOB Nº 3584. Casamento religioso com efeito civil celebrado em SETE DE JUNHO DE DOIS MIL E OITO (07/06/2008). **NADA MAIS ME CUMPRIA CERTIFICAR.**

ANOTAÇÕES DE CADASTRO
LUCIANO APARECIDO DE SOUZA: SEM INFORMAÇÃO.
CRISTIANE ARIÇA FIORITI: SEM INFORMAÇÃO.
* As anotações de cadastro acima não dispensam a parte interessada da apresentação do documento original, quando exigido pelo órgão solicitante ou quando necessário para identificação de seu portador.

33º Subdistrito (Alto da Mooca)
Ilzete Verderamo Marques - Oficial Titular
Oficial
Rua da Mooca, 3878 - Alto da Mooca
03165002 - Fone (11) 2601-2909

O conteúdo da certidão é verdadeiro. Dou fé.
São Paulo, 07 de julho de 2021

Livia Lopes Leal
Escrevente Autorizada

EMOLUMENTOS:
Ao Oficial: R$ 29,00 À secretaria da fazenda: R$ 5,80 Ao ISS: R$ 0,59
Total: R$ 35,39 Guia: 07 /2021 Digitado por: MC

115295 - AA000154485 05/21

Scanned with CamScanner

FEDERATIVE REPUBLIC OF BRAZIL
CIVIL REGISTRY OF NATURAL PERSONS

BIRTH CERTIFICATE

NAME:
** ALANA FIORITI SOUZA **

REGISTRATION:
** 122747 01 55 2016 1 00334 033 0198815-61 **

DATE OF BIRTH IN FULL	DAY	MONTH	YEAR
JUNE NINETEENTH, TWO THOUSAND SIXTEEN	19	06	2016

TIME OF BIRTH	CITY OF BIRTH AND STATE
9:20 AM	SÃO PAULO - SÃO PAULO

CITY OF REGISTRATION AND STATE	PLACE OF BIRTH	SEX
SÃO PAULO - SÃO PAULO	HOSPITAL	FEMALE

FILIATION

CRISTIANE ARIÇA FIORITI SOUZA, born in São Caetano do Sul - São Paulo. ***
LUCIANO APARECIDO DE SOUZA, born in São Bernardo do Campo - São Paulo. ***

GRANDPARENTS

Maternal grandparents are: MAURICIO ARIÇA FIORITI and MARIA DO SOCORRO FIORITI. ***
Paternal grandmother is: MAXINEIDE ALVEZ DE SOUZA. ***

TWIN	NAME AND REGISTRATION OF THE TWIN(S)
NO	NO RECORD

DATE OF REGISTRATION IN FULL	NUMBER OF LIVE BIRTH CERTIFICATE
JUNE TWENTY-FIFTH, TWO THOUSAND SIXTEEN	30681533198

NOTES

As of the present date, no notes or annotations appear in the margin of this record. ***

Civil Registry Office - 26th Subdistrict - Vila Prudente
Rodrigo de Carvalho Guedes - Acting Registrar
Rua Orfanato No. 340 - São Paulo - SP ZIP Code: 03131-010
Phone: 2271-3300 - Fax: (11) 2271-3306
Email: vilaprudente@registrocivil.com.br

The content of this certificate is true. I certify.

São Paulo, June 25, 2016

----//signature//----

KATIA GOMES MACHADO
CLERK

EXEMPT FROM FEES

12274-7 - AA 000088292

Scanned with CamScanner

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.



REPÚBLICA FEDERATIVA DO BRASIL
REGISTRO CIVIL DAS PESSOAS NATURAIS

CERTIDÃO DE NASCIMENTO

NOME:
** ALANA FIORITI SOUZA **

MATRÍCULA:
** 122747 01 55 2016 1 00334 033 0198815-61 **

DATA DE NASCIMENTO POR EXTENSO	DIA	MÊS	ANO
DEZENOVE DE JUNHO DE DOIS MIL E DEZESSEIS	19	06	2016

HORA	MUNICÍPIO DE NASCIMENTO E UNIDADE DA FEDERAÇÃO
09:20	SÃO PAULO - SP

MUNICÍPIO DE REGISTRO E UNIDADE DA FEDERAÇÃO	LOCAL DE NASCIMENTO	SEXO
SÃO PAULO - SP	HOSPITAL	FEMININO

FILIAÇÃO
CRISTIANE ARIÇA FIORITI SOUZA, natural de São Caetano do Sul-SP.***
LUCIANO APARECIDO DE SOUZA, natural de São Bernardo do Campo-SP.***

AVÓS
Avós maternos: MAURICIO ARIÇA FIORITI e MARIA DO SOCORRO FIORITI. ***
Avó paterna: MARINEIDE ALVES DE SOUZA. ***

GÊMEO	NOME E MATRÍCULA DO(S) GÊMEO(S)
NÃO	SEM INFORMAÇÃO

DATA DO REGISTRO POR EXTENSO	DNV
VINTE E CINCO DE JUNHO DE DOIS MIL E DEZESSEIS	30681533198

OBSERVAÇÕES
Na margem do termo até a presente data não constam anotações ou averbações.***

Oficial de Registro Civil - 26°Sub - Vila Prudente
Rodrigo de Carvalho Guedes - Oficial Interino
Rua Orfanato n° 340 - São Paulo - SP CEP: 03131-010
Tel: 2271-3300 - Fax: (11) 2271-3306
E-mail: vilaprudente@registrocivil.com.br

O conteúdo da certidão é verdadeiro. Dou fé
São Paulo, 25 de junho de 2016

KÁTIA GOMES MACHADO
ESCREVENTE

ISENTO DE EMOLUMENTOS

12274-7 - AA 000088292
12274-7-01001-089000-0316

Scanned with CamScanner

FEDERATIVE REPUBLIC OF BRAZIL
STATE OF SÃO PAULO

DISTRICT, CITY AND JUDICIAL DISTRICT OF
SÃO CAETANO DO SUL

CIVIL REGISTRY OFFICE OF NATURAL PERSONS AND OTHER SERVICES OF DISTRIBUTORSHIP, PARTITION, AND ACCOUNTING

Valdomiro Borges Canto
Clerk

Caetano Grecco
Deputy Registrar

ELIZEU DE SOUZA ROLIM
MANOEL DOMINGOS DA OILYA
Authorized Clerks

DAVID FERNANDES MAFRA
NEUZA CRISTINA M. DE OLIVEIRA
Authorized Clerks

CIVIL REGISTRY OFFICE — WALDOMIRO BORGES CANTO CIVIL REGISTRY CLERK — MANOEL DOMINGOS DA SILVA Authorized Clerk — São Caetano do Sul - State of São Paulo

BIRTH CERTIFICATE

I CERTIFY that on page 169- of book A- -4- under No. 3918-
the birth record of --"**CHRISTIANE ARIÇA FIORITI**"-- was drawn up.
_____, born on August eleventh-
_____ nineteen seventy-six-
at 4:20 p.m., at São Caetano Hospital, in this city-
_____, female-, white-, daughter
of Mauricio Ariça Fioriti=
and Maria do Socorro Fioriti=
Paternal grandparents are: Manoel Ariça Corrales and Ms. Anna Fioriti=
_____
and maternal grandparents: Otavino Balbino and Ms. Nair de Macedo Balbino=
_____
The record was drawn up on August 13, 19 76 the
declarant being the father-
served as witnesses: those mentioned in the record.
_____
NOTES: _____

-----//Signature//----

The above is true and I certify.

São Caetano do Sul, August 13, 197 6.-

The Clerk

-----//Signature//----

MANOEL DOMINGOS DA SILVA
AUTHORIZED CLERK

Retirement Contribution Fee Paid
Form No. 33 / 76

CERTIFICATE	Cr$ 12.00
Retirement Fee	Cr$ 1.20
TOTAL PAID	Cr$ 13.20

Scanned with CamScanner

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 20, 2026.

REPÚBLICA FEDERATIVA DO BRASIL

ESTADO DE SÃO PAULO

DISTRITO, MUNICIPIO E COMARCA DE

SÃO CAETANO DO SUL

CARTÓRIO DO REGISTRO CIVIL DAS PESSOAS NATURAIS E ANEXOS DO DISTRIBUIDOR, PARTIDOR E CONTADOR

Waldemiro Borges Canto
Escrivão

Caetano Grecco
Of. Maior

ELIZEU DE SOUZA ROLIM
MANOEL DOMINGOS DA SILVA
Esc. Autorizados

DAVID FERNANDES MAFRA
HELOIZA CRISTINA M. DE OLIVEIRA
Esc. Habilitados

CARTÓRIO DO REGISTRO CIVIL — WALDOMIRO BORGES CANTO — ESCRIVÃO DO REGISTRO CIVIL — MANOEL DOMINGOS DA SILVA — Subst. Autorizado — São Caetano do Sul - Estado de São Paulo

CERTIDÃO DE NASCIMENTO

CERTIFICO que às fls. 169- do livro A- -4-, sob n.o 3918-
foi lavrado o assento de nascimento de --"CRISTIANE ARIÇA FIORITI"--
, nascid a no dia onze-
de agosto de mil novecentos e setenta e seis-
às 16 horas e 20 minutos, no Hosp. São Caetano,n/cidade-
, sexo feminino-, de cor branca-, filh a
de Mauricio Ariça Fioriti=
e de Maria do Socorro Fioriti=
São avós paternos: Manoel Ariça Corrales e Da. Anna Fioriti=
e avós maternos: Otavino Balbino e Da. Nair de Macedo Balbino=
O assento foi lavrado em 13 de Agosto de 19 76, tendo sido
declarante o pai-
serviram de testemunhas: as c/do termo.

OBSERVAÇÕES:

O referido e verdade e dou fé.
São Caetano do Sul, 13 de Agosto de 1976.-

O Escrivão

MANOEL DOMINGOS DA SILVA
ESCREVENTE AUTORIZADO

Taxa de Aposentadoria
Por Verba
Guia n.o 33/76

CERTIDÃO Cr$ 12,00
Taxa Apos. Cr$ 1,20
TOTAL Cr$ 13,20
PG.

Scanned with CamScanner

FEDERATIVE REPUBLIC OF BRAZIL
CIVIL REGISTRY OF NATURAL PERSONS

BIRTH CERTIFICATE

NAME:

** EMILLY FIORITI SOUZA **

REGISTRATION:

** 111286 01 55 2014 1 00554 192 0131040-40 **

DATE OF BIRTH IN FULL	DAY	MONTH	YEAR
SEPTEMBER FIFTEENTH, TWO THOUSAND FOURTEEN	15	09	2014

TIME OF BIRTH	CITY OF BIRTH AND STATE
10:09 PM	SÃO PAULO - SÃO PAULO

CITY OF REGISTRATION AND STATE	PLACE OF BIRTH	SEX
SÃO PAULO - SÃO PAULO	HOSPITAL	FEMALE

FILIATION

MOTHER: CRISTIANE ARIÇA FIORITI SOUZA, born in São Caetano do Sul, São Paulo. ***
FATHER: LUCIANO APARECIDO DE SOUZA, born in São Bernardo do Campo, São Paulo. ***

GRANDPARENTS

Maternal grandparents are: Mauricio Ariça Fioriti and Maria do Socorro Fioriti. ***
Paternal grandparents are: MAXINEIDE ALVEZ DE SOUZA. ***

TWIN	NAME AND REGISTRATION OF THE TWIN(S)
NO	NO RECORD

DATE OF REGISTRATION IN FULL	NUMBER OF LIVE BIRTH CERTIFICATE
SEPTEMBER SEVENTEENTH, TWO THOUSAND FOURTEEN	30629637344

NOTES / ANNOTATIONS

Born in this subdistrict, at Pro Matre Paulista. NOTHING FURTHER. ***

Civil Registry Office of Natural Persons of the 17th Subdistrict - Bela Vista
Flavia Benito Teixeira - Registrar
Avenida Brigadeiro Luiz Antônio, No. 1702 - São Paulo - SP
ZIP Code 01318-002
Phone/Fax: (11) 3284-9000
Email: cartorio17belavista@gmail.com

The content of this certificate is true. I certify.

São Paulo, September 17, 2014

----//signature//----

Sandra Maria dos Santos
Authorized Clerk

FEES:

To the Registrar: R$20.08, To IPESP: R$4.02, Total: R$24.10
Form: 211/14

Scanned with CamScanner

I, Carolina Favero da Silva, telephone number 415 425-2508, mailing address P.O. Box 90487, San Diego, CA 92169, certify that the professional translation of this document from Portuguese to English has been performed by myself, a qualified translator fluent in both languages, and that the following is an accurate and complete translation of the document.



Date: July 8, 2026.

REPÚBLICA FEDERATIVA DO BRASIL
REGISTRO CIVIL DAS PESSOAS NATURAIS

CERTIDÃO DE NASCIMENTO

NOME:
** EMILLY FIORITI SOUZA **
MATRÍCULA:
** 111286 01 55 2014 1 00554 192 0131040-40 **

DATA DE NASCIMENTO POR EXTENSO	DIA	MÊS	ANO
QUINZE DE SETEMBRO DE DOIS MIL E QUATORZE	15	09	2014

HORA	MUNICÍPIO DE NASCIMENTO E UF
22:09	SÃO PAULO - SP

MUNICÍPIO DE REGISTRO E UF	LOCAL DE NASCIMENTO	SEXO
SÃO PAULO - SP	HOSPITAL	FEMININO

FILIAÇÃO
MÃE: CRISTIANE ARIÇA FIORITI SOUZA, natural de São Caetano do Sul, SP.***
PAI: LUCIANO APARECIDO DE SOUZA, natural de São Bernardo do Campo, SP. ***

AVÓS
São avós maternos: Mauricio Ariça Fioriti e Maria do Socorro Fioriti. ***
São avós paternos: MARINEIDE ALVES DE SOUZA. ***

GÊMEO	NOME E MATRÍCULA DOS GÊMEOS
NÃO	NADA CONSTA

DATA DO REGISTRO POR EXTENSO	DEC. NASC. VIVO
DEZESSETE DE SETEMBRO DE DOIS MIL E QUATORZE	30629637344

OBSERVAÇÕES / AVERBAÇÕES
Nasceu neste subdistrito, na Pró Matre Paulista. NADA MAIS.***

Oficial de Registro Civil das Pessoas Naturais do 17º Subdistrito - Bela Vista
Flavia Benito Teixeira - Oficial
Avenida Brigadeiro Luiz Antonio, nº 1702 - São Paulo - SP
CEP 01318-002
Tel/Fax: (11)3284-9000
E-mail: cartorio17belavista@gmail.com

O conteúdo da certidão é verdadeiro. Dou fé
São Paulo, 17 de setembro de 2014

Sandra Maria dos Santos
escrevente autorizada

EMOLUMENTOS
Ao Oficial: R$ 20,06 Ao IPESP: R$ 4,02 Total: R$ 24,10 Guia: 211/14

Scanned with CamScanner

REPÚBLICA FEDERATIVA DO BRASIL

PASSAPORTE
PASSPORT

TIPO / TYPE
P

PAÍS EMISSOR / ISSUING COUNTRY
BRA

PASSAPORTE Nº / PASSPORT No.
GE310068

SOBRENOME / SURNAME
FIORITI SOUZA



NOME / GIVEN NAMES
ALANA

NACIONALIDADE / NATIONALITY
BRASILEIRO(A)

DATA DO NASCIMENTO / DATE OF BIRTH
19 JUN/JUN 2016

IDENTIDADE Nº / PERSONAL No.

SEXO / SEX
F

NATURALIDADE / PLACE OF BIRTH
SÃO PAULO/SP

FILIAÇÃO / FILIATION
LUCIANO APARECIDO DE SOUZA

CRISTIANE ARIÇA FIORITI SOUZA

O titular, enquanto menor, dependerá de autorização, na forma da lei, para viajar desacompanhado
[illegible] com um dos pais, indistintamente.

DATA DE EXPEDIÇÃO / DATE OF ISSUE
[illegible]MAY 2022

AUTORIDADE / AUTHORITY
SR/DPF/SP

DATE OF EXPIRY
[illegible]AY 2027

P<BRAFIORITI<SOUZA<<ALANA<<<<<<<<<<<<<<<<<<<<
3100680<0BRA1606199F2705158<<<<<<<<<<<<<<04

Scanned with CamScanner

REPÚBLICA FEDERATIVA DO BRASIL

PASSAPORTE
PASSPORT

TIPO / TYPE
P

PAÍS EMISSOR / ISSUING COUNTRY
BRA

PASSAPORTE Nº / PASSPORT No
GE310094

SOBRENOME / SURNAME
ARIÇA FIORITI SOUZA



NOME / GIVEN NAMES
[illegible]TIANE

NACIONALIDADE / NATIONALITY
BRASILEIRO(A)

DATA DE NASCIMENTO / DATE OF BIRTH
[illegible]AUG 1976

IDENTIDADE Nº / PERSONAL No

NATURALIDADE / PLACE OF BIRTH
SÃO CAETANO DO SUL/SP

[illegible]ARIÇA FIORITI

[illegible]RIA DO SOCORRO FIORITI

DATA DE EXPEDIÇÃO / DATE OF ISSUE
16 MAI/MAY 2022

AUTORIDADE / AUTHORITY
SR/DPF/SP

VÁLIDO ATÉ / DATE OF EXPIRY
15 MAI/MAY 2032

P<BRAARICA<FIORITI<SOUZA<<CRISTIANE<<<<<<<<<
GE310094<9BRA7608117F3205150<<<<<<<<<<<<<<06

Scanned with CamScanner

REPÚBLICA FEDERATIVA DO BRASIL

PASSAPORTE
PASSPORT



TIPO / TYPE
P

PAÍS EMISSOR / ISSUING COUNTRY
BRA

PASSAPORTE Nº / PASSPORT No
GE310073

SOBRENOME / SURNAME
FIORITI SOUZA

NOME / GIVEN NAMES
EMILLY

NACIONALIDADE / NATIONALITY
BRASILEIRO(A)

DATA DO NASCIMENTO / DATE OF BIRTH
15 SET/SEP 2014

IDENTIDADE Nº / PERSONAL No

SEXO / SEX
F

NATURALIDADE / PLACE OF BIRTH
SÃO PAULO/SP

FILIAÇÃO / FILIATION
LUCIANO APARECIDO DE SOUZA

CRISTIANE ARIÇA FIORITI SOUZA

O titular, enquanto menor, dependerá de autorização, na forma da lei, para viajar desacompanhado ou apenas com um dos pais, indistintamente.

DATA DE EXPEDIÇÃO / DATE OF ISSUE
16 MAI/MAY 2022

AUTORIDADE / AUTHORITY
SR/DPF/SP

VÁLIDO ATÉ / DATE OF EXPIRY
15 MAI/MAY 2027

P<BRAFIORITI<SOUZA<<EMILLY<<<<<<<<<<<<<<<<<<<<
GE310073<2BRA1409150F2705158<<<<<<<<<<<<<<02

Scanned with CamScanner



Scanned with CamScanner



Scanned with CamScanner



Scanned with CamScanner