CYMANII

the cybersecurity manufacturing innovation institute

Secure. TOGETHER

Who and What is CyManII?

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Manufacturing Sector Challenges

98% of U.S. Manufacturing is Small & Medium Mfg (SMMs):

- Least resourced and thus least qualified to defend
- Most unfair to put at risk
- Economic & resource pressures to rebuild US supply chain
- Aggregated risk to our national security and economic stability

56% of Manufacturers Hit by Ransomware in 2023.

33% + of Manufacturers Paid $$

Paid the ransom in an attempt to get their data back.

75% of Companies

Were unable to thwart the attacks before their data was fully encrypted.

32% of attacks resulted in both data theft and data encryption

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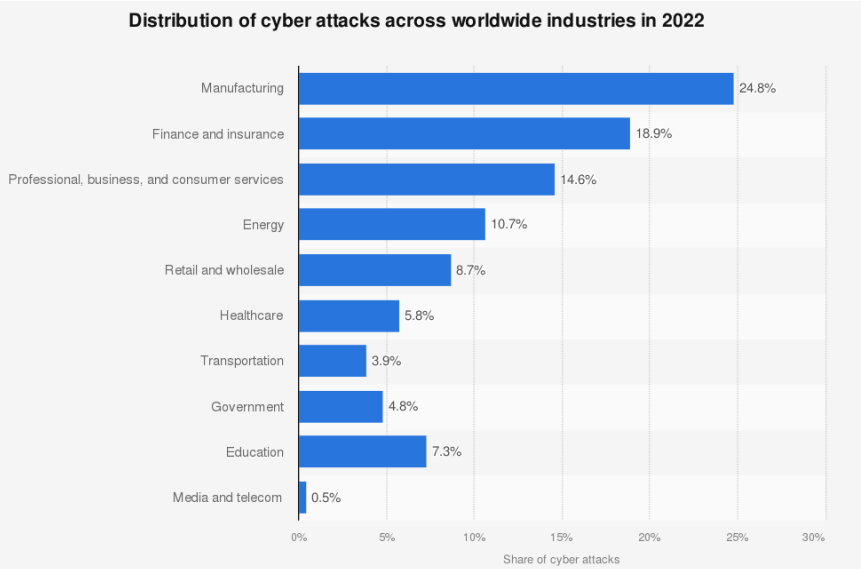

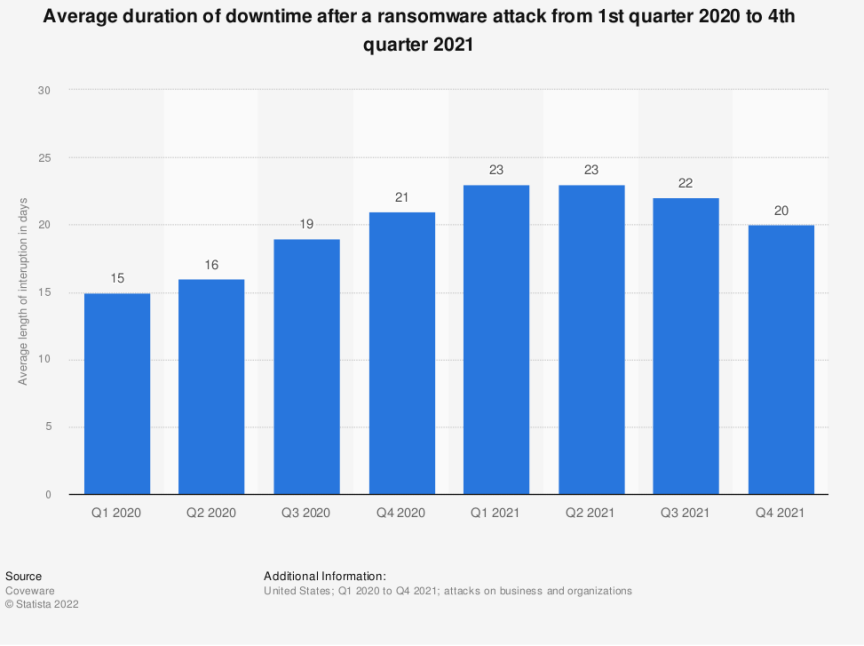

Be the most innovative cyber defense team in the world

CyManII's Vision

is to secure U.S. manufacturers as they digitize by fortifying their physical systems with embedded cybersecurity and energy-efficient solutions.

CyManII History, Team, Strategic Outcomes

AWARD: DOE Launched CyManII in November 2020

CORE TEAM: UTSA, ORNL, INL, Sandia, Purdue, Mason, Carnegie Mellon, Univ of Illinois, and Clemson

KEY CHALLENGE: Cyber Secure U.S. Manufacturing by Introducing Innovations that Enhance Energy Efficiency

TECHNICAL APPROACH: Agile Approaches to Developing *Secure Defensible Architectures, Identity-Centric Cyber Physical Passports, and Cybersecurity Energy and Emissions Quantification*

ADDITIONAL "WINS" TO DATE: Cybersecurity for Manufacturing (C4M) Hub, Cyber Mobile Training Vehicle (MTV), Cyber Boot Camp, and Secure Manufacturing Technology Hub

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CyManII by the Numbers at 4 Years

National Roadmap published and updated

24 research publications in top journals/conferences

Published CWE content for Critical Infrastructure (with MITRE: https://cwe.mitre.org/)

5 invention disclosures
(Proof-Carrying Passports, STAMP Software Trace of a Manufacturing Process/Product, Cyber-Physical Passport, and CyManII Attack Defense Annex, Physical Watermarking)

61 members to date

- **20 Managing Members**
- **7 Strategic Members**
- **27 Collaborative Members**
- **7 Community Members**

25 new members in 2024

40,000+ workers trained in over 350 SMMs

~$7M invested in competitive Industry Use Cases

Garnered over $7M in additional funding

- State of Texas (**$3M** / year for C4M and MTV)
- DOE (**$1M**, cyber boot camp)
- EDA (**$500K** for Secure Manufacturing Technology Hub)

Launched C4M – including nation's only CIE Lab

Hosted **15 "Industry Days"** across the U.S.

Launched Manufacturing-ISAC

Launched Cybersecurity Mobile Training Vehicle (Cyber-MTV)

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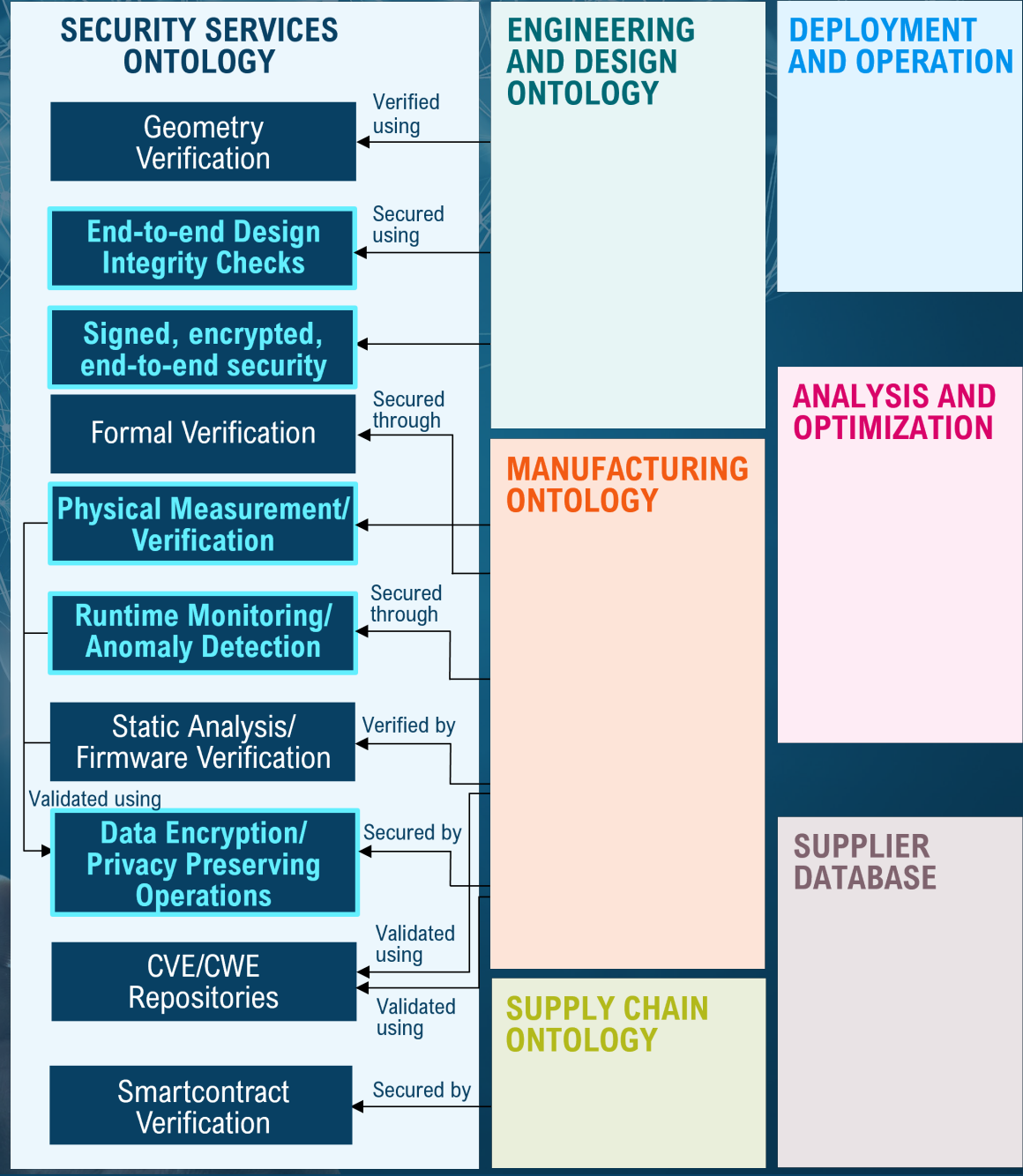
CyManII's Expansive Membership Network

Clemson University
DRAGOS
Michigan State University
OMNIGENCE
EPIcenter
The Composites iacmi Institute
ILLINOIS
CISCO
REMADE INSTITUTE
SIEMENS
MTConnect
INDIANA UNIVERSITY
ptc
NCMS National Center for Manufacturing Sciences
INL Idaho National Laboratory 70 YEARS OF SCIENCE & INNOVATION
PORT SAN ANTONIO
TRIDENT TECHNICAL COLLEGE
University of Nebraska Lincoln
CACI EVER VIGILANT
NETRISE
BOISE STATE UNIVERSITY
UCDAVIS
UCI University of California, Irvine
RUTGERS
MITRE
AUTODESK
DYNICS
hp
VCU
University of New Hampshire
University of Pittsburgh
OAK RIDGE National Laboratory
TEXAS The University of Texas at Austin
EPRI ELECTRIC POWER RESEARCH INSTITUTE
PURDUE UNIVERSITY
ingevity
GE
VERACITY
UNIVERSITY OF TEXAS ARLINGTON
VIRGINIA TECH
THE ASSOCIATION FOR MANUFACTURING TECHNOLOGY
Sandia National Laboratories
THE UNIVERSITY OF TENNESSEE
CESMII THE SMART MANUFACTURING INSTITUTE
GEORGE MASON UNIVERSITY
UT DALLAS
MISI Maryland Innovation & Security Institute
CNF TECHNOLOGIES CYBER NET FORCE
UTSA
THE UNIVERSITY OF TEXAS AT EL PASO
M D The Digital Manufacturing Institute
NEXIGHT GROUP
Mazak
TEXAS TECH UNIVERSITY
ABB
Cynalytica
The UNIVERSITY of OKLAHOMA
THE UNIVERSITY of TEXAS SYSTEM FOURTEEN INSTITUTIONS. UNLIMITED POSSIBILITIES.
LOCKHEED MARTIN
Carnegie Mellon University
ASME SETTING THE STANDARD
ISA

Cyber-Physical Passports

- Digital objects that store structured information across cyber-physical layers
- Provide support for certification, compliance, and compatibility
- Provide provenance across supply chain networks
- Provide verification of security



Problem Statement

A Boeing 747-8 comprises of **6 million parts.**

Manufacturers need a system that provides:

- **Provenance:** tracking the manufacturing parts across the supply chain from design to final product
- **Verification:** verifying at every stage that the integrity of the part is not altered

Manufacturers do not have systems that can track part quality and integrity, and supply chain security and productivity

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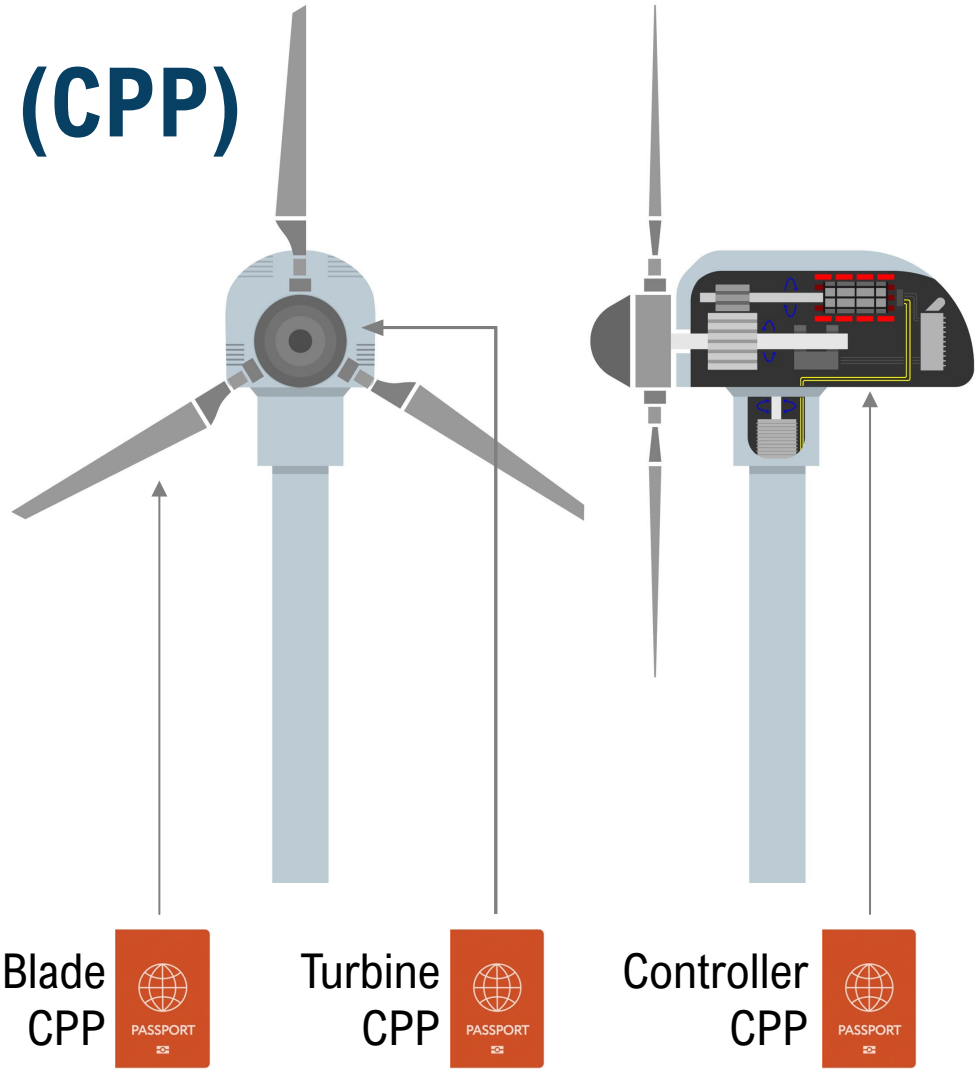
Solution: Cyber-Physical Passport (CPP)

A digital representation of a physical process or artifact, along with all of its dependencies.

Provide certified immutable records of all manufacturing entities, processes, artifacts, and products.

A CPP for a part instance is a digital object that contains all data associated with its manufacture

(CNC machine, dimensions, material properties, links to CPPs for designer, design software, design compiler, etc.)



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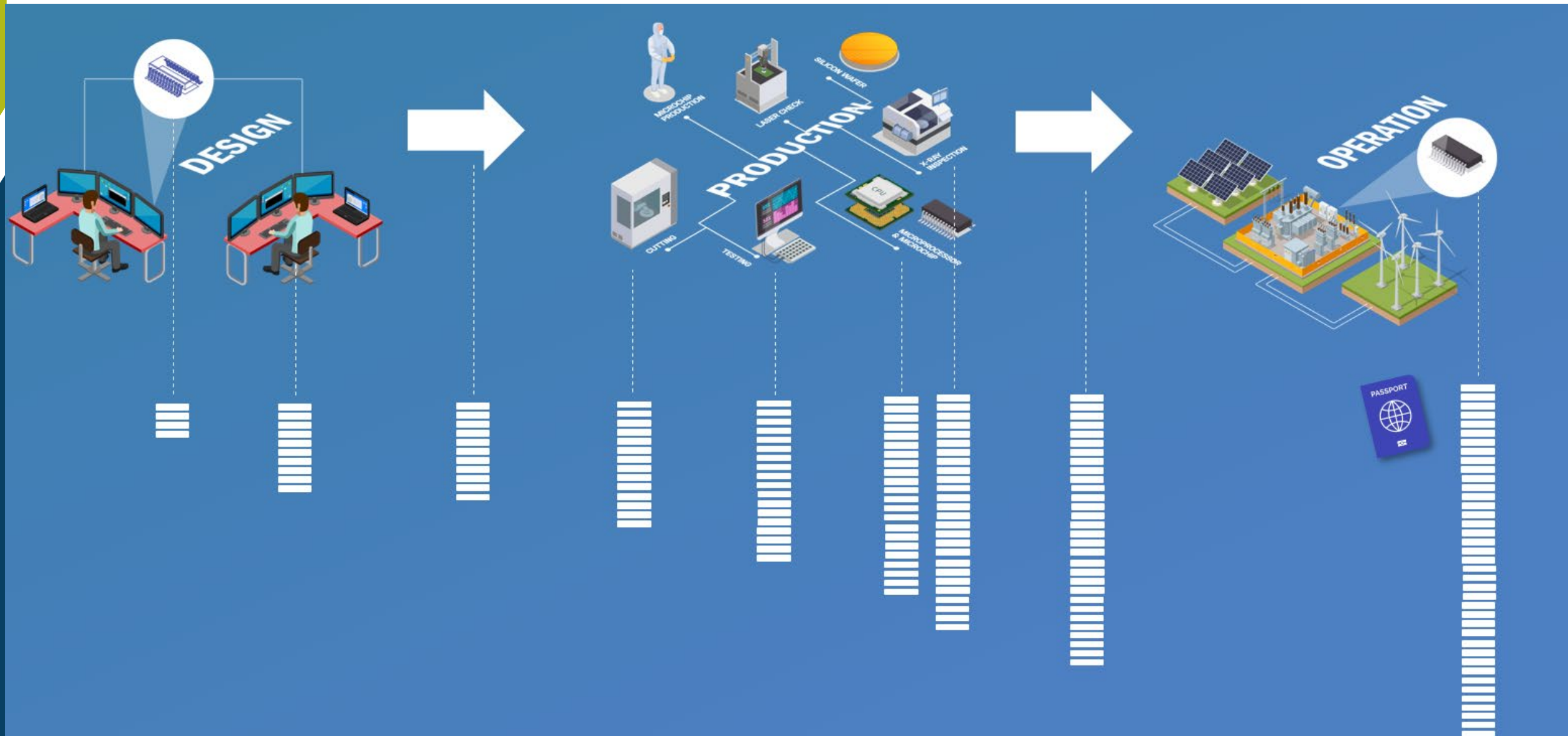
The CPP Follows a Product Along its Lifecycle.



Validation

Currently testing the framework with industrial partners

Small businesses:

Humtown, Neuvokas, Addiguru, Authentise

Humtown
Always innovating.

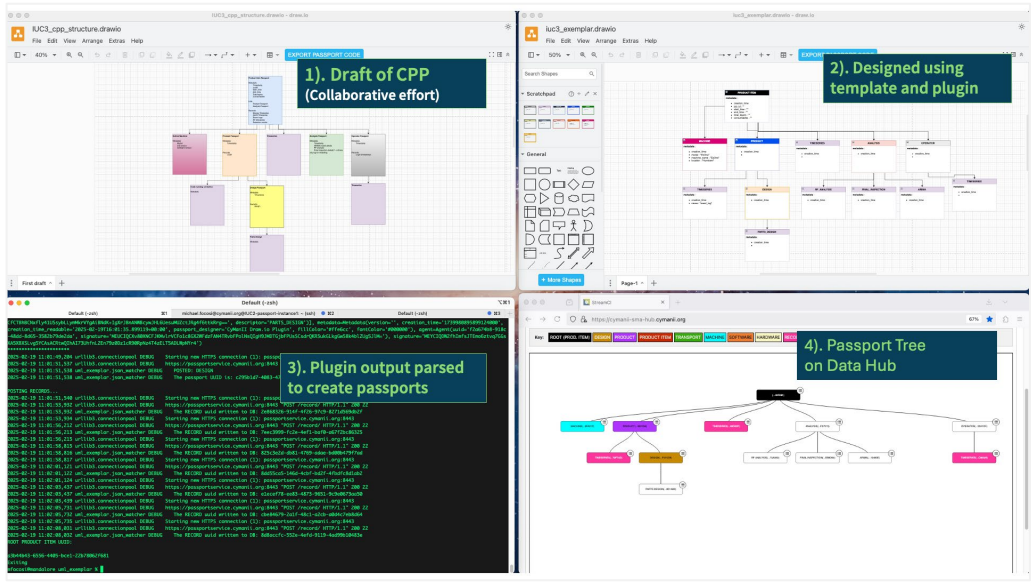
NEUVOKAS™

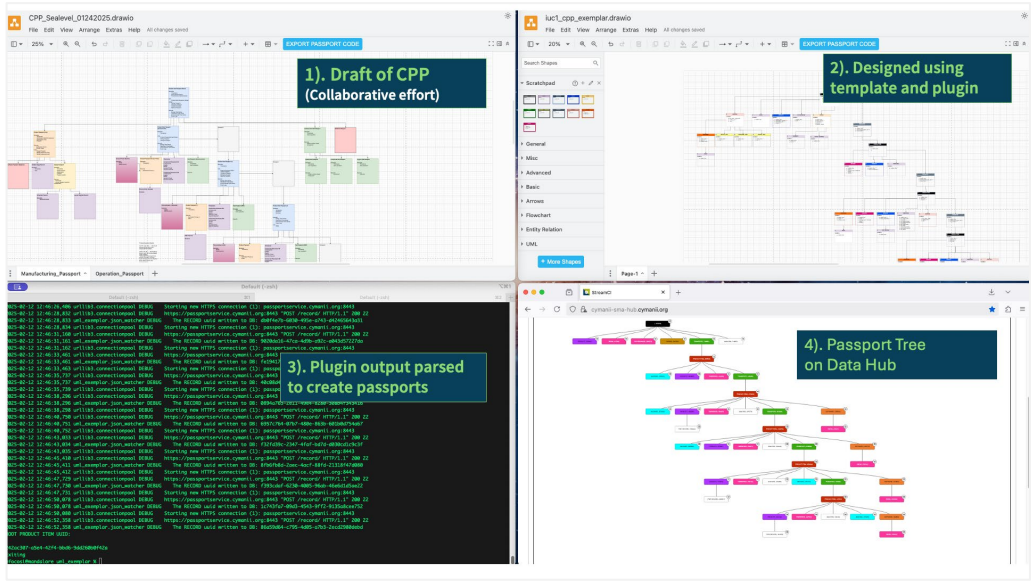
ADDIGURU

AUTHENTISE

OEM:

GE Vernova





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Thank You!

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https://cymanii.org/why-join/


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