2024 March Company Member Forum

March 21, 2024

Day 1

8:00am – 4:00pm CST

Welcome and Opening Items

- **Alan Manche**, Vice President, External Affairs – Schneider Electric, ANSI CMF Chair

- **Joe Bhatia**, President and CEO – American National Standards Institute (ANSI)

Company Member Forum
Housekeeping Items

- Please display your name and affiliation on Zoom.
- All attendees are automatically muted on entry. You have the ability to unmute yourself, however we ask that you please remain muted at all times, unless you have requested permission to speak. This will greatly reduce any background noise.
    - To request permission to speak during the meeting, please type **"SPEAK"** in all caps in the general chat box. We have designated staff that will be closely monitoring the chat, and controlling the queue to speak throughout the meeting. The "raise hand" feature will not be used during this meeting.
    - The **"raise hand" feature will not be used** during this meeting.
    - When speaking, please introduce yourself with your name and affiliation.
- You can also use the chat to ask questions and make comments throughout the meeting, if you do not wish to speak.
    - Please note that if you call in without connecting to the Zoom, you will not be able to use the chat function.
- This meeting is being recorded for note taking purposes. The presentation and meeting summation will be available post event.

ANSI Committee on Education Update

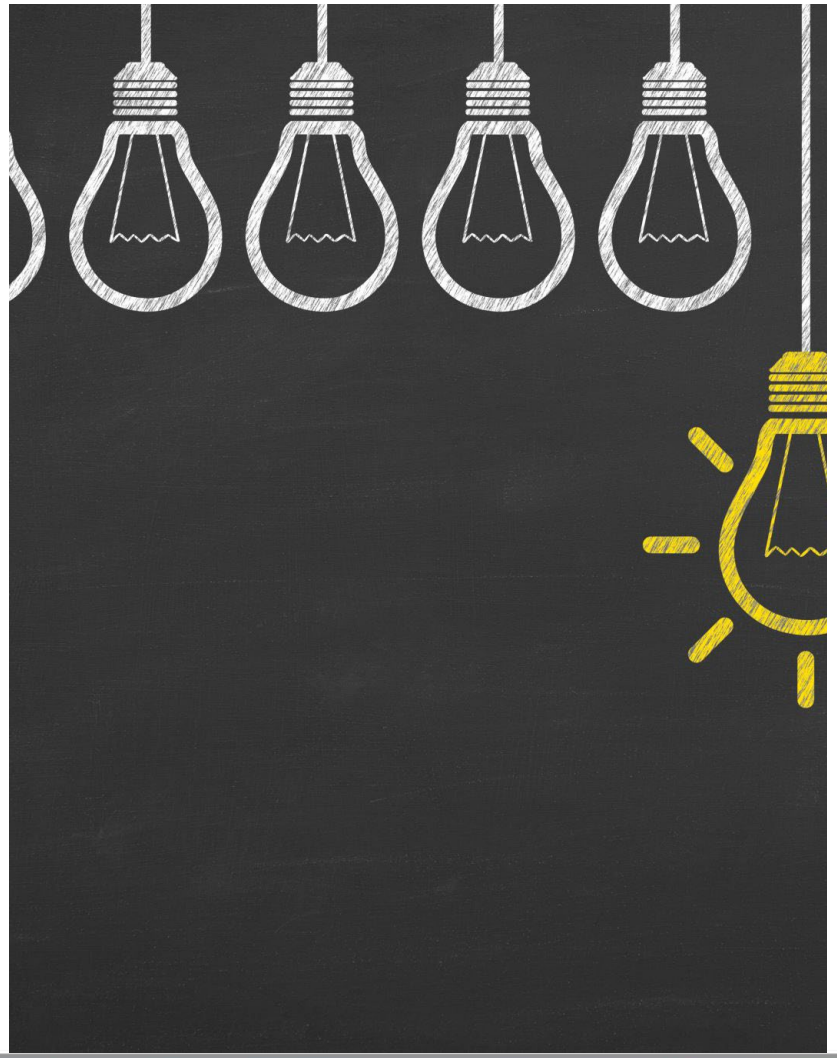
- A brief update on the activities of ANSI Committee on Education (CoE) and how ANSI CMF can contribute

- **Muhammad Ali,** Senior Standards Strategy and Policy Leader – HP, Inc., ANSI Committee on Education Chair

ANSI Committee on Education (CoE)

March 2024 ANSI CMF Meeting

Committee Charter



- Oversight of all Institute initiatives related to standards and conformity assessment education and outreach, including:
  - Long term strategy for university faculty outreach to promote the integration of standards and conformity assessment in curricula to educate the next generation of business leaders on the strategic impact of standards and conformity assessment.
  - Programs and tactics that raise awareness of the importance of standards and conformity assessment among university faculty and across multiple disciplines

Leadership and Membership

- Currently more than 70 committee members representing SDOs, companies, government agencies and academic institutions
- 2024 Leadership
  - Muhammad Ali, Chair (HP, Inc)
  - Tracy Lendi, Co-Vice Chair (International Code Council)
  - Ed Manns, Co-Vice Chair (ISA)
  - Dennis Duncan, Co-Vice Chair (Nokia)
  - Lisa Rajchel, Staff Liaison (ANSI)

2024 Student Paper Competition

- Theme: What role do, or could standards play in safe and effective implementation of AI applications/systems?
- Deadline: June 07, 2024

Standards Simulation

- ANSI CoE had no standards simulation in 2023.
- We are looking for sponsors to fund more simulations, either in its entirety or partial funding.
- We are hoping to do an in-person simulation in conjunction with the fall CoE meeting, pending funding.
- ANSI CoE is also exploring an option to design standards simulation within ANSI CoE.

CoE Meetings at Universities

- ANSI CoE hosted its October 2023 meeting at George Mason University along with the following interactive events for Students:
  - Meet and Greet Session in the Evening on First Day
  - Standards 101 Course with a follow up Jeopardy Game for Students
  - Create a Peanut Butter Jelly Sandwich Standard
- The events were well attended by Students.
- With the success at October 2023 meeting, ANSI CoE has decided to host its annual 1.5 day in person meeting at a university

CONNECT YOUR CLASSROOM WITH A STANDARDS EXPERT!

Resources

- https://www.ansi.org/education/activities/standards-student-programs
- For Students
  - Internships
  - Free e-learning courses
  - Simulations/workshops
  - Paper Competition
- For professors:
  - Membership on Committee of Education
  - Networking opportunities
  - Access to ISO and IEC standards for use in the classroom (University Outreach)
  - Free e-learning courses
  - Standardization case studies
  - Guest lecturers

Contact Information

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ANSI
American National Standards Institute

Update on E-Labeling

- Chair of ITI Regulatory Policy Committee is going to provide a brief update on developments on E-labeling and associated standards.

- **David Ling**, Regulatory Strategist, Distinguished Technologist – HP Enterprises

Update and Live Q and A: Government Policy and Legislative Updates

- ANSI staff will provide an update on current legislative and regulatory initiatives and government-led policy dialogues. Items such as recent US-EU TTC Meeting Outcomes, implementation of the US Government National Standards Strategy for CET, and any legislative bills related to Standards are going to be covered.

- **Mary Saunders**, Senior Vice President, Government Relations and Public Policy – ANSI

Government Policy and Legislative Updates

ANSI Company Member Forum Meeting

March 21, 2024

Outline

- US-EU Trade and Technology Council Update
- Related Events of Note
- USG NSSCET Implementation Plan Timeline
- ANSI Evolving Standards Landscape Effort
- Legislative Items of Interest

US-EU Trade and Technology Council

- Fifth Ministerial Meeting (30-31 January 2024) – areas of agreement
  - **Boost trade in green technologies**: continue to explore ways to facilitate trade in goods and technologies that are vital for the green transition, including by strengthening cooperation on conformity assessment
  - **Digital technologies**: make tangible progress on digital trade tools to reduce the red tape for companies across the Atlantic and to strengthen approaches to investment screening, export controls, outbound investment, and dual-use innovation
  - **Critical raw materials**: intensify coordination on the availability of critical raw materials crucial for semiconductor production
- Sixth Ministerial Meeting – April 4-5, 2024 in Belgium
- Current EU Commission ends it mandate on October 31

Related Events of Note

- Transatlantic Initiative on Sustainable Trade
  - Launched at the third U.S.-EU TTC Ministerial meeting (TTC3)
  - TIST work program agreed at TTC4, building on current workstreams in various TTC working groups and launching a set of additional projects
  - Stakeholder event held in D.C. January 30-31, 2024
  - Additional deliverables presented at TTC5

- ANSI Roundtable on the proposed EU Digital Product Passport
  - Solicited input on possible areas of cooperation between the US and EU that align with US private sector priorities
  - Attended by over 65 private and public sector representatives

USG NSSCET: Timeline

- May 4, 2023: Strategy launched at White House event
- May 2023: NIST formed a VCAT subcommittee on International Standards Development
  - NSSCET feedback, recommendations for NIST
  - Report adopted by the VCAT on February 14, 2024
- September 7: RFI published
  - NIST requested information on behalf of the U.S. Department of Commerce and the U.S. Government to support the development of an implementation plan
- September 5, 2023 – January 26, 2024
  - 13 listening sessions held; 3 sessions hosted or co-hosted by ANSI
- January – April 2024: Development of draft implementation plan

Preliminary Findings – VCAT Subcommittee

USSCET Feedback	Overall supportive	Overreach cautions	Consortia inclusion	OSS inclusion
U.S. Leadership	Standards system vs. individual SSO	Protect & promote democratic principles in good governance	International community engagement	
Blockers	SME challenges	Hosting challenges	Long-term executive support	
Pre-standardization	Best opportunity for proactive impact	Numerous existing efforts for collaboration		
Measurement	Most essential need, least understood path forward	Outcomes-based, avoid simplistic context		
Workforce development	Executive sponsorship challenge	University vs. mid-career training	Recognition and career challenges	

NIST Key Takeaways for USG

- Continue active participation as a stakeholder – additional coordination is needed
- Support and promote the integrity of the international standards system in g-to-g interactions. Align with TBT principles.
- Engage a wider range of market participants
  - NIST, with other agencies, is planning a workshop later this year to convene civil society representatives
- Engage more effectively with the academic community
- Public-private partnerships are key – need to identify best practices
- Barriers:
  - Gap in understanding and communication between the policy and technical levels in some agencies (negative impact on R&D investment)
  - Access to standards and standards development activities – is there a role for the USG in supporting increased access?

Evolving Standards Landscape - Background

- A final consolidated report of ANSI Board Focus Group recommendations was delivered to the ANSI Board in August 2023.
- In addition to targeted recommendations for ANSI, Focus Group leads identified an overarching, comprehensive recommendation related to the evolving standards landscape, noting that:

"There is a pressing need for sustained attention and engagement on the evolving standards landscape challenges by ANSI and the broader standards community. In particular, immediate action is needed to address the effects of the politicization of standards and related standards processes, and to halt the undermining of confidence in technical standards activities."

Overarching Recommendation: Launch institute-wide campaign to educate and raise awareness about urgent challenges to the system due to the increasing politicization of standards and inform stakeholders about how to partner with ANSI and the standards community to address concerns.

Actions Underway

- Reshaping messaging – rather than continuing to use "**politicization**" as an umbrella term, speak to the specific examples of increasing gov/policy interest in standards
- Enhancing private-public cooperation/information sharing - highlight working examples of PPP
- Incorporating relevant high-level messaging on the importance of private-sector-led standardization activities in ANSI 101 pieces and new ansi.org web features
- Reviewing training programs for update; cross-leveraging education/training materials across departments where possible

Upcoming Opportunities

- More member roundtables on priority issues
- Online workshops with consortia on broad issues of shared interest
- New ansi.org features/sections
  - Impact of standards on business, sustainability, innovation
- Focused, in person training for federal agency staff
- WSW 2024

Legislative Items of Interest

- U.S. Standards Leadership Act of 2024
  - The bill aims to improve visibility into standards setting related to emerging technologies and increase U.S. participation in these critical activities
  - Focuses on standards development for AI and other Critical and Emerging Technologies (CETs)
  - Tasks NIST to:
    i. provide a report on US participation,
    ii. create a web portal to help stakeholders engage, and
    iii. establish a grant program to supporting hosting standards meetings in the U.S.

Contact Information

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Update and Live Q and A: International Activities

- ANSI staff will provide an update on EU Standards and TBT issues (Trade and Technology Council), plans for the annual Korea-U.S. Standards Dialogue and Open Forum, and related ANSI interactions.

- **Joseph Tretler Jr.,** Senior Vice President, International Policy – ANSI

Update and Q&A: International Activities

Joseph Tretler Jr., Vice President, International Policy

March 21, 2024

Assessment of EU Regulation 1025/2012

- ANSI provided comments on the regulation highlighting the potential impact that it can have on standards development.

- Regulation 1025/2012 considers only ISO, IEC and ITU to be “international standardization bod[ies]”. This definition should be expanded to include international standardization organizations that develop their deliverables according to the WTO TBT principles.

- The comments also offered suggestions to the EC around the need for the Regulation to account for more flexibility on standards development.

Proposed Digital Product Passport (DPP)

- ANSI is getting more involved in working with the EC to help shape this EU initiative in a way that is aligned with the U.S. private sector priorities. The areas of emphasis that remain open for discussion are:
  - Scope (application level),
  - Technology (storage, carrier, and access),
  - Data (data requirements and governance)

- ANSI aims to keep conveying to the EU the intellectual property concerns that the private sector has over the DPP.

- The EC has proposed that the DPP be discussed within the U.S.-E.U. Trade and Technology Council (TTC) framework, with respect to the standards, conformity assessment, and market access aspects.

Takeaways from TTC summits 4 & 5

- The TTC held summits in May 2023 and January 2024. The green transition and standard around A.I have been at the forefront of both summits with key policy goals framed under the TIST.

- Despite these summits private sector stakeholders have mentioned a disconnect between the consultation process and the TTC outcomes. ANSI remains engaged where possible, and encourages both governments to increase stakeholder consultation.

- The next TTC summit is set to be in Brussels on April 4 2024, registrations for a livestream of the event can be found here.

2024 US-Korea Standards Forum

- Hybrid meeting to be held in June
- Open to CMF members, in-person participation in Washington D.C.
- Currently recruiting session leaders
- Audience registration to open by May

- The event will focus on several strategic sectors including:
  - Digital Identity
  - Next Generation Mobility
  - Semiconductor
  - Wind Power
  - AI
  - Blockchain
  - Carbon Neutrality
  - Quantum Technology

Contact Information- International Development team

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Coffee Break
Ends: 10:55 am CST

Panel Session: Navigating the Future: Risk Management Standards and GenAI

- Generative artificial intelligence (AI) refers to the technology that generates text, pictures, sounds, videos, codes, etc. based on algorithms, AI models and rules. There are also inherent risks with GenAI applications and some of these risks include misinformation, hallucinations, bias, security and privacy and others. This panel session is going to explore the relevant standardization activities in artificial intelligence and specifically GenAI.

- **Mariel Acosta-Geraldino**, Program Manager, Product Safety, Telecom and Radio – IBM
- **Dan Tecuci**, Ph.D., Senior Director of AI – SparkCognition
- **Haniyeh Mahmoudian**, Ph.D., Data Robot – Global AI Ethicist
- **Niklas Johnsson**, Director of Data Science Generative AI – HP, Inc.

Brain Computer Interface

- A BCI is a technology that establishes a direct communication pathway between the brain and an external device or computer. BCIs can be used for various purposes, including medical applications, assistive technologies, and enhancing human-computer interactions. This TEDtalk style presentation is going to provide an overview of the technology and the standardization needs around it.

- **John Strassner**, Ph.D., CTO, Americas Standards and Industry Group – Futurewei Technologies

Networking Lunch and HP Tour

- Lunch *12:00pm – 12:30pm*

- *Value of Standardization to HP, Inc. 12:15pm – 12:30pm*
- **Gabriel Valencia**, Power Architecture Engineering Manager – HP, Inc.

- Welcome to HP Tour *12:30pm – 1:30 pm*

- Transition Time *1:30pm – 1:45pm*

ANSI CMF at HP Inc

BAPCo

Business Personal Systems, Power Architecture Team

Gabriel Valencia

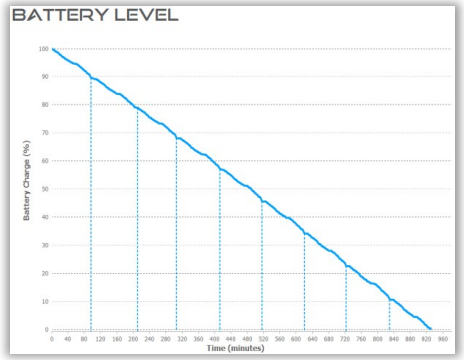
What is BAPCo?

What is BAPCo?

- Business Applications Performance Corporation
- A consortium of members from Acer, ASUS, Compal, Dell, Dynabook, HP Inc, Intel, Lenovo, Samsung, Western Digital and others

Online, public dashboards

https://results.bapco.com/dashboard



SysMark

Measures & compares **system performance** using real-world applications & workloads

Featuring new Office applications, general productivity, photo editing, advanced content creation, web browsing, file compression

MobileMark

Application-based, performance-qualified **battery life benchmark**

Features use of spreadsheets, word processing, OCR, email, file encryption & compression, web browsing, photo editing, video playback and more.

CrossMark

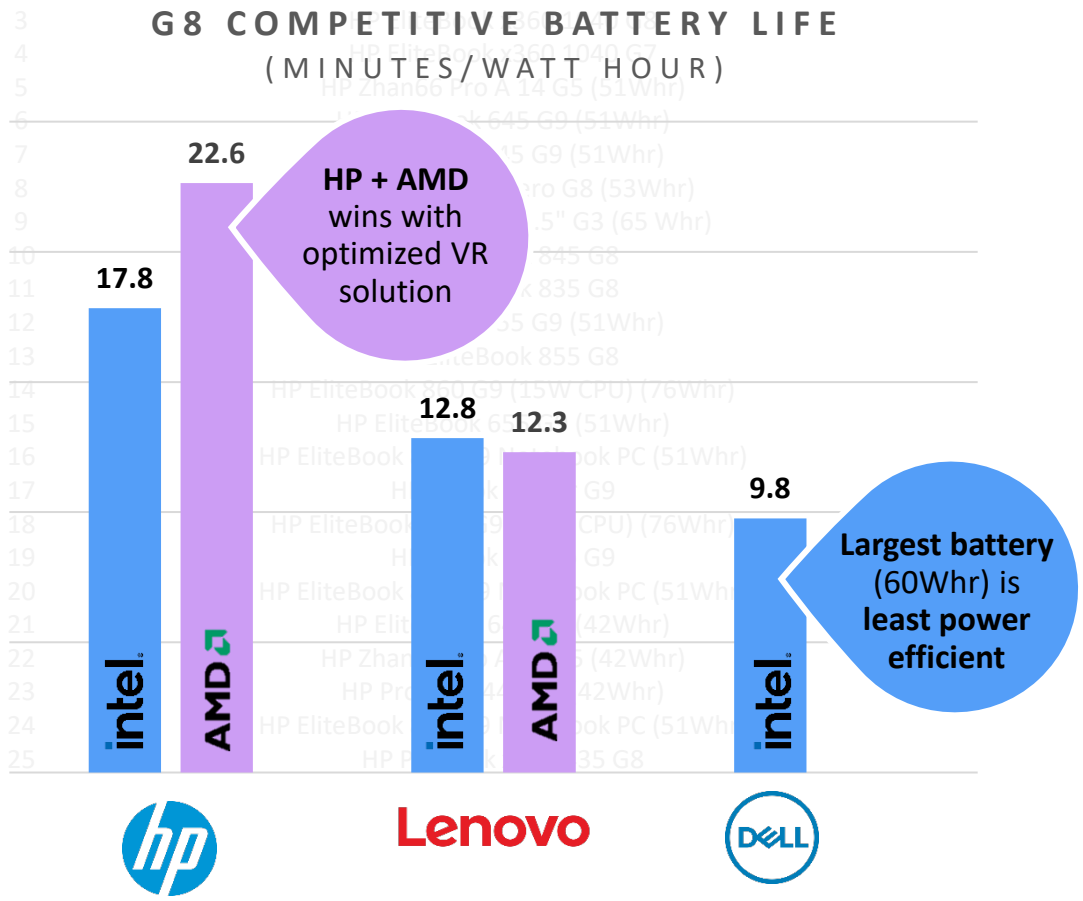
Overall system performance and responsiveness using models of real-world applications

HP Battery Life in a Hybrid Workstyle

- **HP is top 9 of 10 MM25** excluding systems configured with dual battery
- **10 of TOP 20 are HP Products** on the BAPCo MobileMark 2018 Leaderboard
- HP has been leading since G7
- How are we winning? **HP IP** with voltage regulator supplier **+ HP/AMD** partnership optimizing power efficiency

HP Zbook Power G10

- ✓ **#1 on BAPCo MM25 Leaderboard for single battery**
- ✓ ~20 hrs battery life
- ✓ 83Whr battery
- ✓ AMD Ryzen 7 7840HS



https://results.bapco.com/results/benchmark/MobileMark_2018
https://results.bapco.com/results/benchmark/MobileMark_25

- NOTE: Live Leaderboard snapshot taken on 10/16/2023

HP Inc. Welcome Opening Keynote: Standardization and Intellectual Property

- **Chandrakant Patel**, HP Chief Engineer and Senior Fellow – HP, Inc.

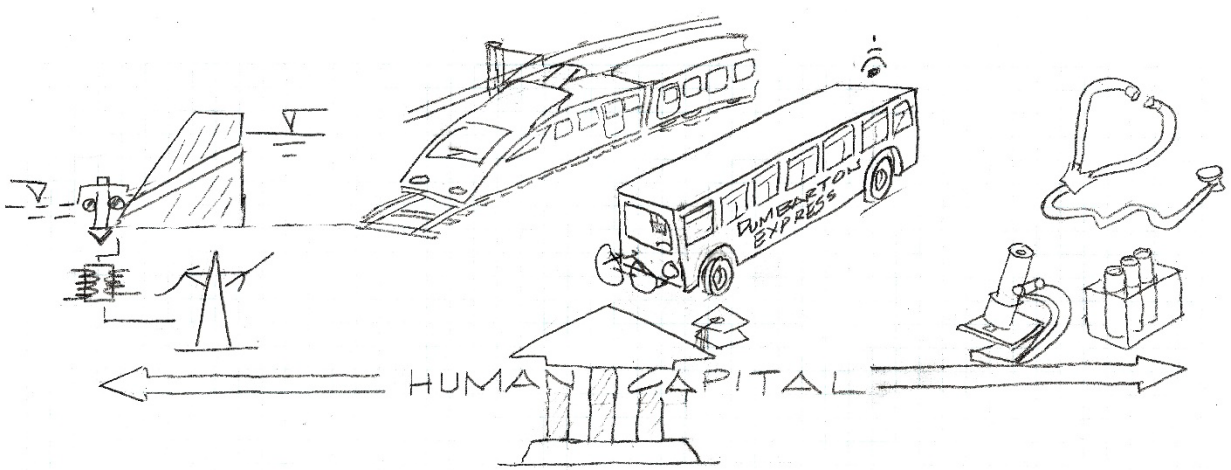
The Age of AI

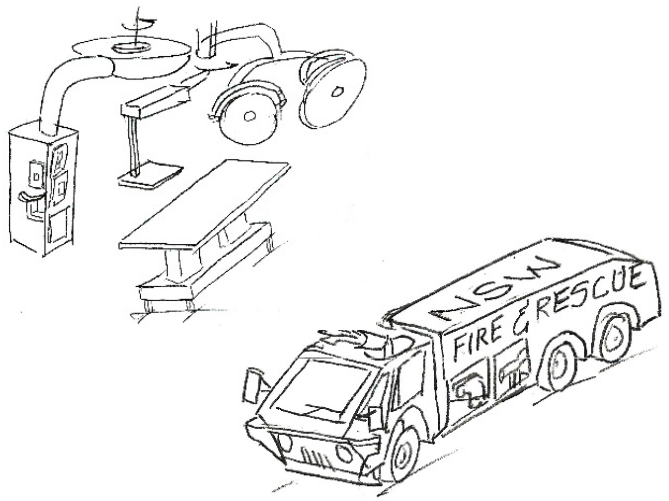
driven by the rise of cyber physical systems

Chandrakant D. Patel

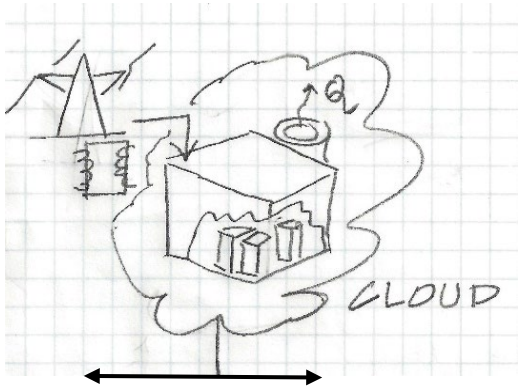
HP Chief Engineer and Senior Fellow

Gaps between supply and demand are drivers of Cyber-Physical Systems

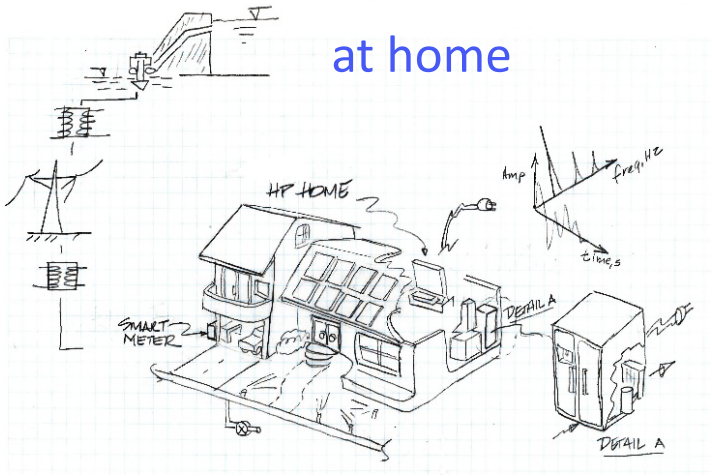




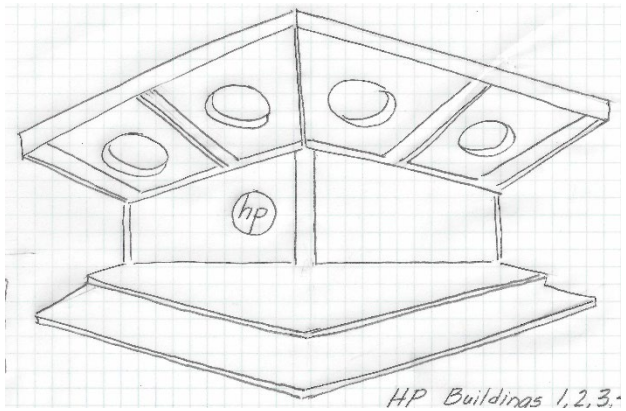
Supply Side



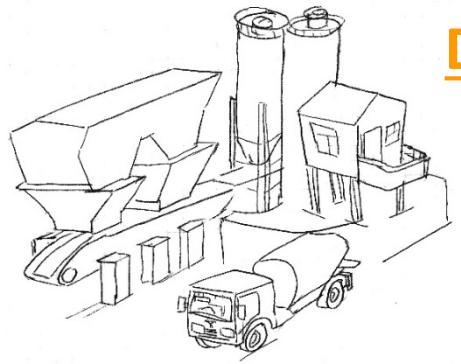
Social, Economic, Ecological Trends



On the Go



at the work site

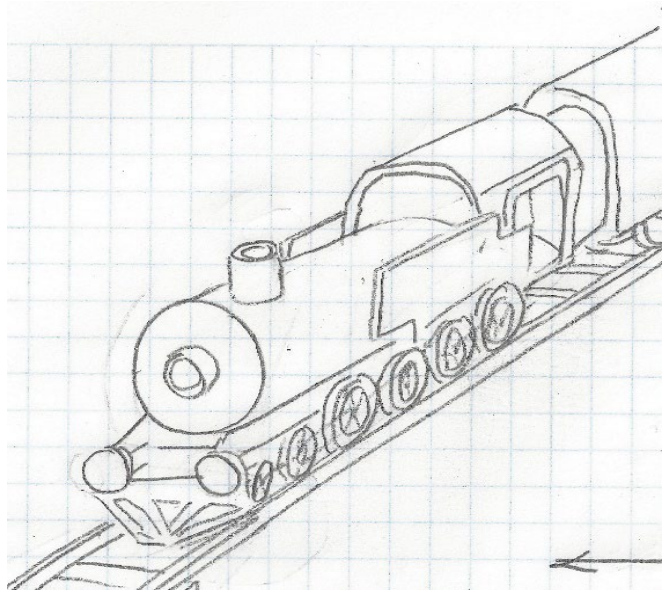


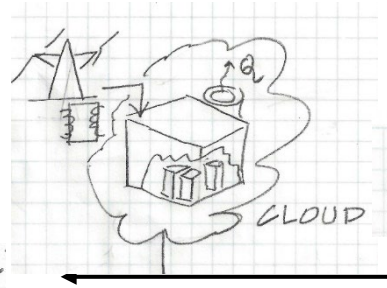
Demand Side

Basic Needs

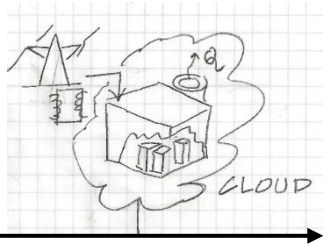
References: Patel and Baveja, "Rise of Cyber Physical Systems", National Academies of Engineering, 2023

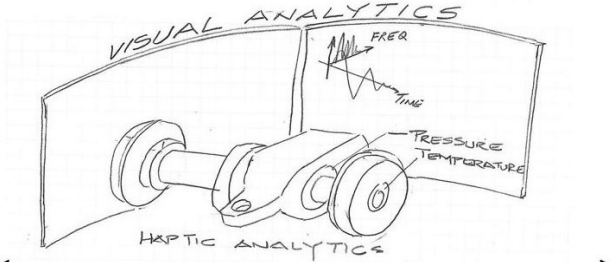
The Rise of Cyber-Physical Systems

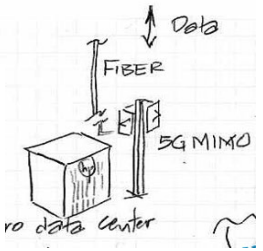


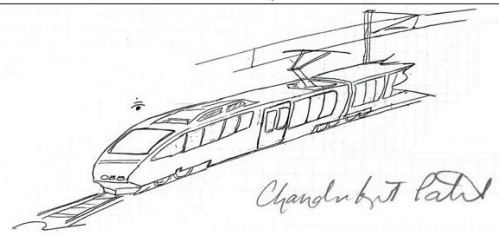


People and Organization Generated Data









Machine Generated Data

Machine (Physical) Age
19th Century

DOMAIN

Information (Cyber) Age
20th Century

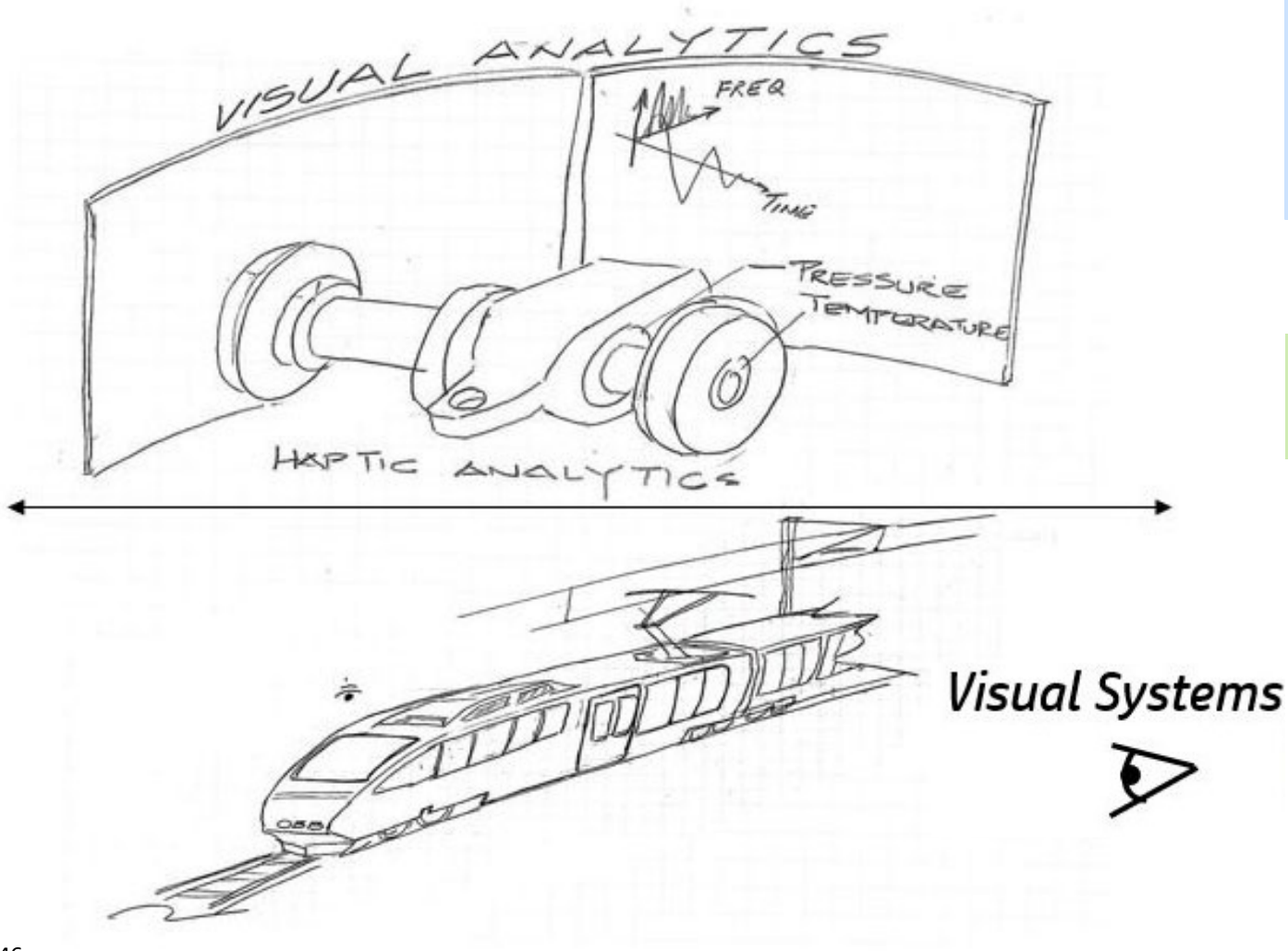
DATA

Cyber Physical Age
21st Century

DOMAIN+DATA

Broad AI

domain knowledge, robust data, patterns, predictions, actions



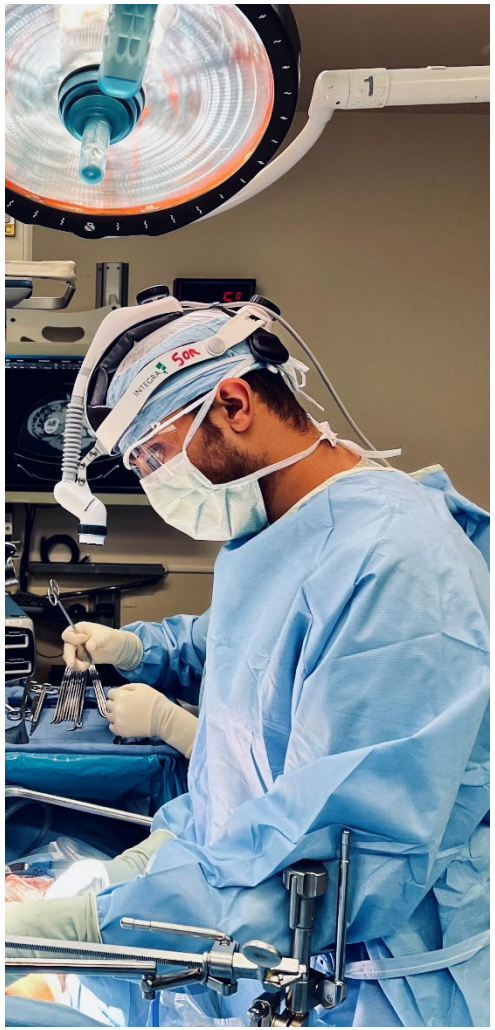
Immersive Operations Center to assist a few to manage and maintain complex systems

Software Development aided greatly by Co-Pilots

Petabyte scale machine generated structured and unstructured data

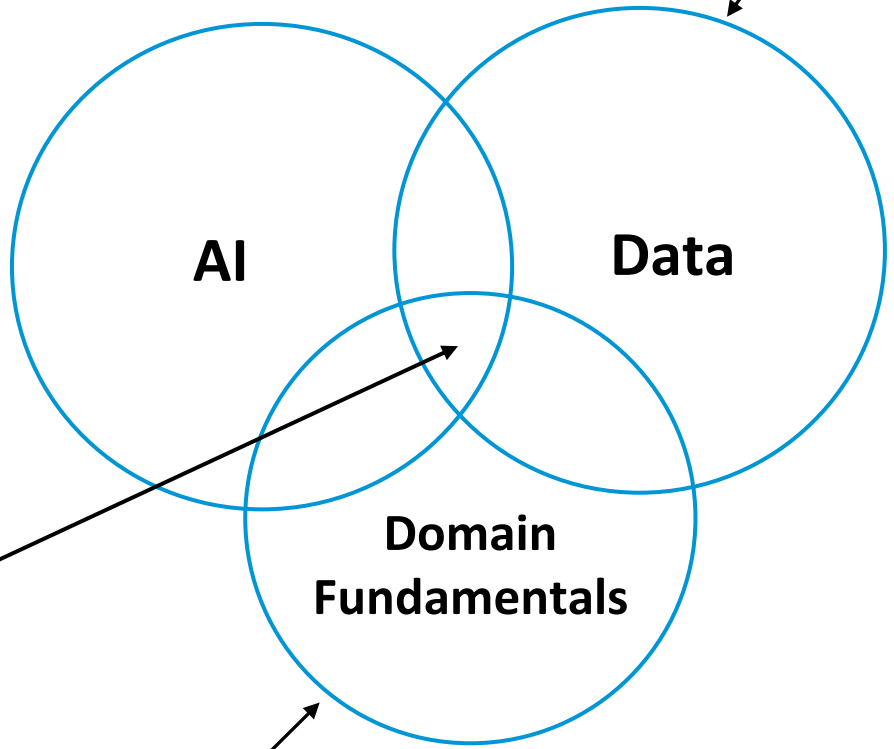
Pressure, Pa
Temperature, ^{o}C
Frequency, Hz
Mode Shape

Domain Generative AI as a Medical Advisor



1. Pre-Trained Model on Public Data
2. + Sector Data
3. + Private Data
4. + Clinical Domain Knowledge

Sector Data, Private Data & Public Data



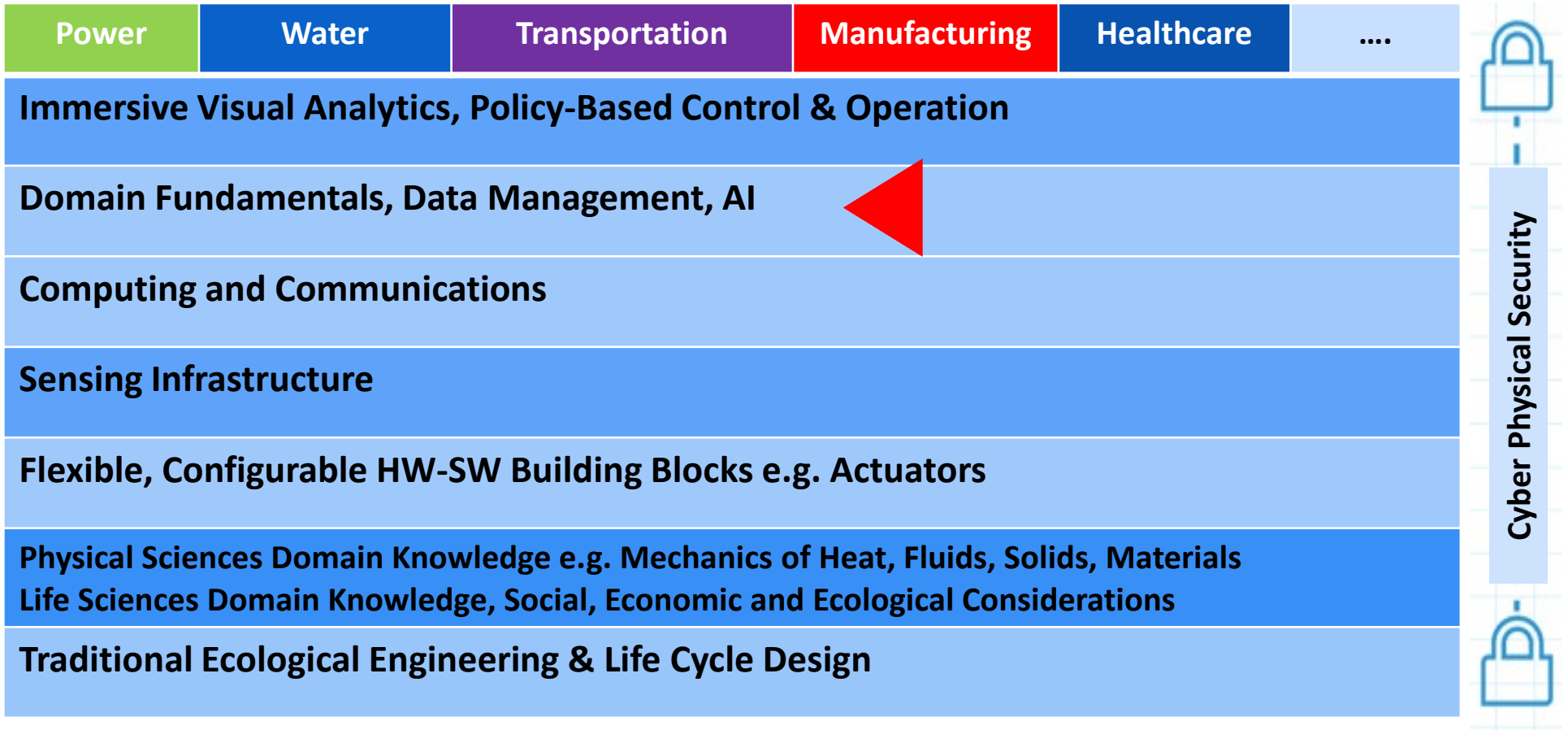
Gen AI Tools

e.g. Surgery Advisor

- *Pre-operation*
- *During operation*
- *Post operation*

Education and Clinical Training in sub-specialized fields

City Cyber Physical Stack



- Domain Fundamentals
- IT Infrastructure and Data Management
- AI

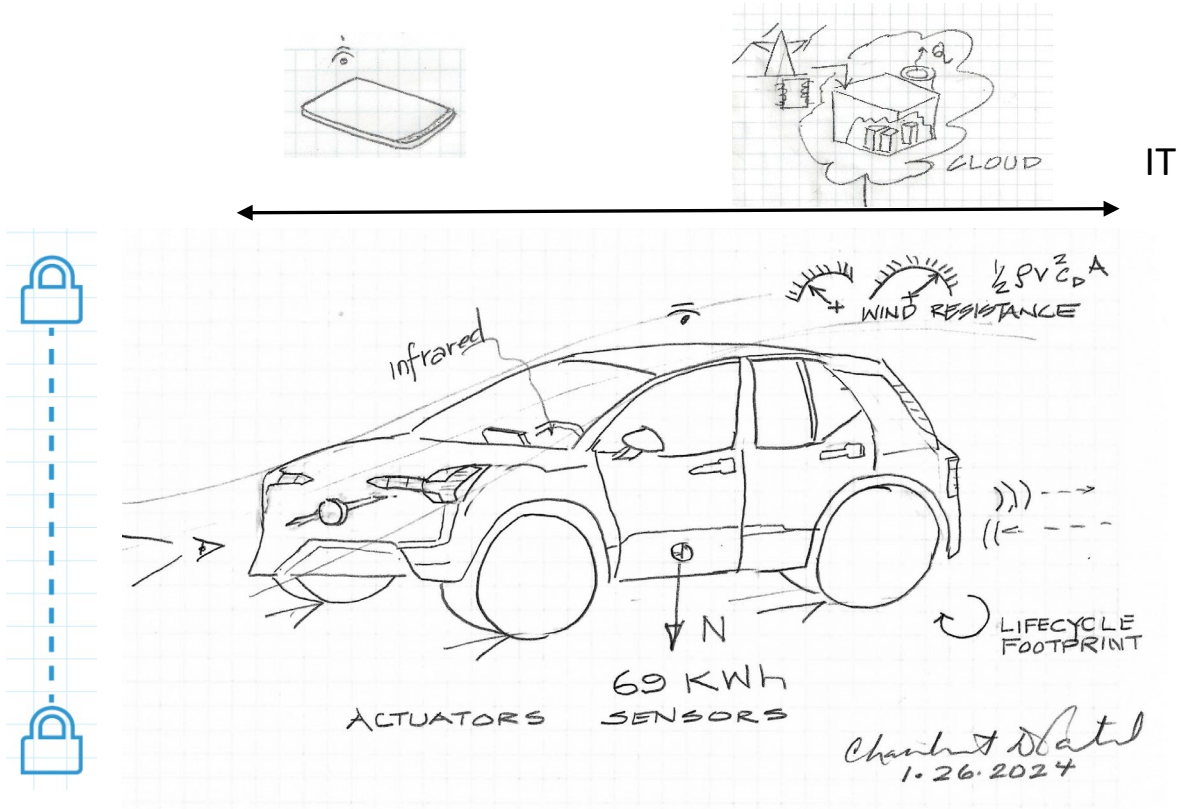
References:

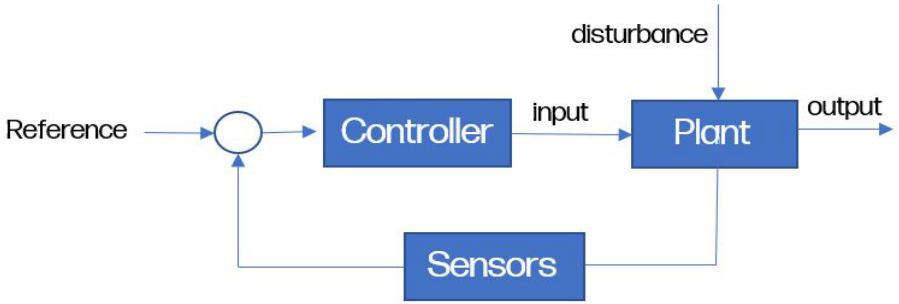
Patel, Lee, George, "A Holistic Fundamentals-Based Supply-Demand Framework for Sustainability ", HP Inc Technical Report, 2022
Patel, "Sustainable Ecosystems: Enabled by Supply and Demand Management" , ICDCN 2011
Bash, Hogade, Milojicic, Patel "IT for Sustainable Cities: A Framework for Resource Management and a Call for Action", Bridge, National Academy of Engineering, 2023

The Conversation Shifts:

- Cyber Stack to Cyber- Physical Stack
- Cloud Computing to the Source of Data

Cyber Physical Stack





Operational Technologies (OT)

IT

- Historical Data Mining, Thousands of Vehicles Motif Mining
- Closed Loop Policy Based Control Systems
- Knowledge Discovery (AI/Machine Learning) Inference, Visual Analytics
- Machine Generated Data Management (rich data, context)
- Computing and Communications (onboard, cloud)

- Rich Sensing: LIDAR, RADAR, structured data
- Flexible Configurable HW-SW Building Blocks - actuators, motor control
- Physical Sciences Domain Knowledge Dynamics of Solids, Fluids, Heat, Chemical
- Sustainability: Least Lifetime Energy

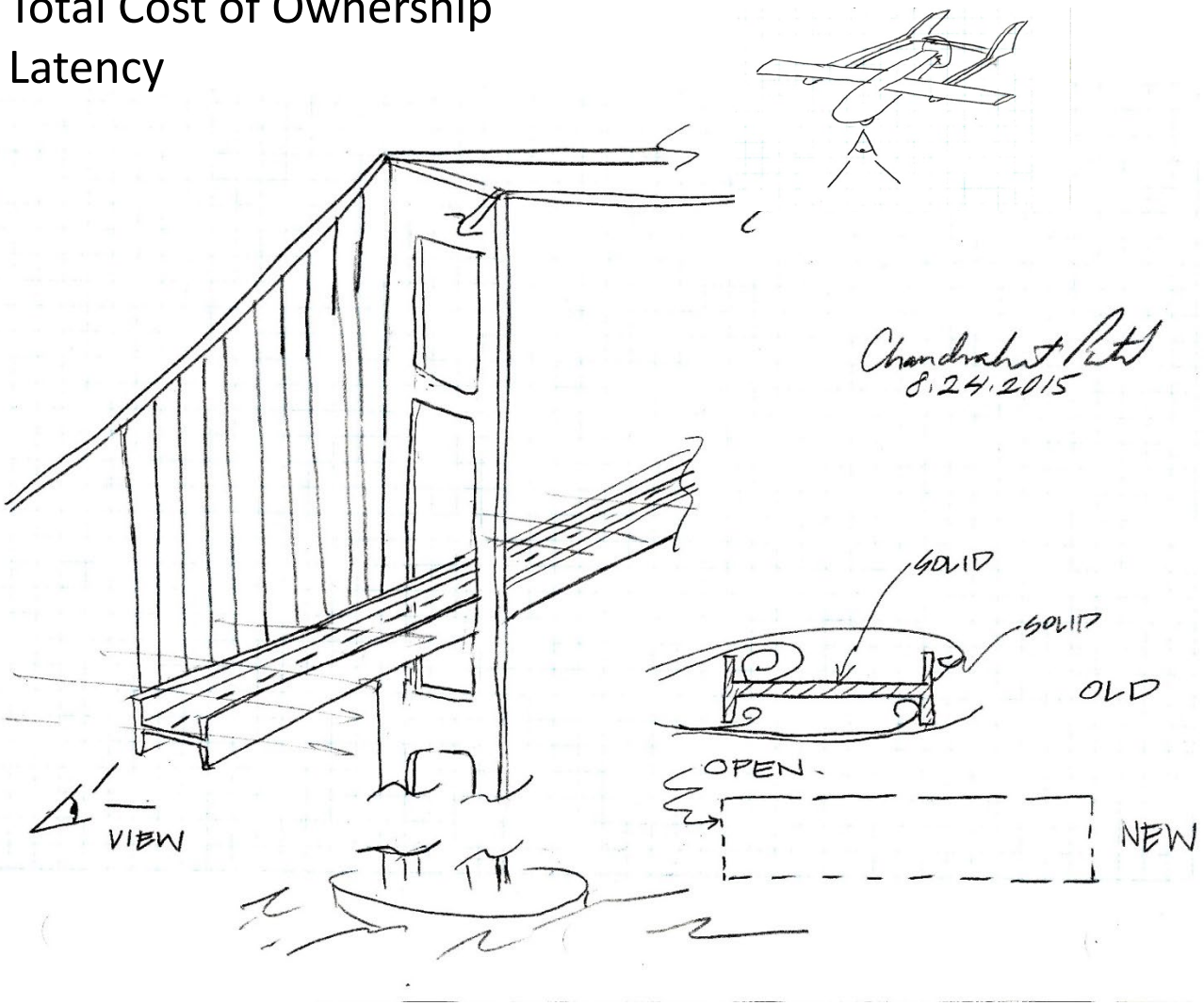
DATA

Cyber Physical Security

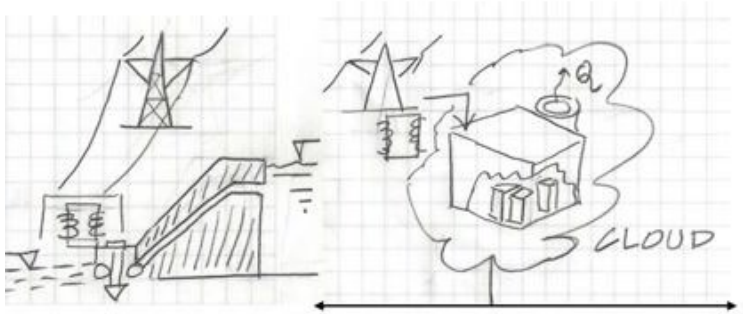
Computing Paradigm in the Age of AI

zettabytes of *machine generated data (domain understanding), analysis in real time, total cost of ownership)*

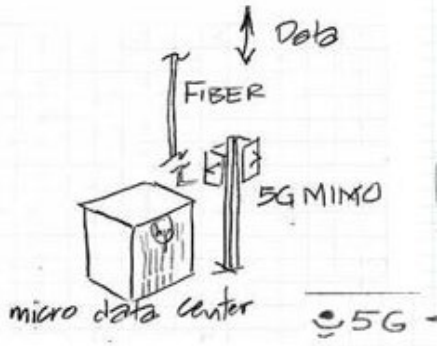
- Total Cost of Ownership
- Latency



Cloud



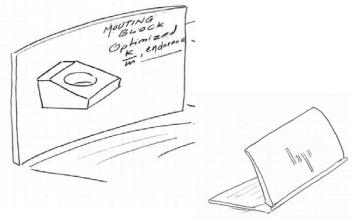
Edge



Visual Systems

Extreme Edge

- Amplitude
- Frequency
- Mode Shape e.g. Torsional Mode of Vibration
- Wind Velocity
- Occupancy/Loading



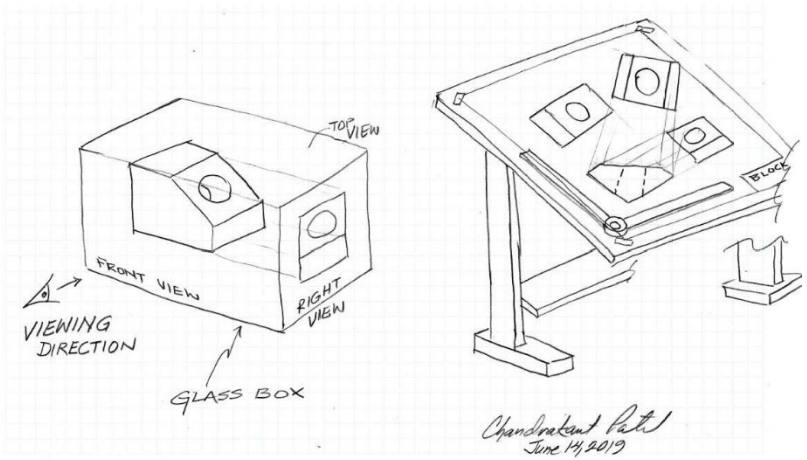
Cyber Physical AI Requires Systematic Execution and Domain Theories

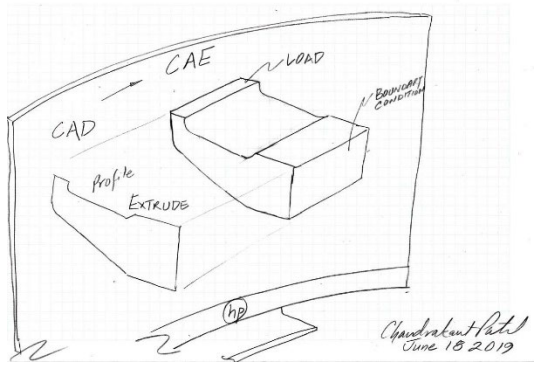
Examples

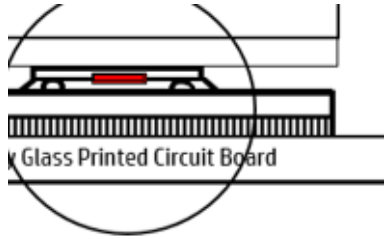
- Domain theories before AI
- Domain Theories, Data, Data Mining, AI when complexity makes physical models become inaccurate
- Data Discipline: Data with context
- Domain Theories needed to get to “causation”

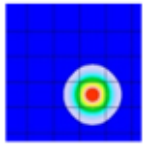
AI for Design of Optimized Systems

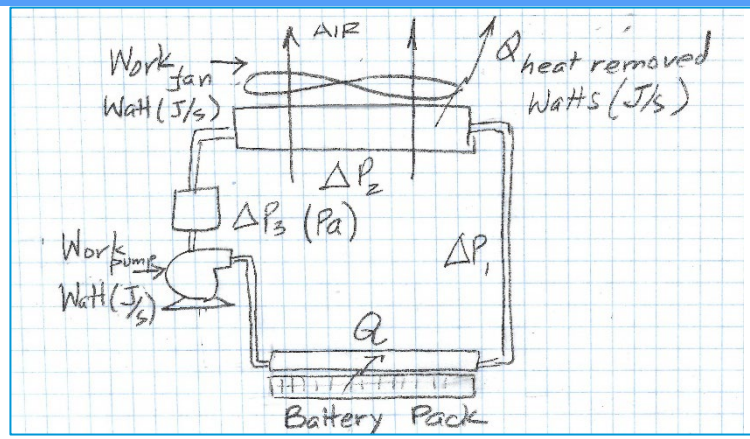
3D Printing enables shapes
Hitherto not possible cost effectively



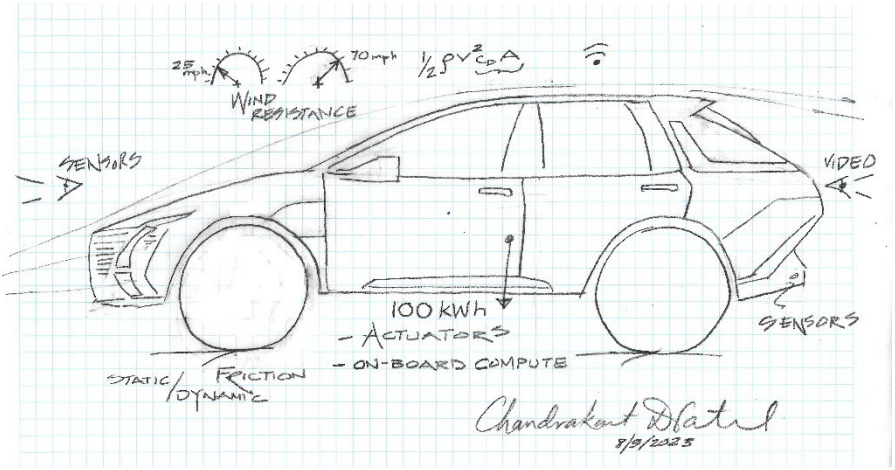








Battery Thermal Management Sub-system



Machine (Physical) Age
Drafting Table

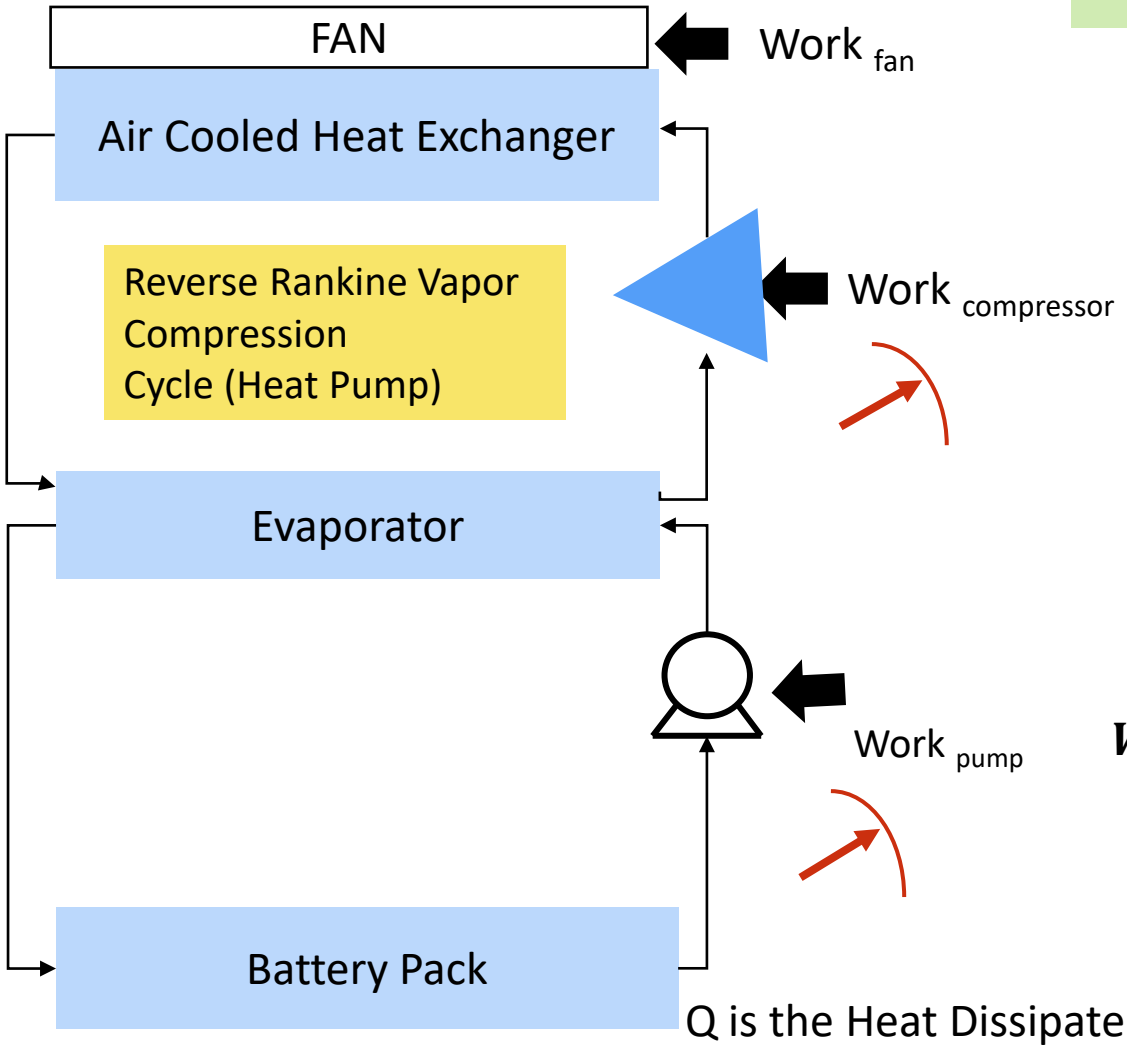
Cyber (Information) Age
CAD-CAE-CAM: 3D Part Design

Cyber Physical Age with 3D AM
Intent Based Systemic Design

References: Patel, 'Case of Art to Part" Engineering. com, 2019

Thermal Management of EV Battery

Maintain a given temperature range



Q is the Heat Dissipated (Watts)

Shape Optimization possible with 3D Printing to maximize COP

$$\boldsymbol{COP} = \frac{\boldsymbol{Q, Total\ Heat\ Dissipation\ (W)}}{\boldsymbol{Work\ done\ to\ remove\ the\ heat\ energy\ (W)}}$$

$$W_{comp} = \frac{\dot{m}_{ref} n P_2 v_2}{\eta_p \eta_{motor} (n-1)} \left[\left(\frac{P_3}{P_2} \right)^{(n-1)/n} - 1 \right]$$

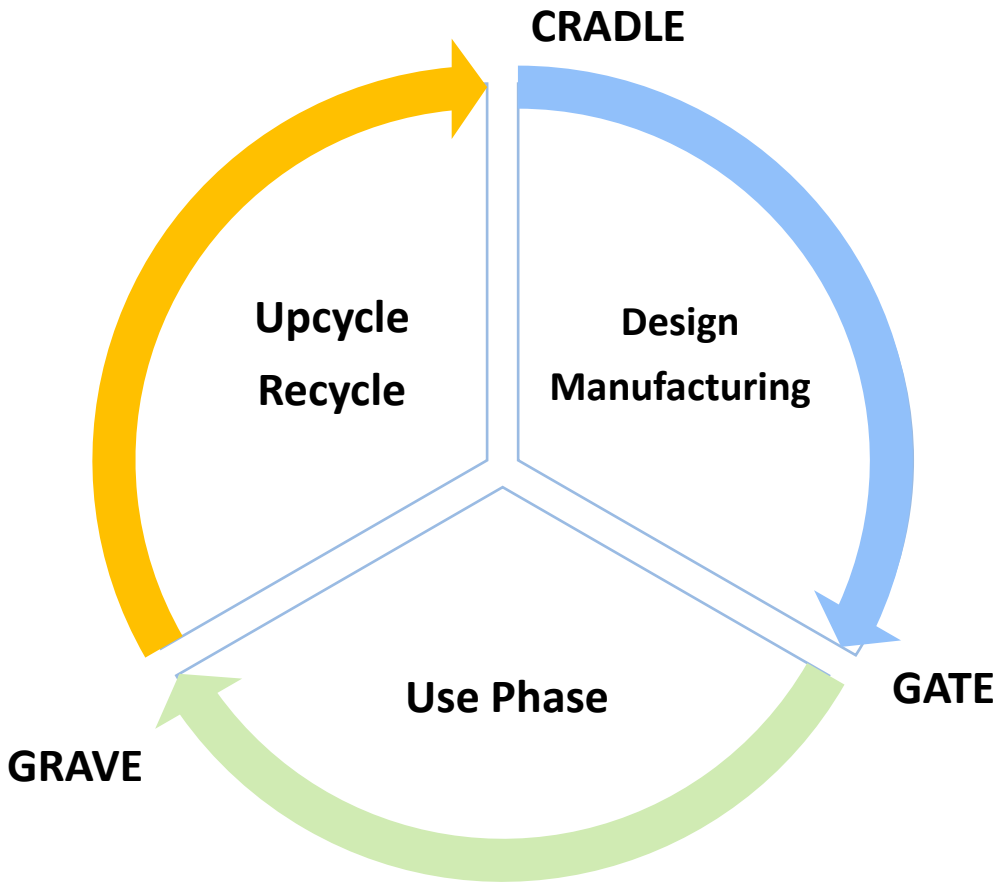
$$\boldsymbol{Work\ Done\ by\ the\ Pump} = \frac{\boldsymbol{Pressure\ Drop} * \boldsymbol{Volume\ Flow}}{\boldsymbol{Efficiency\ Pump}_{\boldsymbol{wire\ to\ water}}}$$

Managing the temperature of the drive motors, power electronics and battery.

AI for Auto Lifecycle Analysis: Battery Pack

data, data mining, classification, insights, outcomes

Cradle to Gate (design and manufacturing)	**Gate to Grave (use phase)**	**Grave to Cradle (reclaim/upcycle)**
Electrode Manufacturing	Fault Diagnosis	Upcycle e.g. Stationary Applications (home power grid)
Cell Manufacturing	**Charging & Use Power and Thermal Management**	Material Recycling
Operation Modelling	Sorting	Material Preparation
State Estimation		
Lifetime Prognostics		



References: Liu, Wang and Lai (2022), Data Science-Based Full-Lifespan Management of Lithium-Ion Battery, Springer pp 27-45

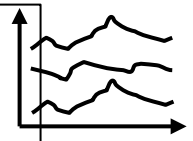
Marwah, Shah, Bash, Patel, Ramakrishnan, IEEE Using Data Mining to Help Design Sustainable Products |

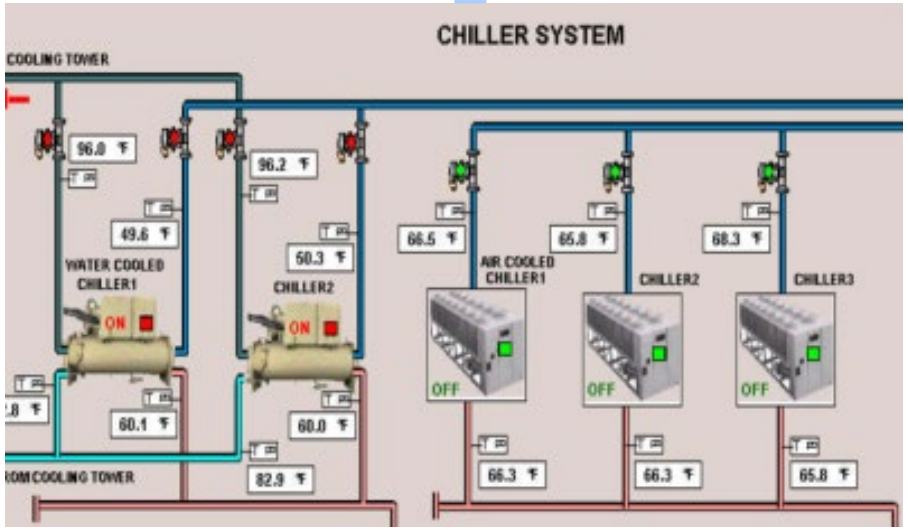
AI for Complex Systems: Cooling Tower Example

pattern mining, inference and action

Multivariate time series data (r_i, t_i) (utilization, time) from 3 air cooled, 2 water cooled chillers

- *minimize electricity and water consumption in the ensemble*
- *minimize "short cycling"*





Cluster Analysis

aabaaaacaaabcccacggggaaa

single symbol sequence

Transition Encoding

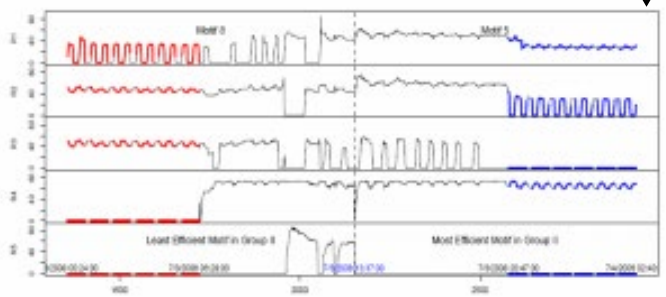
aabaaaacaaabcccacggggaaa

Motif Mining

example motif: ab->ac

Sustainability Characterization

22 motifs 3 months of data



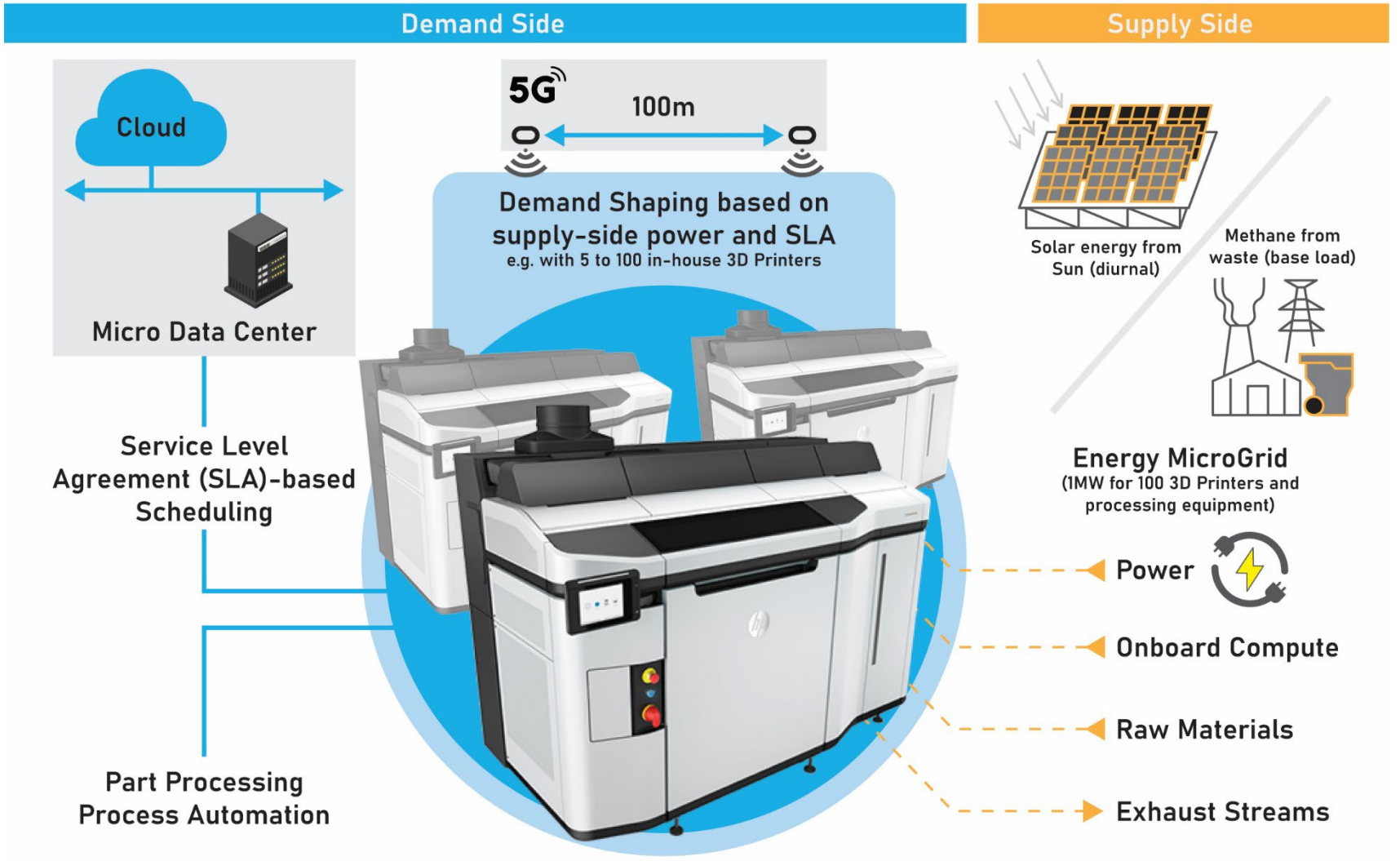
Examine time sequence using physical domain knowledge

Reference: Patnaik et. al, KDD 2009, HP Smart Data Center Project, Bangalore India Production Data Center

AI for 3D Digital Factory: Automated Operation

3D Printing Net Zero Digital Factory

1. Local Power Grid on the Supply Side (solar and biogas)
2. Complex System
3. Domain, Data, AI to schedule workloads, shape demand side to stay under the supply curve for net zero automated operation



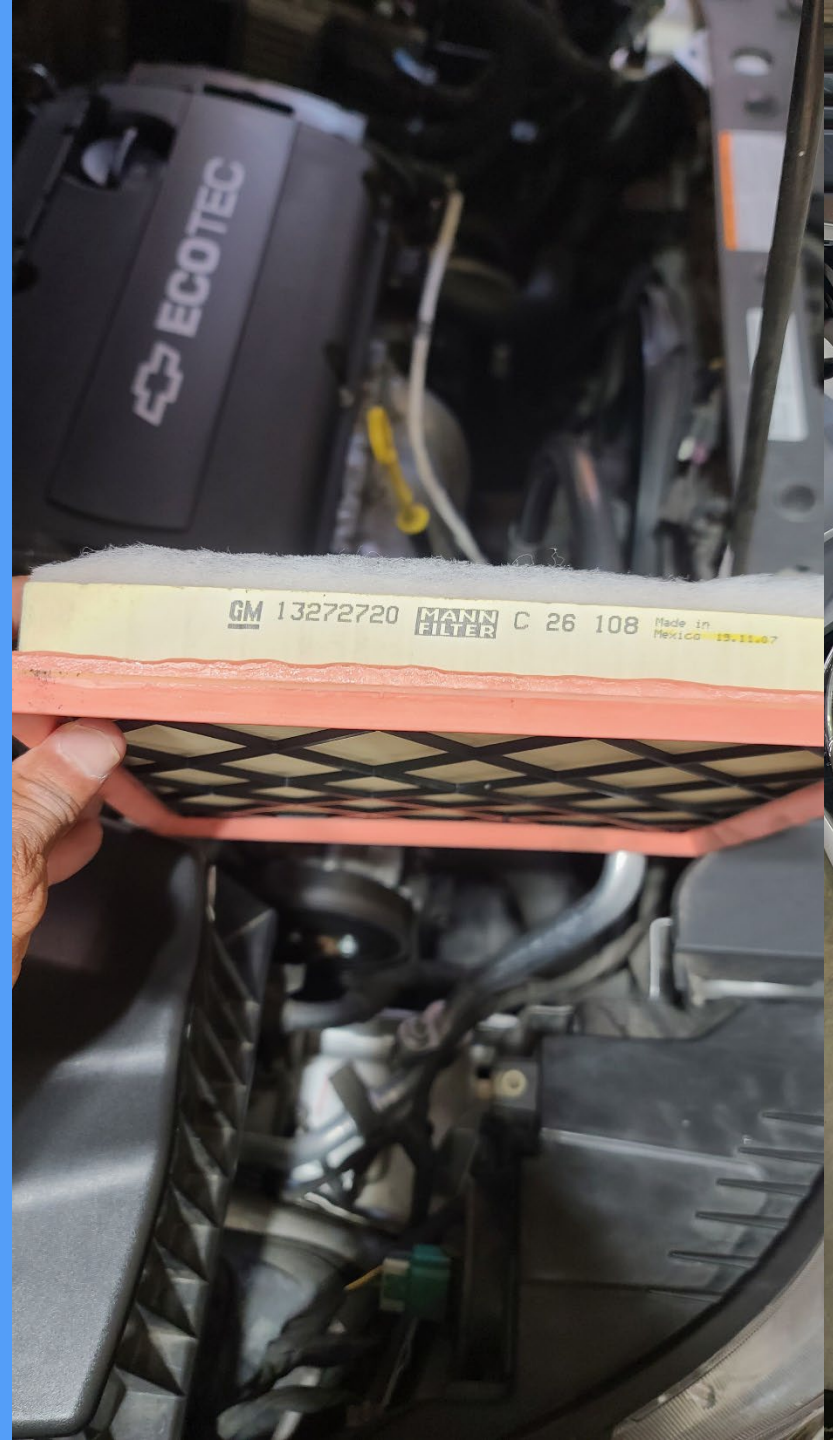
Ref. Patel and Chen, Digital Manufacturing,: Elements of Digital Factory,, Elsevier, 2023

Sketch by: Xue-Ting Song; Figure from Digital Manufacturing: Elements of Digital Factory, Elsevier;

Standardization Opportunities

Cyber Physical Authentication

- Genuine GM part ~ $35
- Purchased online
- Standardize on embedded features in inked printing to authenticate the part



Key Performance Indication for Cyber Physical Transformation

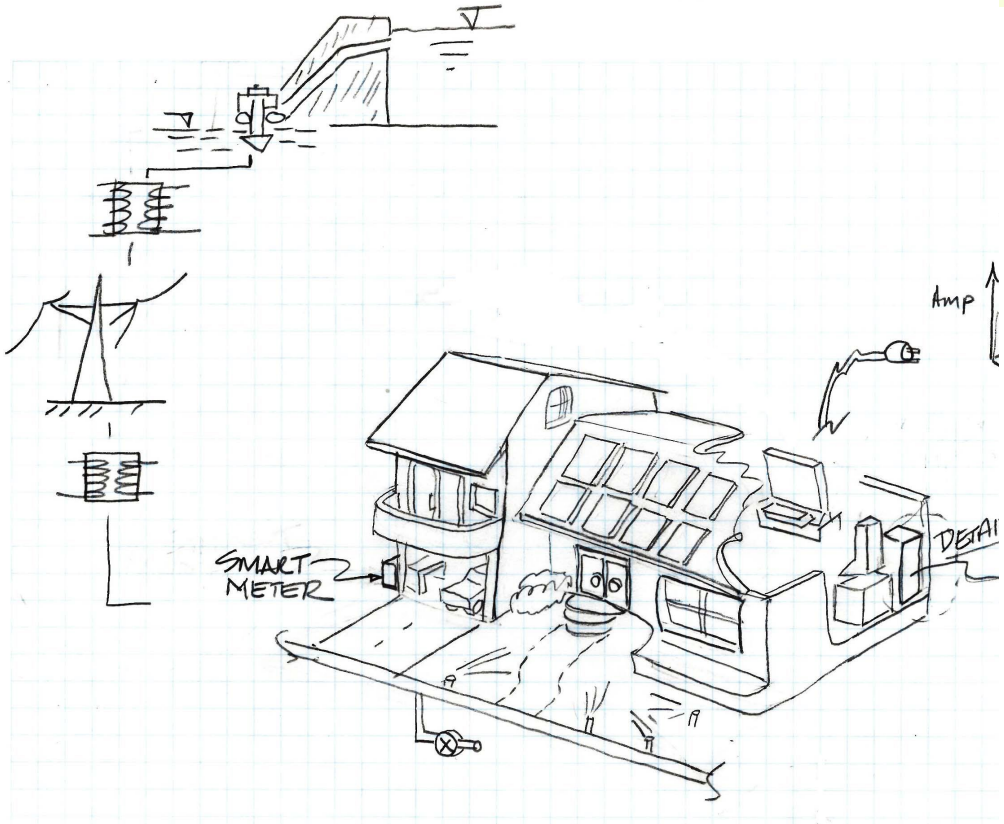
Introducing a Dimensionless Metric: Net Positive Impact (NPI)

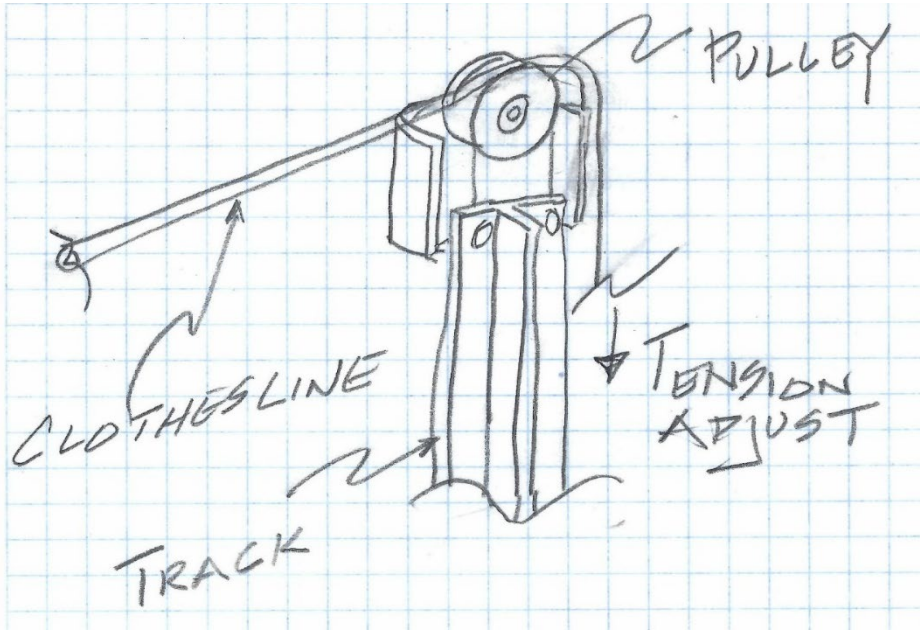
$$NPI(Net\ Positive\ Impact) = \frac{Value\ delivered\ in\ Joules\ e.g.\ Joules\ Saved}{Joules\ of\ available\ energy\ consumed\ from\ cradle\ to\ cradle}$$

20 year, Upcycled Track as NPI of 40

NPI~ 8GJ/0.2GJ

Clothespin NPI ~ 8000





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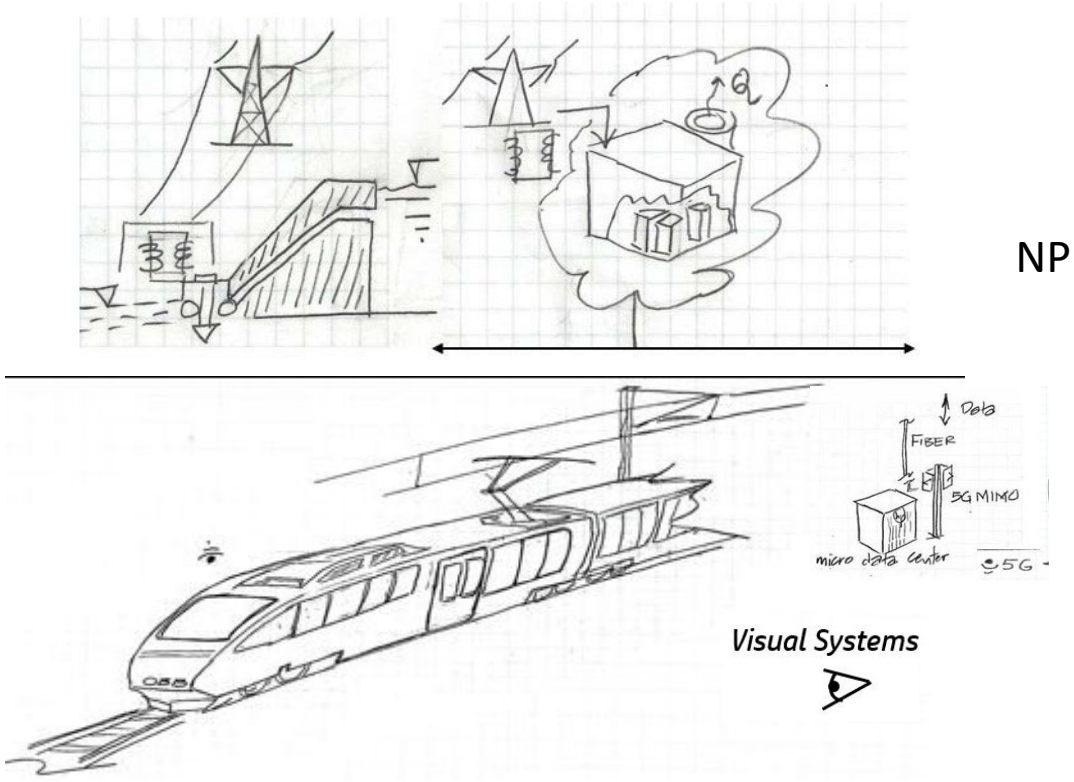


$$NPI = \frac{\text{Joules of Available Energy saved as a result of the cyber physical transformation}}{\text{Lifetime cradle-to-cradle Joules of Available Energy used for sensing, compute, communications, storage}}$$

Reference: Chandrakant Patel, "Towards Net Zero: Lifetime Joules of Energy Consumed is the True Cost of a Product"

https://www.linkedin.com/pulse/towards-net-zero-lifetime-joules-true-cost-product-patel-pe/

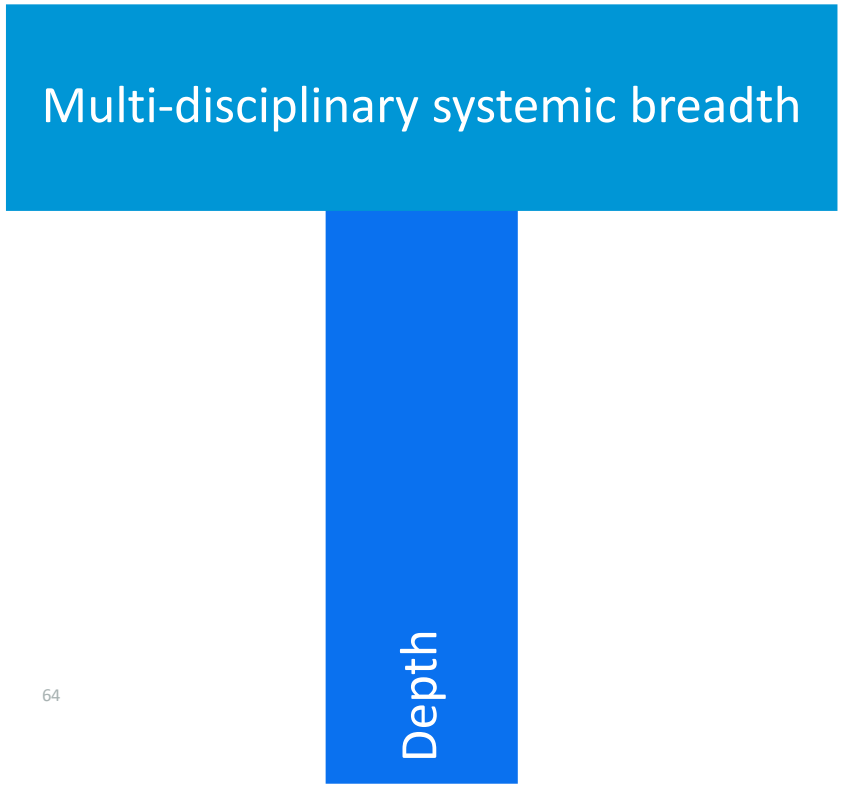
Skills Needed for the Age of AI

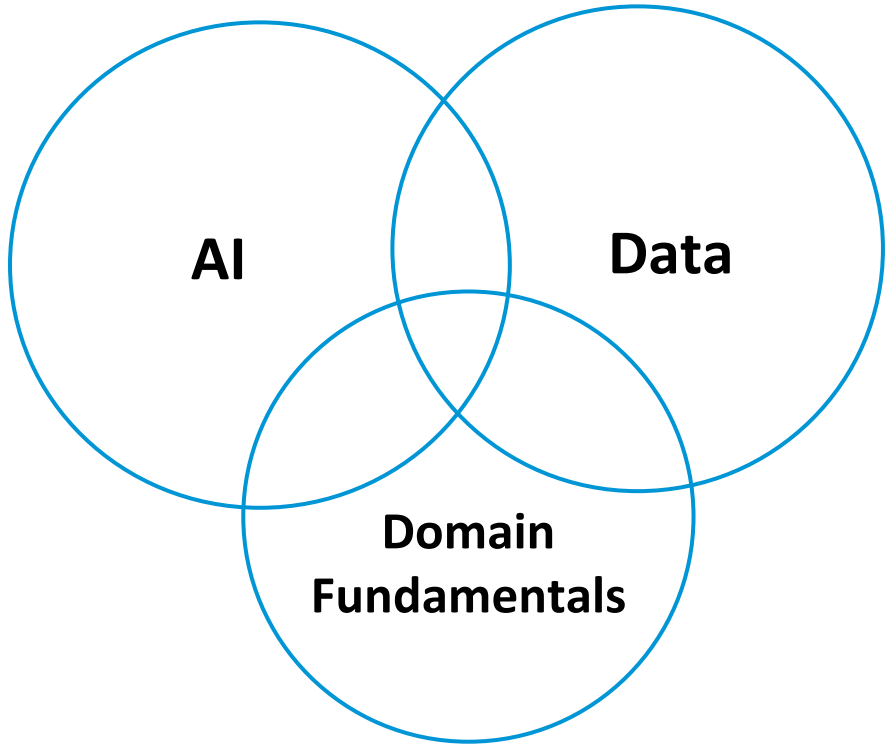
depth in physical fundamentals breadth in data science

T-Shaped Cyber Physical Contributors

Success necessitates:

1. Depth in physical sciences
2. Breadth in multiple disciplines – cyber sciences, economics, social sciences, art, history, culture
3. Learn-by-doing systemic execution through multidisciplinary collaboration





References: Patel and Baveja, "Rise of Cyber Physical Systems", National Academies of Engineering, 2023

Thank You

Panel Session: EU-US Regulatory Landscape – Focus on Sustainability

- The sustainability regulatory landscape is in continuous evolution and new requirements are being established to meet the ambitious energy and climate targets agreed by governments across the world. This panel session is going to explore the current EU-US regulatory landscape for sustainability and how standards can be used to demonstrate that products, services, or processes comply with the requirements of relevant legislation.

- **Craig Updyke**, Director, Global Policy & International Trade – ASTM International
- **Christopher Clement**, Senior Director, Government Affairs – Siemens Energy
- **Chuck Chaitovitz**, Vice President, Environmental Affairs and Sustainability – U.S. Chamber of Commerce
- **Amy Costello**, Product Stewardship and Sustainability Manager – Armstrong World Industries
- **Jeffrey G. Weiss**, Partner – Steptoe

CertaLink Certificates for Energy Markets

Growing from Need to Certification

Christopher Clement

ANSI CMF Panel : EU-US Regulatory Landscape – Focus on Sustainability

March 21, 2024

Climate action creates the urgent need for digital certification systems!

SIEMENS energy

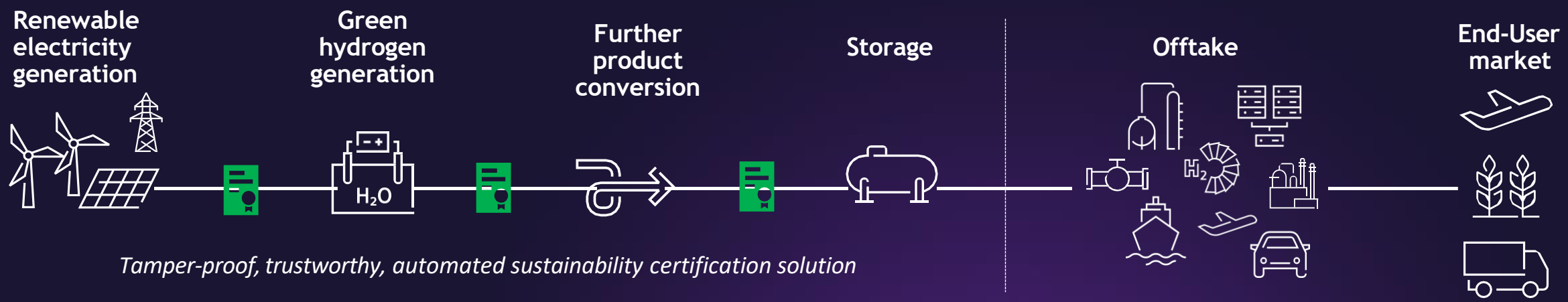
No standard, no transparency, no automated certification

Missing cross sector certification

Tamper-proof sustainability as a new customer demand

Sustainability Certificates:

- Prerequisite for **carbon-neutral energy marketplaces**
- Trust through a **more precise traceability**
- Full sector-integration trough **end-to-end certification**



CertaLink Energy Certification Manager

In collaboration with trusted partners, we offer one-stop shop certification

Application test at Nobian's Chlor-Alkali site

CertaLink Energy Certification for green chemical co-products

February 2024

Blockchain solution pilot for certification of green hydrogen

Start with CO_2 free electricity

CertaLink Energy Certification across sectors and borders

Prove your product is green

Contact page

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Senior Director, Government Affairs
Siemens Energy, Inc.

Mobile: +1-202-704-9931
Email: christopher.clement@siemens-energy.com

siemens-energy.com/certalink-energy-certificates

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Panel Session: Open-Source Approach to Standardization

- Open-Source Software has become increasingly popular with many companies and organizations using and contributing to open-source projects via open-source organizations. This panel session is going to explore some differences in standards development approach for open-source vs traditional SDO and how and why open-source organizations and the standards development organizations could collaborate and interact considering their distinct governance structures.

- **David McCall**, Senior Director, Industrial Standards – Intel Corporation

ANSI Company Member Forum – March 2024

Open-Source Approach to Standardization

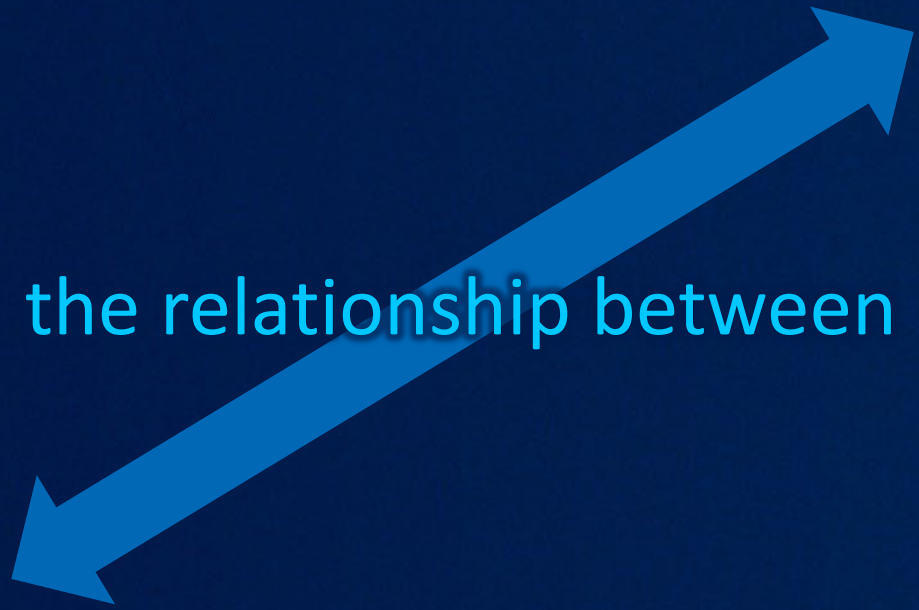
David McCall

Senior Director, Industrial Standards
Network & Edge (NEX) and Federal & Industrial Solutions (FIS)

Open Source approach to Standards

Standards approach to Open Source

Open Source



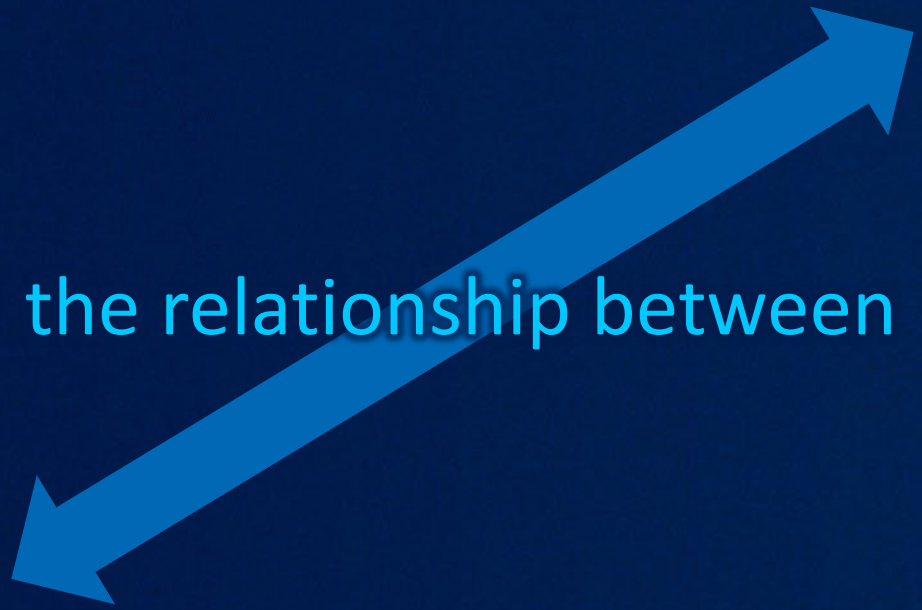
the relationship between

Standards

See attributions slide for copyright information.

See attributions slide for copyright information.

Open Source



the relationship between

Standards

Best Practices Standard

Performance Standard

Interoperability Standard

Open Source IS the Standard

Open Source DRIVES the Standard

Open Source IS PART OF the Standard

Open Source IS the Standard

Fewer products

Homogenous ecosystem using one implementation

Problems fixed via fast iteration

Open Source DRIVES the Standard

One implementation leads development

Subsequent specification enables broad interoperability

Requires a “change of pace” at some point

Open Source DRIVES the Standard

"You don't get to add any new capabilities to the code until the spec details all the current ones!"

IEEE SA ~~Standards~~ Specification Development Lifecycle

Base Spec + Profile

Groups of mandatory and optional requirements

Test Spec

Defines how functionality should be tested and the expected results

Golden Units

"Known good" devices that have proved their interoperability, usually production units

Test Tool

Implements the Test Spec

Lab

Carries out the testing and generates test results

Certification Body

Validates the Test Tool and the Lab. Verifies whether the test results indicate a device or system under test is conformant. Lists certified devices.

Selection

Validation

Open Source IS PART OF the Standard

Open Source is developed in parallel

First implementation – Golden Unit – Basis of Test Tool

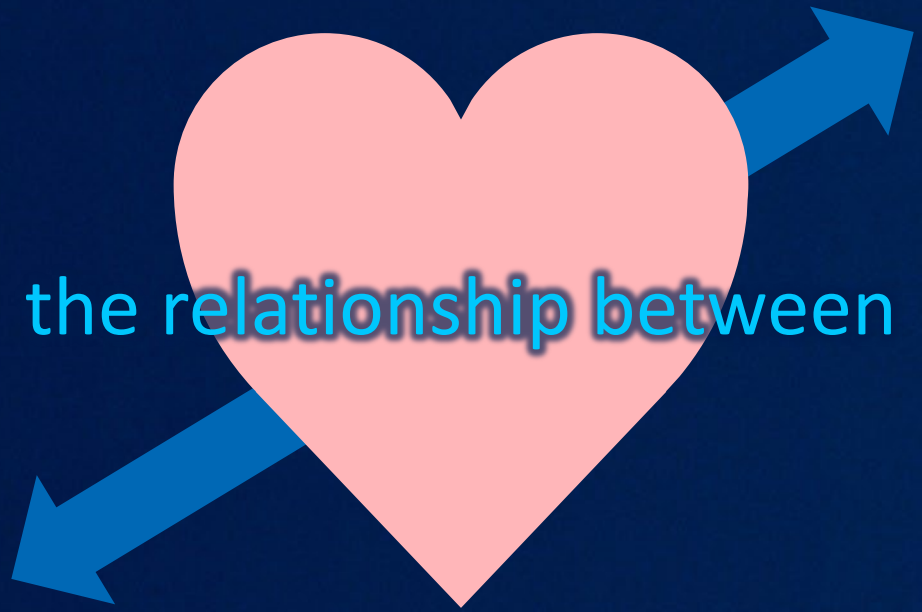
Requires discipline & co-ordination

Open Source IS PART OF the Standard

"You don't get to start on the next version of the spec until there's open source code for everything in this one!"

Open Source	Standards
Open	NDA
Iterative	Stable
How?	What?
Meritocratic	Democratic

Open Source



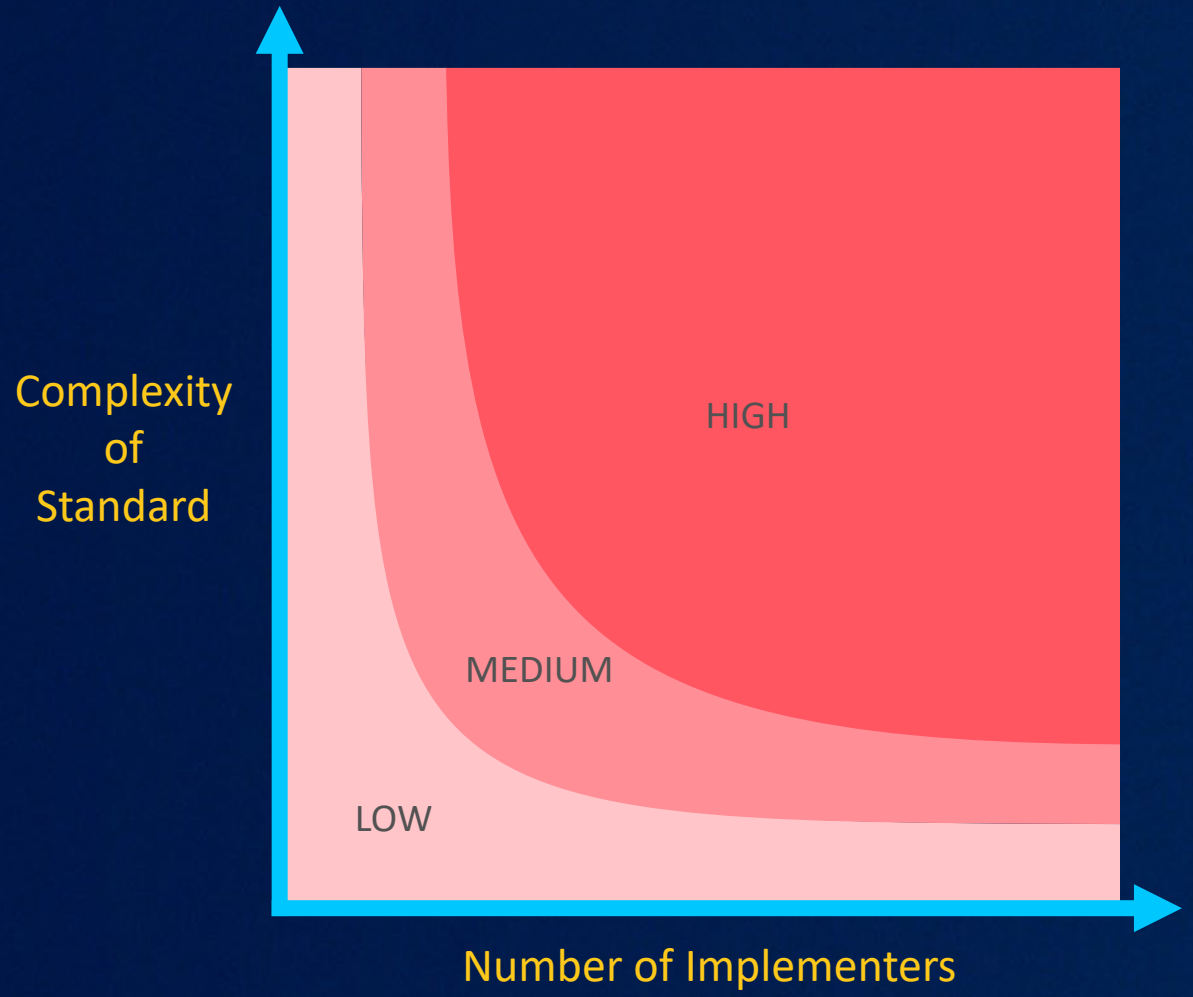
Standards

Questions?

Thank You


intel

Need for a Formal Certification Program



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- Anarchists photograph: © 2012, Evgeniy Isaev
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  Cropped version of original

Sustainable Aviation Fuel and Additive Manufacturing

- Aviation is facing increasing challenges from climate change, resource scarcity, and public demand for greener and smarter solutions. In this Talk, Dale Smith will introduce two emerging technologies that can address these challenges: sustainable aviation fuel and additive manufacturing. He will explain how these technologies work, why they matter, and what is the vision to transform aviation for the future.

- **Dale Smith**, Regional Director, Enterprise Environmental Sustainability – Boeing

BOEING

SUSTAINABLE AEROSPACE TOGETHER

Dale Smith

Regional Director, Environmental Sustainability

March 21, 2024

SUSTAINABILITY AT BOEING

SUSTAINABLE
AEROSPACE
TOGETHER

PEOPLE

- Workplace safety
- Employee well-being
- Global equity, diversity and inclusion
- Professional development, education and learning

90% of employees surveyed say their manager supports their overall well-being

PRODUCTS & SERVICES

- Aerospace safety
- Sustainable product life cycle
- Climate change
- Innovation and clean technology

5.6 million gallons (21.2 million liters) of SAF purchased for 2023 commercial operations

OPERATIONS

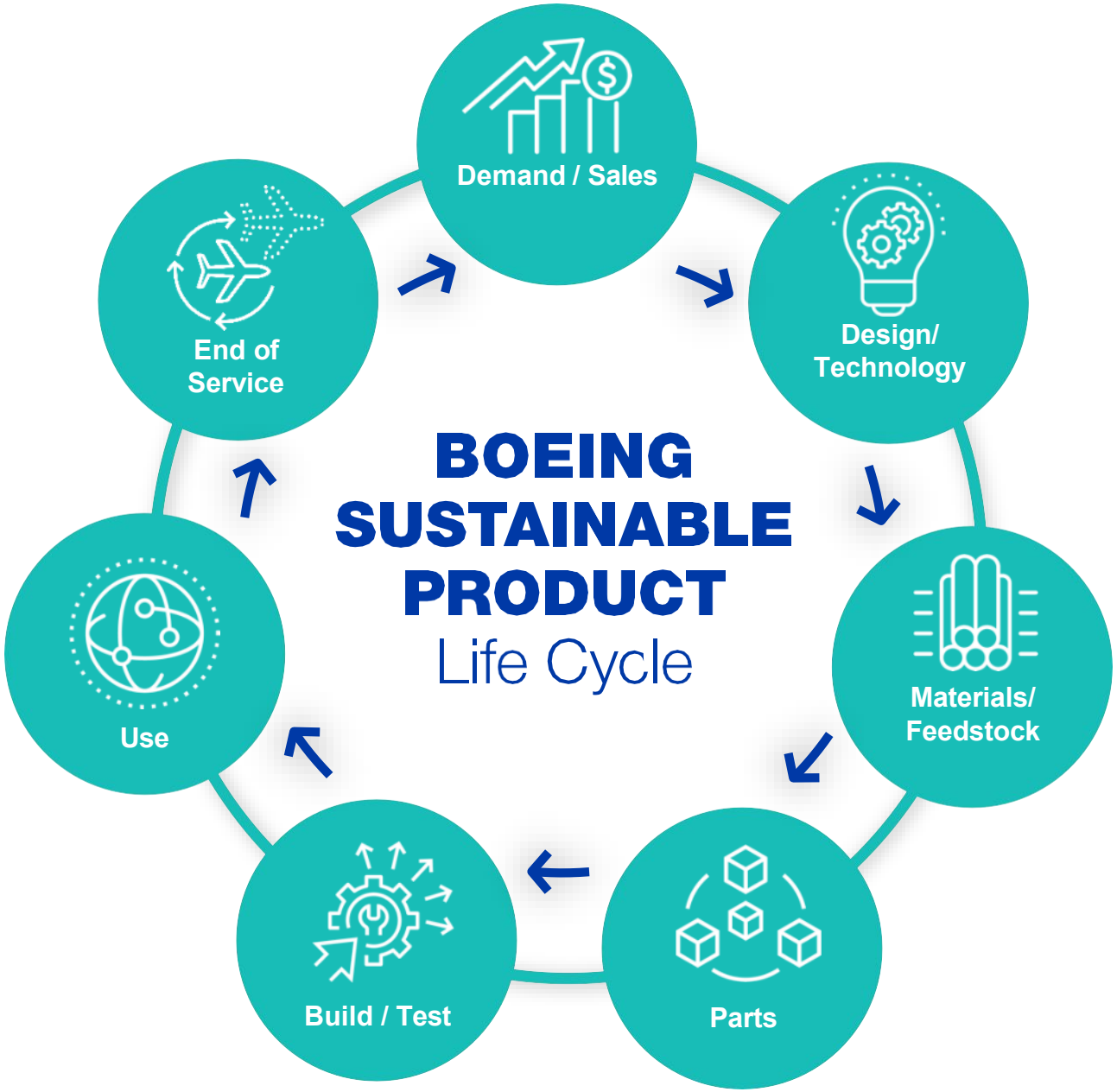
- Quality
- Sustainable operations
- Responsible supply chain
- Data privacy and information security

31% reduction in greenhouse gas emissions from Boeing operations since 2017

COMMUNITIES

- STEM initiatives
- Military and veteran assistance
- Racial equity advancement
- Disaster recovery and relief efforts

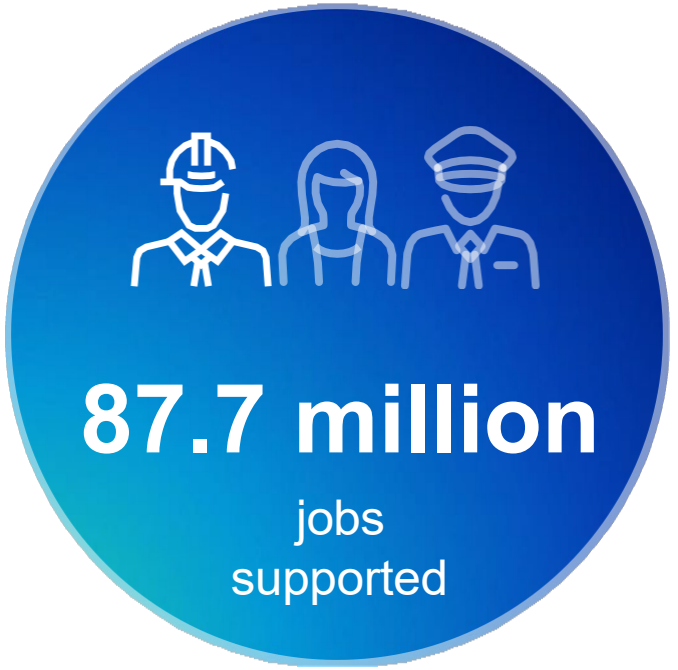
$2B in Boeing community investments over the last 10 years



SUSTAINABLE
AEROSPACE
TOGETHER

De-carbonizing Aviation

Net Zero by 2050



Source: ATAG

2.5%
Aviation

20%
Transportation

17%
Construction

8%
Building

10%
Other

43%
Electricity and heat

Source: 2019, World Resources Institute

FLEET RENEWAL

OPERATIONAL EFFICIENCY

RENEWABLE ENERGY

ADVANCED TECHNOLOGY

CORSIA Carbon Offsetting and Reduction Scheme for International Aviation

Cascade

SustainabilityTogether.aero

SUSTAINABLE AEROSPACE TOGETHER

MIT LABORATORY FOR AVIATION AND THE ENVIRONMENT

IATA

UNIVERSITY OF CAMBRIDGE

Aviation Impact Accelerator

NASA

SUSTAINABLE
AEROSPACE
TOGETHER

SAF &

Hydrogen / Electric

Keys to accelerating sustainable aviation fuel supply growth

Supportive government policies

Feedstock diversity & robust sustainability criteria

R&D to enable cost competitiveness & supply growth

Access to capital for new production

Market-based incentives to make SAF price competitive

Industry View

SUSTAINABLE AEROSPACE TOGETHER

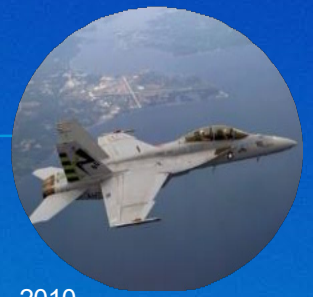
		2020	2025	2030	2035	2040	2045	2050
~27% of CO2 emissions	**Commuter** 9-50 seats <60 minute flights <1% of industry CO2	SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF
	Regional 50-100 seats 30-90 minute flights ~3% of industry CO2	SAF	SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF
	Short haul 100-150 seats 45-120 minute flights ~24% of industry CO2	SAF	SAF	SAF	SAF potentially some Hydrogen	Hydrogen and/or SAF	Hydrogen and/or SAF	Hydrogen and/or SAF
~73% of CO2	**Medium haul** 100-250 seats 60-150 minute flights ~43% of industry CO2	SAF	SAF	SAF	SAF	SAF potentially some Hydrogen	SAF potentially some Hydrogen	SAF potentially some Hydrogen
	Long haul 250+ seats 150+ minute flights ~30% of industry CO2	SAF	SAF	SAF	SAF	SAF	SAF	SAF

Source: ATAG Waypoint 2050 Report

BOEING & SAF

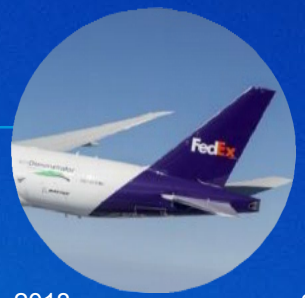
SUSTAINABLE AEROSPACE TOGETHER

2009
Co-founded Sustainable Aviation Fuel Users Group (SAFUG)



2010
Boeing supports the supersonic flight of a U.S. Navy F/A-18 on a 50/50 SAF blend - U.S. Navy photo

2014
Proposed and partnered with Neste on ASTM approval of Green Diesel pathway



2018
First commercial airplane test using 100% SAF

2018
Launched program for biofuel delivery flights from Boeing Delivery Centers

2022
2 million gallons of SAF procured for operations

2023
Founding Partner in UA Sustainable Flight Fund

2023
Developed jet reference fluid to test for 100% SAF compatibility

2008 2010 2012 2014 2016 2018 2020 2022 2024

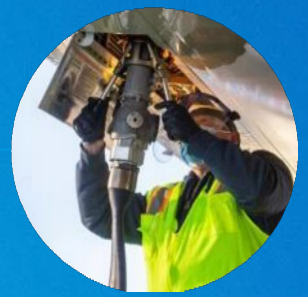
2008
First SAF test flight

2011
Led research approval of HEFA pathway

2011
First regional multi-stakeholder roadmaps in the US and Australia

2012
Used biofuel on every ecoDemonstrator program since 2012

2021
Committed to deliver 100% SAF capable airplanes by 2030



2021
Boeing-SkyNRG partnership

2021
Partnered with United Airlines on first passenger flight with 100% SAF in one engine and Rolls-Royce on 100% SAF flight

2021-2022
Partnered with NASA to test the emissions of SAF

2023
5.6 million gallons of SAF procured for operations

Boeing is partnering and investing around the world to accelerate SAF development and production

SUSTAINABLE AEROSPACE TOGETHER

SAF Dashboard

SustainabilityTogether.aero

SUSTAINABLE AEROSPACE TOGETHER

Capacity | Regions

Gallons | RESET FILTERS

SELECTION OPTIONS

Operational Date: 2030

Fuel Type: SAF

Pathway: (All)

Use the dropdown to view capacity announcements by facility life cycle stage, and toggle the slider to set an assumption around what percent of announced capacity will end up being produced.

Life Cycle Stage: (All)

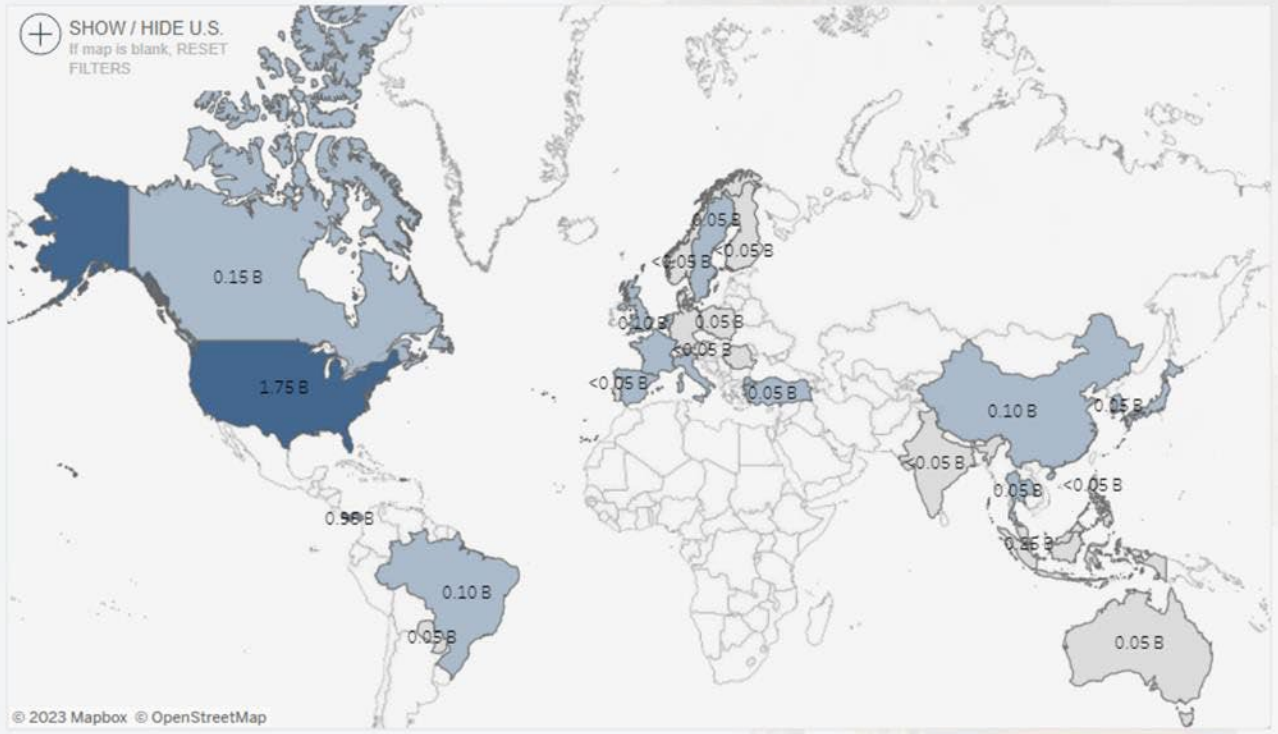
Actual Production %: 70%

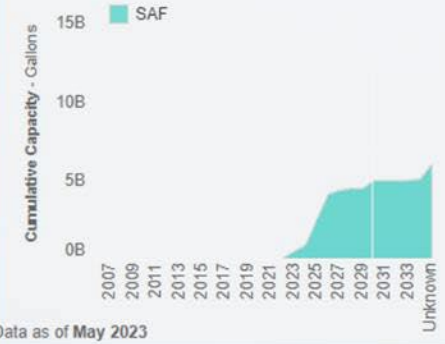
CUMULATIVE CAPACITY ANNOUNCEMENTS

Gallons

SHOW / HIDE U.S.

If map is blank, RESET FILTERS





Data as of **May 2023**

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SAF & **Hydrogen**

SUSTAINABLE
AEROSPACE
TOGETHER

SAF & Electrification

SUSTAINABLE
AEROSPACE
TOGETHER


BOEING

Closing Items

Networking Reception
4:00pm – 6:00pm CST

Save the Date: Call for Nominations for 2025 CMF Chairperson Positions

JULY 15 – AUGUST 30

Membership Staff Contact Information

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ANSI
American National Standards Institute

2024 March Company Member Forum

March 22, 2024

Day 2

The meeting will begin at 9am CST

Welcome and Opening Items

- **Alan Manche**, Vice President, External Affairs – Schneider Electric, ANSI CMF Chair

Company Member Forum
Housekeeping Items

- Please display your name and affiliation on Zoom.
- All attendees are automatically muted on entry. You have the ability to unmute yourself, however we ask that you please remain muted at all times, unless you have requested permission to speak. This will greatly reduce any background noise.
    - To request permission to speak during the meeting, please type **"SPEAK"** in all caps in the general chat box. We have designated staff that will be closely monitoring the chat, and controlling the queue to speak throughout the meeting. The "raise hand" feature will not be used during this meeting.
    - The **"raise hand" feature will not be used** during this meeting.
    - When speaking, please introduce yourself with your name and affiliation.
- You can also use the chat to ask questions and make comments throughout the meeting, if you do not wish to speak.
    - Please note that if you call in without connecting to the Zoom, you will not be able to use the chat function.
- This meeting is being recorded for note taking purposes. The presentation and meeting summation will be available post event.

Keynote Presentation: Leadership in Standards Development

- **Nestor J. Rivera,** Senior Vice President and Deputy General Counsel, Trust & Privacy – HP, Inc.

Panel Session: Developing Standards Experts

- Technical Standards Experts and other stakeholders involved in standardization activities within a company need a comprehensive education on the standards process to ensure effective and informed decision-making. This education empowers experts to drive innovation responsibly, promote interoperability, and address emerging challenges within their respective domains, fostering a robust and forward-thinking standardization landscape. This panel session is going to explore how companies are working on developing their internal standards experts and other relevant stakeholders.

- **Stephen Walls**, Interim Senior Manager, Enterprise Product Standards Office – Boeing
- **Mercedes Mira Costa**, Senior Program Manager – HP, Inc.
- **Dennis J. Duncan**, Senior Counsel – Nokia
- **Peter Pondillo**, Senior Manager, Standards and Policy – Corning

Panel Session: Developing Standards Experts
ANSI CMF 2024

Stephen Walls
The Boeing Company
Manager, Enterprise Standards Integration

Responsible for strategy, integration, and support of standards participants and users.

Dennis Duncan
Nokia
Senior Counsel

Supports IPR development & monetization of standards contributions. Held previous roles for firms implementing standards as well as SMEs.

Mercedes Mira Costa
HP Inc.
Senior Program Manager, Industry Standards Program Office

Responsible for external standards engagement & leading HP's efforts on EU standards policy.

Peter Pondillo
Corning
Senior Manager, Standards and Policy

Responsible for Corning's Global Technology & Industry Standards (GTIS) management & operations.

Fireside Chat: ISO/IEC 42001, Artificial Intelligence Management System (AIMS) Standard

- To follow up on ANSI CMF December 2023 conversation on Management System Standards, this fireside chat is going to discuss the recently published ISO/IEC 42001 standard on Artificial Intelligence Management System (AIMS). This standard provides a certifiable AIMS framework in which AI systems can be developed and deployed as part of an AI assurance ecosystem. The global standard specifies the requirements for establishing, implementing, maintaining, and continually improving an AIMS.

- **Kimberly Lucy**, Director of Standards – Microsoft
- **Lenora Zimmerman**, Standards Development and Intelligence – Google

ISO/IEC 42001 AI Management System (AIMS)

- March 22, 2024
- Kim Lucy, Director GRC Standards, Microsoft
- Lenora Zimmerman, Standards Development and Intelligence, Google

ISO/IEC 42001 Structure

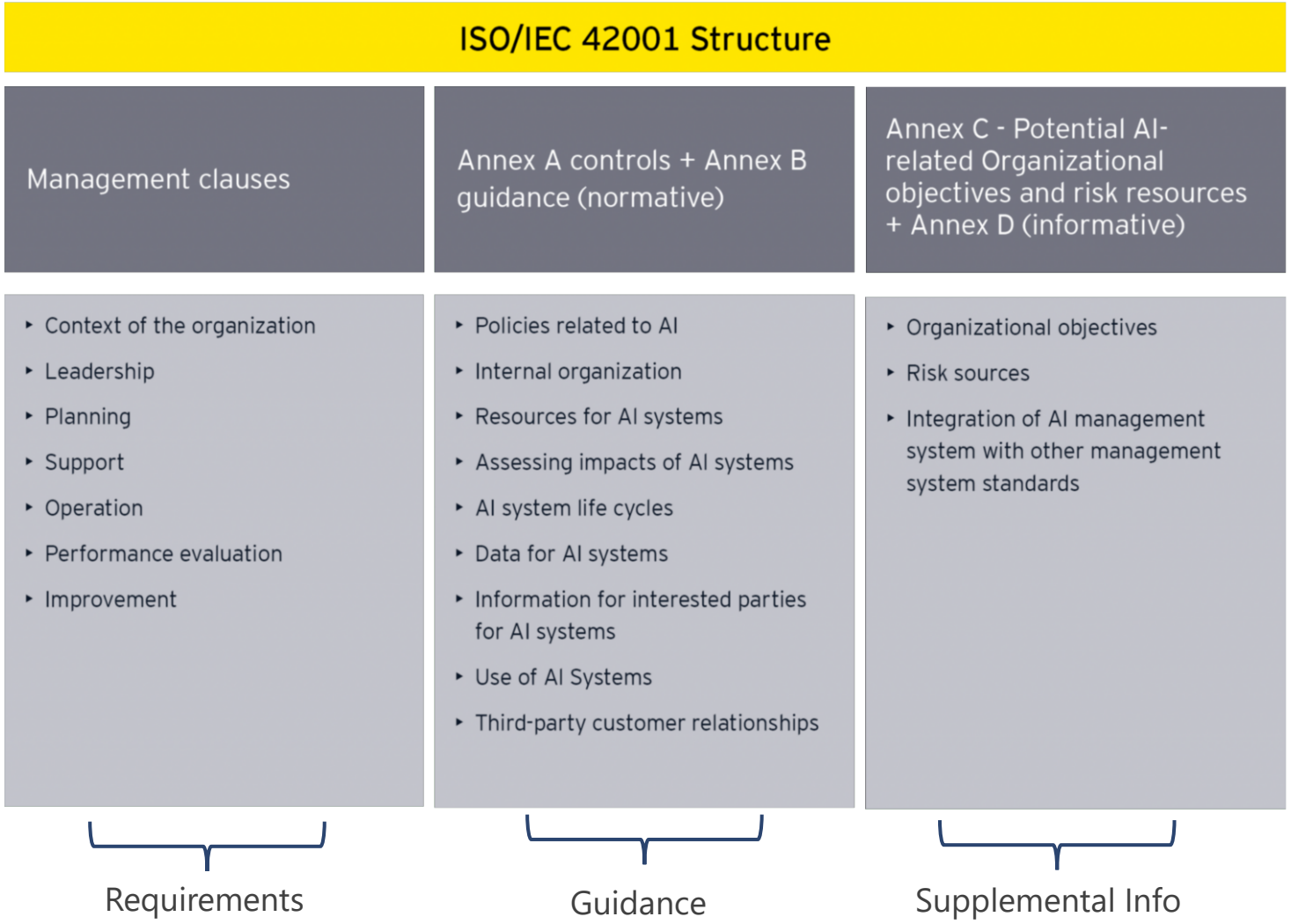
42001/AIMS:

- A **sector specific** management system standard for **responsible** AI
- Conforms to all generic MSS requirements, with specific considerations, controls, and guidance for AI systems

Scope

This document specifies the requirements and provides guidance **for establishing, implementing, maintaining and continually improving** an AI (artificial intelligence) management system within the context of an organization.

This document is intended for use by an organization providing or using products or services that utilize AI systems. This document is intended to help the organization develop, provide or use AI systems **responsibly** in pursuing its objectives and **meet applicable regulatory requirements**, **obligations related to interested parties and expectations from them**



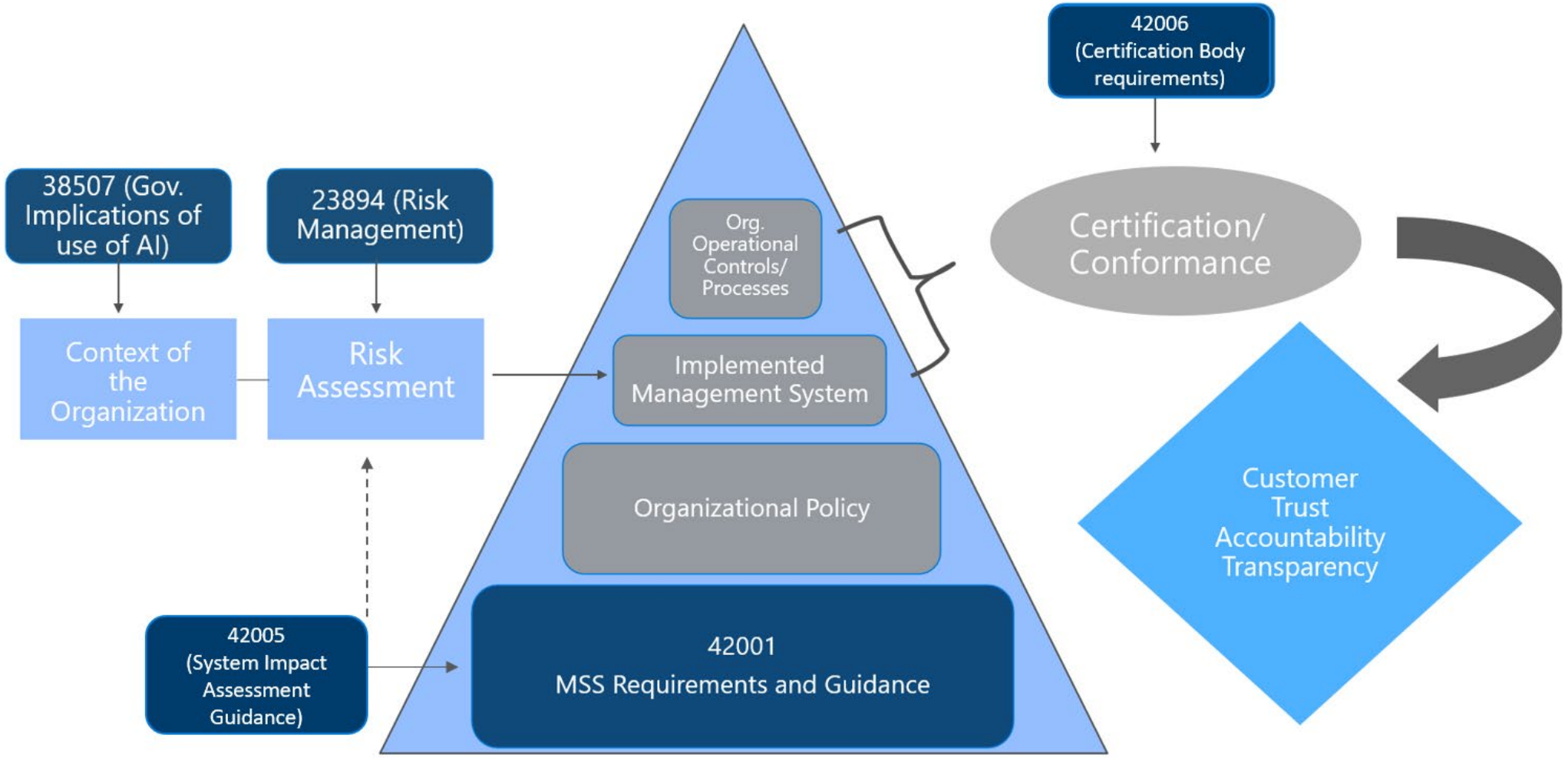
Management clauses

4 Context of the organization	• 4.1 Understanding the organization and its context • 4.2 Understanding the needs and expectations of interested parties • 4.3 Determining the scope of the AI management system • 4.4 AI management system
5 Leadership	• 5.1 Leadership and commitment • 5.2 AI policy • 5.3 Roles, responsibility, and authority
6 Planning	• 6.1 Actions to address risks and opportunities • 6.2 AI objectives and planning to achieve them • 6.3 Planning of changes
7 Support	• 7.1 Resources • 7.2 Competence • 7.3 Awareness • 7.4 Communication • 7.5 Documented information
8 Operation	• 8.1 Operational planning and control • 8.2 AI risk assessment • 8.3 AI risk treatment • 8.4 AI system impact assessment
9 Performance Evaluation	• 9.1 Monitoring, measurement, analysis, and evaluation • 9.2 Internal audit • 9.3 Management review
10 Improvement	• 10.1 Continual improvement • 10.2 Nonconformity and corrective action

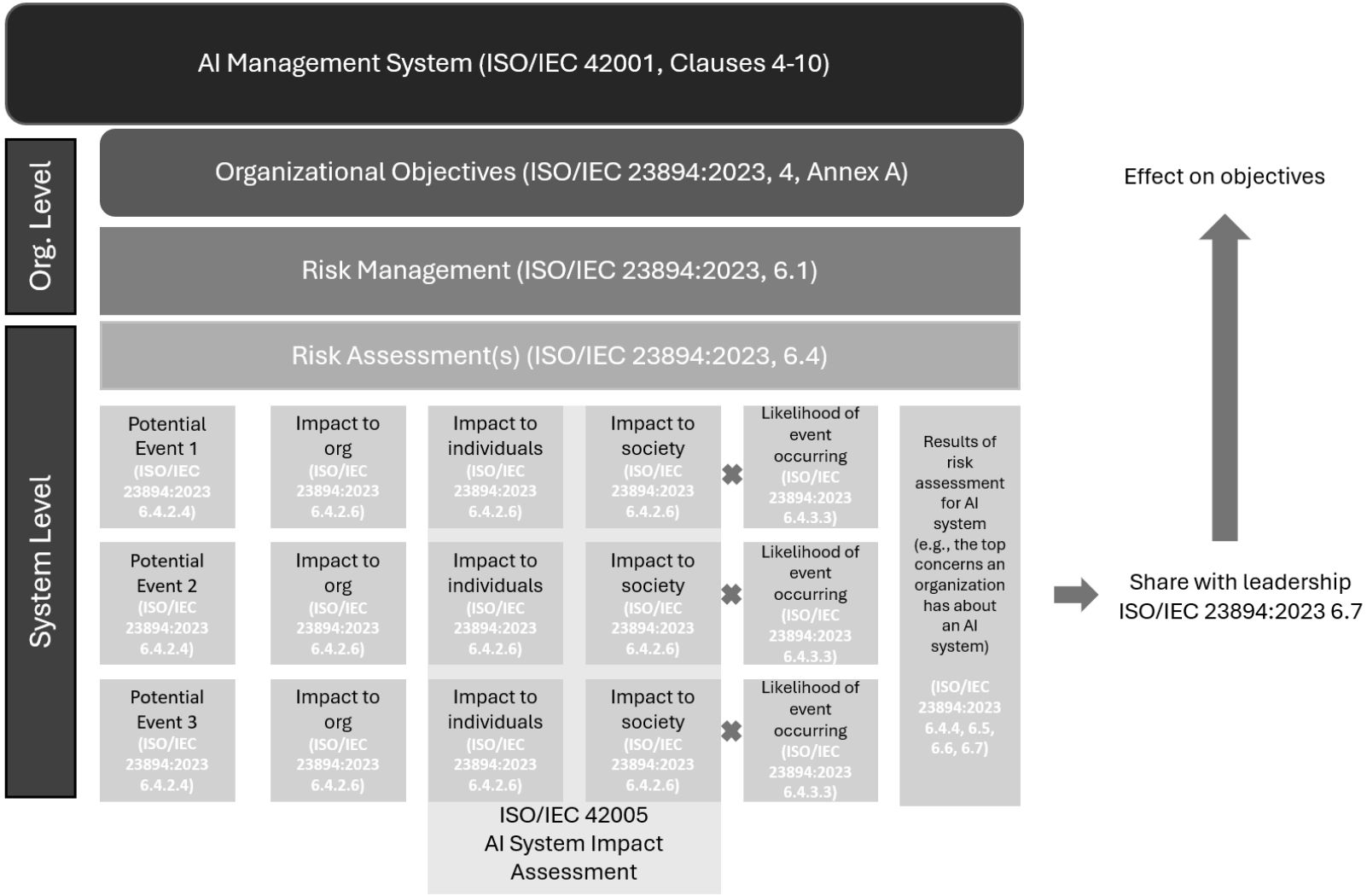
Annex A Controls (operational/system level)

A.2	Policies related to AI	-AI Policy -Alignment with other organizational polices -Review of the AI policy
A.3	Internal Organization	-AI Roles and responsibilities -Reporting of concerns
A.4	Resources for AI systems	-Resource documentation -Data resources -Tooling resources -System and computing resources -Human resources
A.5	Assessing impacts of AI systems	-AI system impact assessment process -Documentation of AI system impact assessments -Assessing AI system impact on individuals or groups of individuals -Assessing societal impacts of AI systems
A.6	AI system lifecycle	-Objectives for responsible development of AI system -Processes for responsible AI system design and development -AI system requirements and specification -Documentation of AI system design and development -AI system verification and validation -AI system deployment -AI system operation and monitoring -AI system technical documentation -AI system recording of event logs
A.7	Data for AI systems	-Data for development and enhancement of AI system -Acquisition of data -Quality of data for AI systems -Data provenance -Data preparation
A.8	Information for interested parties of AI systems	-System documentation and information for users -External reporting -Communication of incidents -Information for interested parties
A.9	Use of AI systems	-Processes for responsible use of AI systems -Objectives for responsible use of AI systems -Intended use of the AI system
A.10	Third-party and customer relationships	-Allocating responsibilities -Suppliers -Customers

Supporting standards in the foundational AI ecosystem



Relationship between AI risk, impact, and the overall management system



Coffee Break
ENDS at 11:15 am CST

Interactive Session: Standards – A Foundational Component of Quality Credentials

- Standards are the backbone of effective credential programs, with three key areas forming a ‘quality triangle’ to enhance learning outcomes. Comprehensive, balanced, and effective standards guiding personnel certifications, assessment-based certificate programs, and workplace learning make up a tripod of guidance that can meaningfully elevate a skilled workforce in the U.S. This panel session is going to explore the role of standards in forming this quality triangle.

- **Karen Elzey,** Associate Executive Director, Operations – Workcred

workcred

an affiliate of ANSI

Standards – A Foundational Component of Quality Credentials

Karen Elzey
Associate Executive Director, Operations, Workcred

March 22, 2024

Workcred's Mission & Vision

Mission

To strengthen workforce quality by improving the credentialing system, ensuring its ongoing relevance, and preparing employers, workers, educators, and governments to use it effectively.

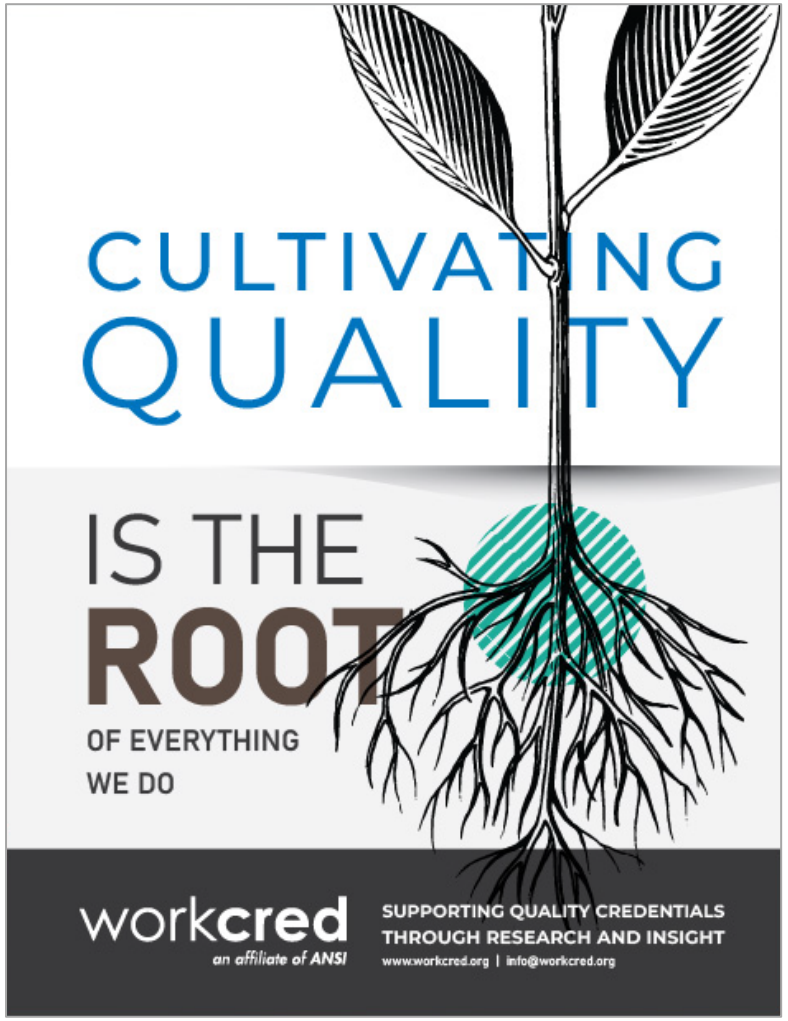
Vision

A labor market which relies on the relevance, quality, and value of workforce credentials for opportunities, growth, and development.

workcred
Connecting credentials, competencies, careers, customers
an affiliate of ANSI

Workcred's Unique Expertise

- ✓ Creating valid qualitative and quantitative research projects to determine the quality, effectiveness, and market value of a credential, and its impact on an industry
- ✓ Building educational pathways that combine different types of credentials
- ✓ Aligning academic curriculum with competencies assessed on industry-recognized credentials
- ✓ Building credentialing programs that meet quality standards
- ✓ Helping employers articulate competencies and design or select appropriate credentials
- ✓ Ensuring that credentials are aligned to the current body of knowledge for an occupation



Complementary but Separate Programs

ANAB
ANSI National Accreditation Board

- Assesses against an American National Standard and/or ISO Standard, or other programmatic requirements
- Must comply with ISO/IEC 17011 and remain neutral, objective, and impartial
- Does not provide consultancy

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- Maintains separation from and respects the impartiality of the ANSI National Accreditation Board
- Educates stakeholders about quality credentials, when credentials are appropriate and how they fit in career pathways
- Consults regarding:
  - building quality credentials (which includes conformity to accreditation standards)
  - evaluating credentials
  - identifying, aligning, and appropriately stacking credentials
- Conducts research to address industry and public needs

THE U.S. POST-SECONDARY CREDENTIALING SYSTEM

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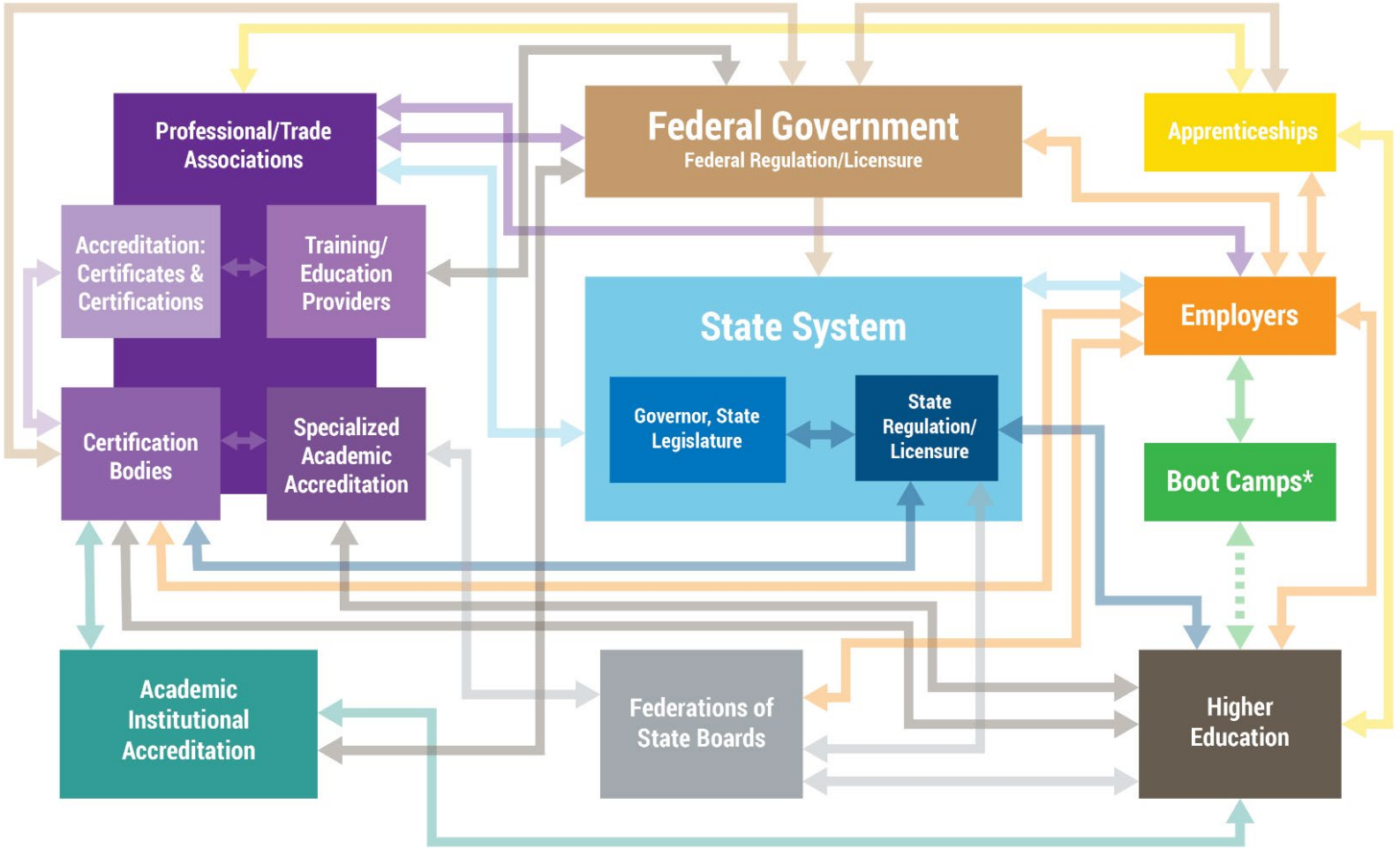

* Although boot camps initially existed outside of the higher education system, there is increasing interest of universities to develop partnerships with boot camps.

Standards: A Foundational Component of Quality Credentials

- Many people are familiar with certificate, certification, and workplace learning programs, but they often lack information on how to distinguish **quality** programs from those of lesser value.
- Standards ensure the safety, quality, value, and reliability of products and services, including credentials.
- Until recently, there were only standards to guide the development of personnel certifications and assessment-based certificates, leaving a gap in quality for workplace learning programs.

Workplace Learning Programs

In December 2023, ASTM international published a new standard – ASTM E3416-23: *Standard Practice for Competency-based Workplace Learning Programs*.

Comprehensive, balanced, and effective standards guiding personnel certifications, assessment-based certificates, and workplace learning programs make up a 'quality triangle' to enhance learning outcomes that can meaningfully elevate a skilled workforce in the U.S.

Skills-Based Hiring

- There is a difference between qualifications and skills.
  - ➢ A qualification is a type of credential or experience, such as:
    - Degree
    - Certificate
    - Certification
    - Apprenticeship
    - Training
    - Experience on the job
  - ➢ A skill is the specific actions that a person can perform to demonstrate an ability, such as:
    - Articulate ideas clearly so they are understood by a wide variety of audiences
    - Evaluate a situation, identify a problem, and present a plausible solution
    - Analyze a data set and draw appropriate conclusions
    - Operate a piece of machinery to obtain a desired result

Skills-Based Hiring Continued

- It is more difficult to assess and establish metrics for determining if a skill has been achieved.
- There is a need for validated assessment tools in order to successfully achieve skills-based hiring.
- There are implications from this practice for the standards community as well.

For More Information

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YouTube: youtube.com/@workcred
Point of View: blog.ansi.org/workcred/

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