

September 11, 2023 | 11:30 AM – 12:15PM

DRIVING INNOVATION

Power of Data Governance on Packaging Lines

PACK EXPO Las Vegas - The Forum

By Spencer Cramer

Your Speaker

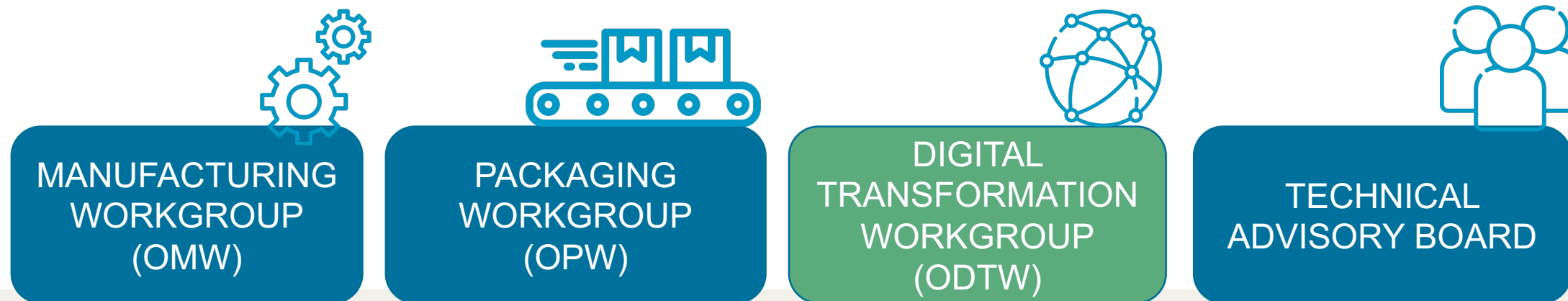
- 40 years in automation, packaging and converting
- Founder and CEO of ei3 – a leading Industrial IoT and AI provider
- Chairman of the board at OMAC
- Board member at Sustainable Real Estate Solutions
- Passionate about preserving our beautiful planet



OMAC : Transforming and Simplifying Automation for the World's Future, Today

OMAC fosters collaborative thought leadership, standards and support for automation professionals, enabling their organizations to save time, money and resources.

This opens doors for innovation, exemplifying our commitment to our vision. One avenue through which we're realizing this vision is the Digital Transformation Workgroup.



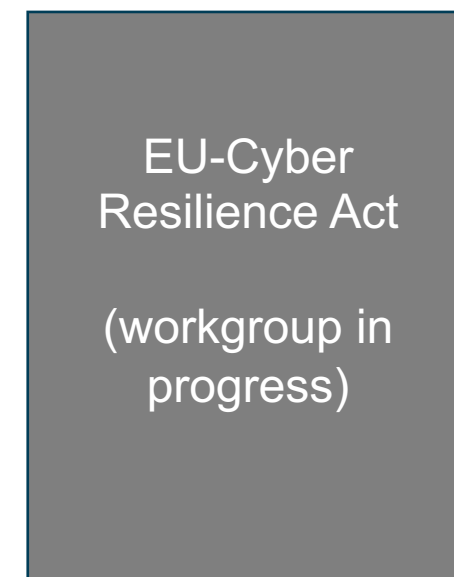
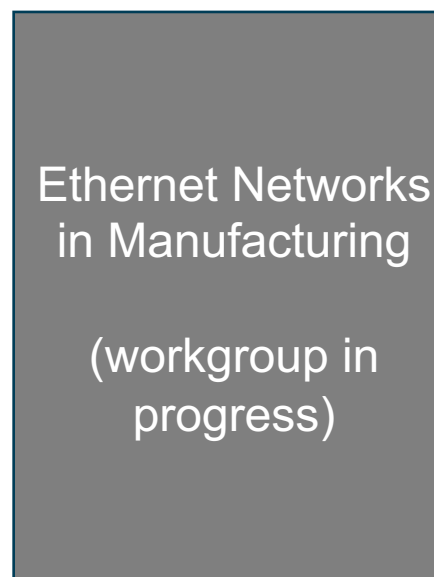
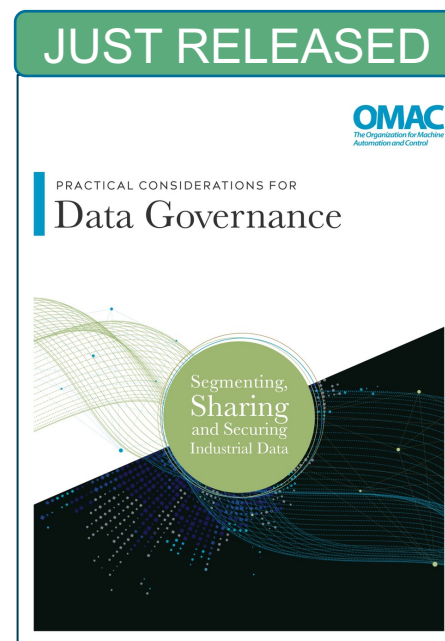
Today's Topic

Power of Data Governance on Packaging Lines

- 1) Present the OMAC Digital Transformation Workgroup toolkit
- 2) Explore the need for Data Governance
- 3) Review the recently published Data Governance Report
- 4) Workshop value creation from good Data Governance
- 5) Example of Data Governance solving a classic problem
- 6) Wrap up

ODTW Vision: Acceleration toolkit

A Library of Tools & Practical Guides for Digital Transformation



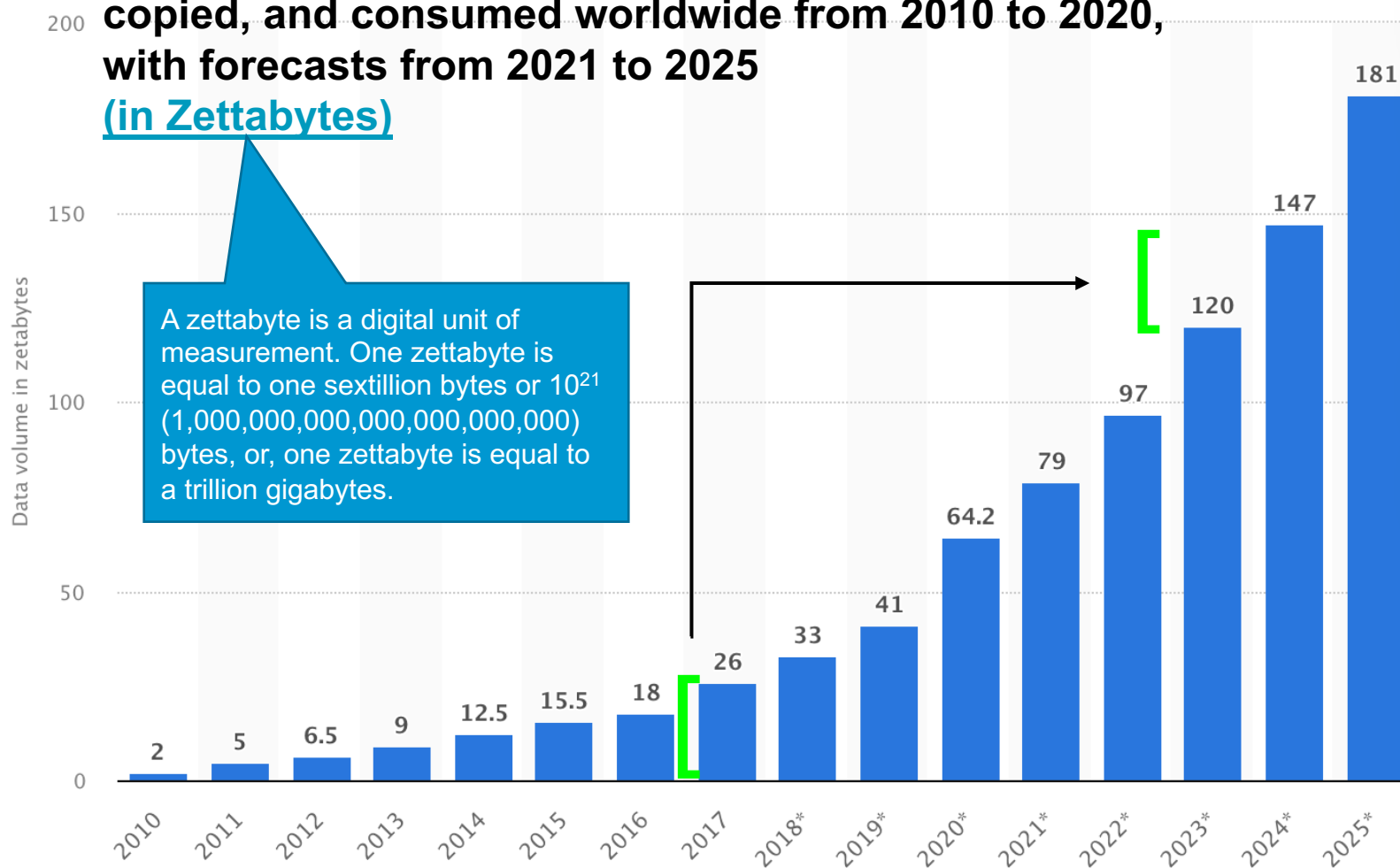
— Industry-Neutral
— Multi-Vendor Supported

— Technology Agnostic
— Encompasses Diverse Participant Expertise

Data Drives the World

Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2020, with forecasts from 2021 to 2025

(in Zettabytes)



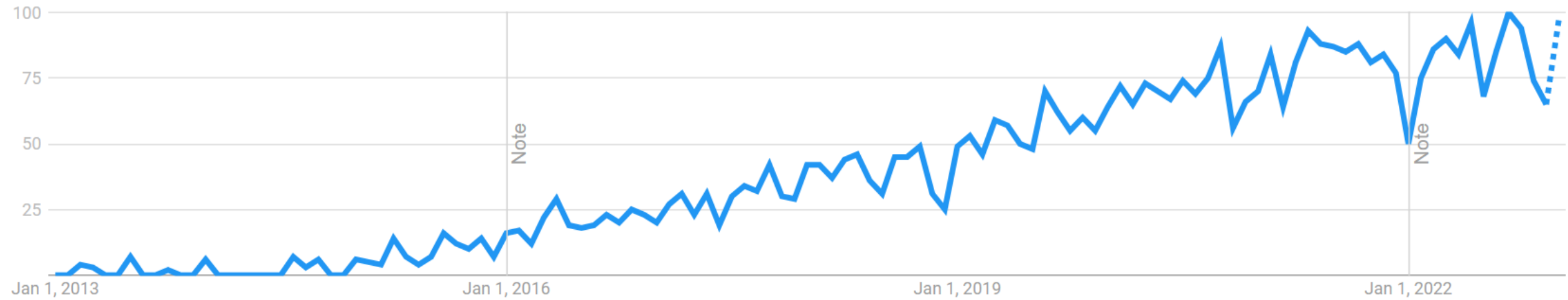
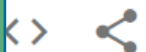
A zettabyte is a digital unit of measurement. One zettabyte is equal to one sextillion bytes or 10^{21} (1,000,000,000,000,000,000,000) bytes, or, one zettabyte is equal to a trillion gigabytes.

Cross-industry studies show that on average, less than half of an organization's structured data is actively used in making decisions.

Data is needed for Digital Transformation



Interest over time



Data Tension



Result = “Analysis Paralysis”

Organizations avoid making decisions and can't capture the valuable opportunities

A New Mindset for a New Opportunity

Digital Transformation requires expanded data use

- Successful organizations use a change management framework
- Agreed shared best practices
- And they have a defined approach to **Data Governance**

Big thank you to
Mark Fondl & Richa Patel
who worked hard with the
team to create the report



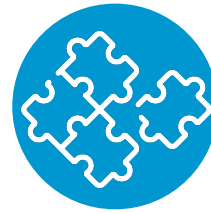
53 leaders representing 35 firms collaborated
over 24 weeks to compile their insights into an
actionable, user-friendly guide



Data Governance Topics Covered



A Common Data Dictionary
and Language



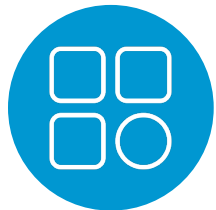
Key Components of
Plant Floor Data



Types and Sources of Data
in Manufacturing



Organizations and
Standards to Consider
for Data Governance



Applications that Utilize
Plant Floor Data



Data Storage and
Compliance



Individuals, Organizations, and
Companies that Use the Data

Common Data Dictionary & Language

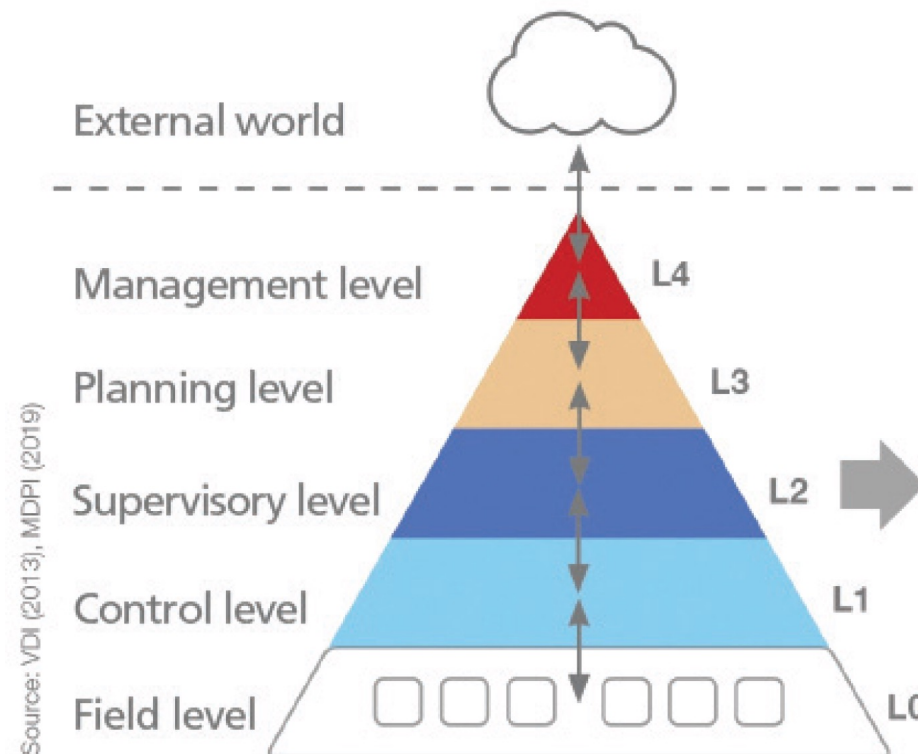
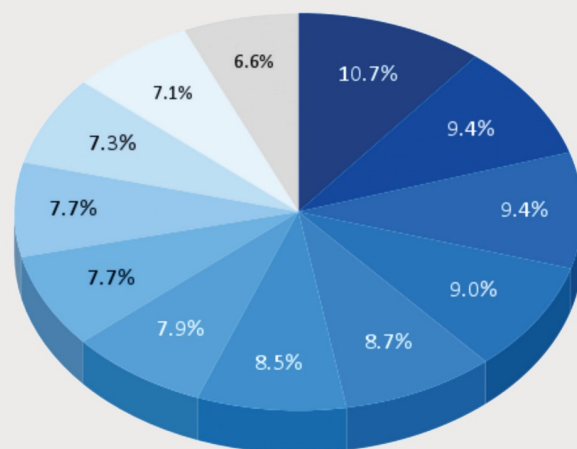
- Helps to use the same data for different applications
- Avoid misunderstanding of data, generating wrong information
- Promotes sharing of data within and across organizations

Raw Data, Real Time Data, Continuous Data, Analog Data, Discrete Data, Diagnostic Data, Processed Data, Cleansed Data, Historical Data, Metadata, Time-based Data, Culling data... and more

Types and Sources of Data

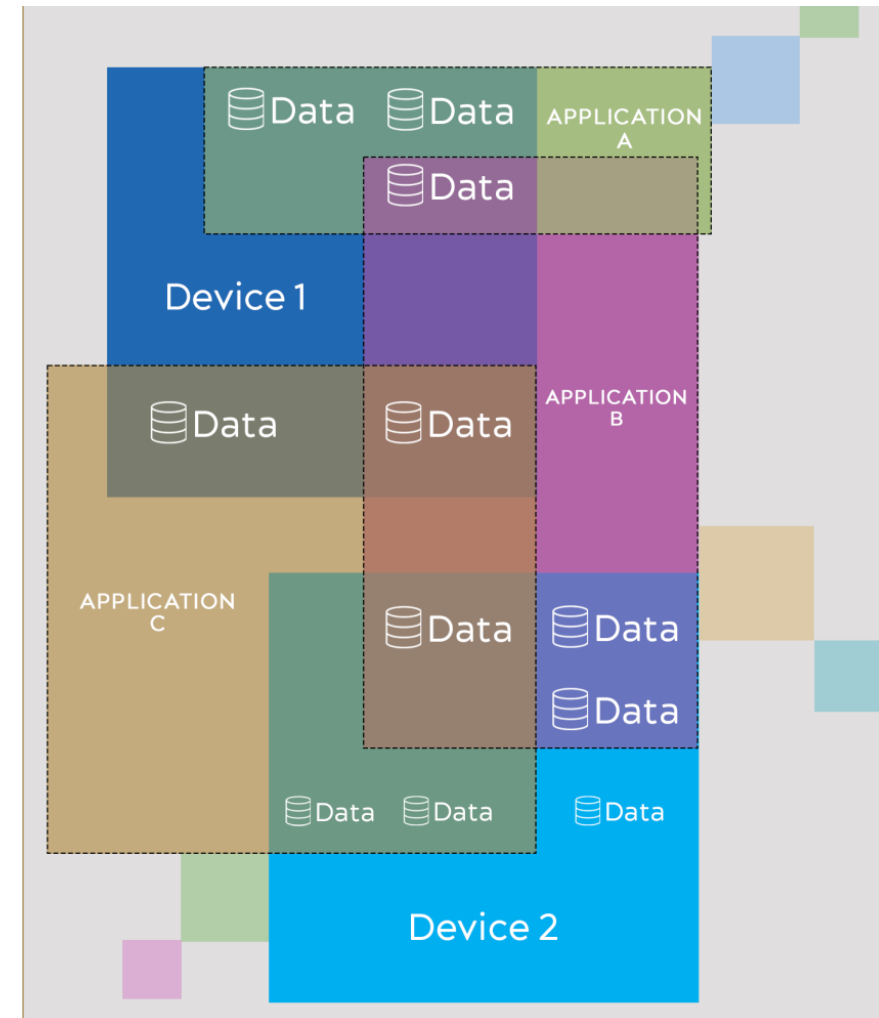
- Sources that produce data
- Purdue Model Hierarchy
- Reliability and dependability
- Evolution of connectivity
- Possible issues in transmission

- PLC or Process Controller
- PC Based Control device
- SCADA System
- Edge Computer
- Test & Measurement system
- IIoT Device
- Intelligent device
- Operator Interface or HMI
- Infrastructure
- RTU
- Isolated OEM Systems
- Sensor connected to an input/output



Applications

- Types of Applications, Classifications
 - Batching, Supervision, Scheduling, Optimization and Performance, M2M, Quality, Maintenance, Historians. Alarming, Planning and Scheduling.
- Integration of Applications

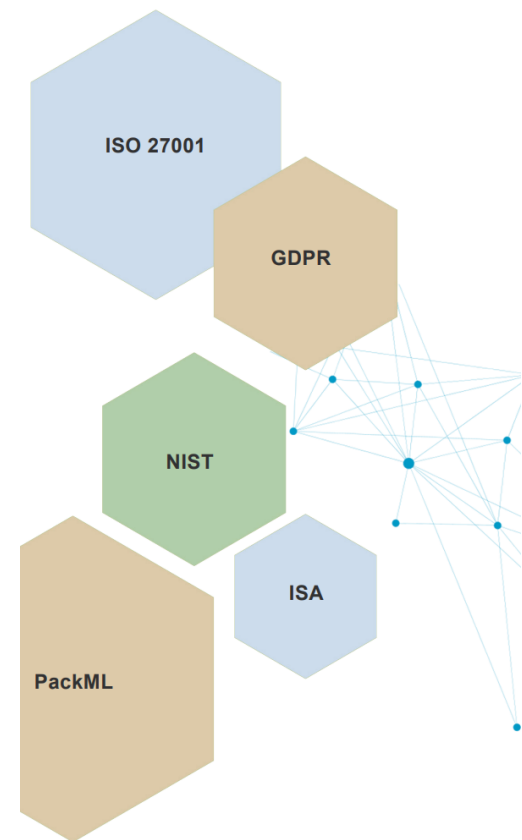


Key Components of Plant Floor Data

- How to create structures for data access
- Information = Data with Context
- Conventions and Naming Attributes
 - *Naming attribute, descriptive attribute, and referential attribute*
 - *Associated attributes could be based on the time*
 - *Engineering units, scaling, alarm thresholds.*
 - *Manufacturer ID / model with revision stamp*
 - *OEE type diagnostic attributes*
 - *Associated by users, machine types, process type*

Organizations and Standards

- PackML Standard
- Supervisory Control Standards
 - OPC, OPC/UA
- Industry-Specific Standards
 - Weihenstephan Standards
 - cGMP (current Good Manufacturing Practice)
- Security Standards and Organizations
 - NIST
 - Cybersecurity & Infrastructure Security Agency
 - General Data Protection Regulation
 - International Organization for Standardization

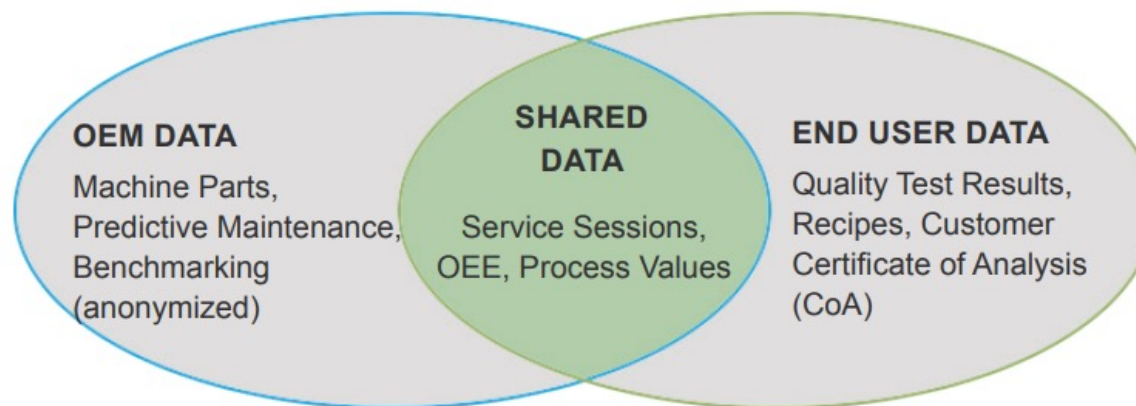


Storage, Compliance & Handling

- Local Data Storage in the Data Lake
- Data Protection for Cloud Environments
- Cloud Services
- Edge Devices
- Hybrid Models
- Bandwidth and Security

Individuals, Organizations, Companies

- Ownership
- Proprietary
- Data Sharing



Public: Data that can be freely used and shared, with no restrictions on access or usage.	Internal: Data with low security requirements but is restricted to internal employees.
Confidential: Data which is restricted to use by specific people or groups. IP-protected data can belong to this category.	Restricted: Highly sensitive internal data. Disclosure of such data could put the organization at risk.

End User	OEM	Tech Provider	Systems Int.
Formulas Speeds Production runs	Machine Tuning Part use & condition Diagnostics Logs	Fault codes Environment	Application Software Version control Change logs
Configurations Recipes Quality results	Remote Access Maintenance logs Service history	Device Version Update history	Remote Support Connection details

Data Sharing Is a Business Necessity to Accelerate Business Growth

Data and analytics leaders who share data externally generate **three times more economic benefit** than those who do not.

Gartner[®]

Survey of Chief Data Officers May 2021

WORKSHOP

DATA - to - VALUE

	End User 6	OEM 1	Tech Provider 3	Systems Integrator 5
CAN SHARE	Failure analysis OEE	Energy usage data Uptime Environment waste	Servo temp	Access Change log
CAN NOT SHARE	Product recipes			

CHALLENGE: How to deliver Predictive Alerts

End User = Machine Owner

PLC = machine data source



OEM = Machine Builder



Company
Won't share
machine data

OEM Applications
Service Team

Knows how to predict
failures and wants to
sell algorithms to the
end customer

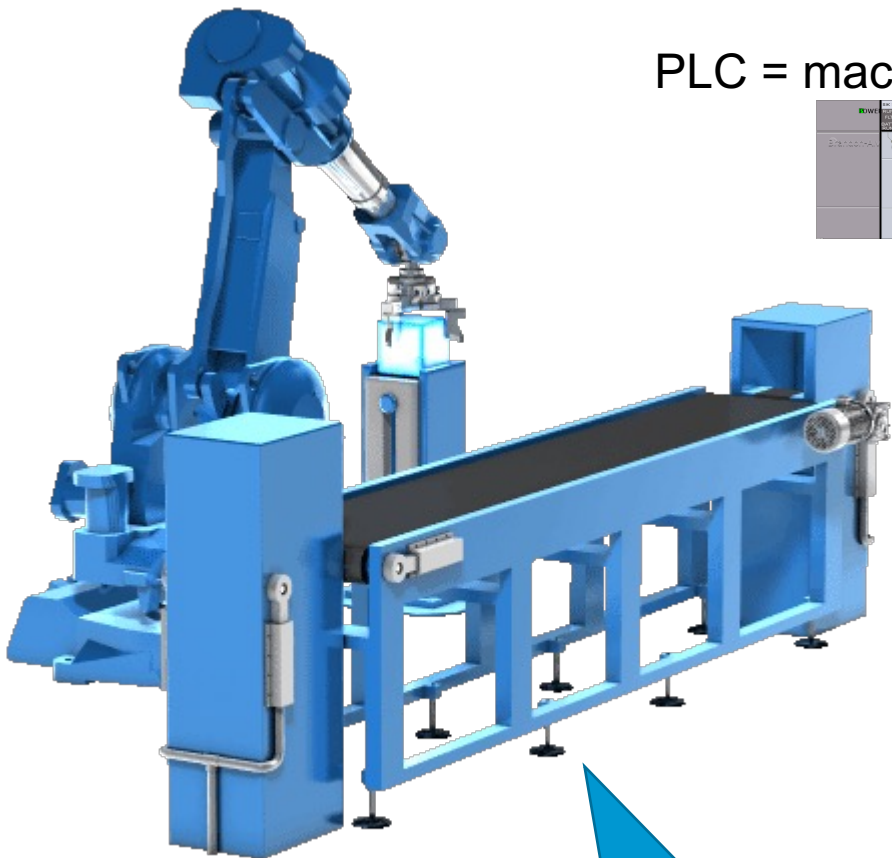
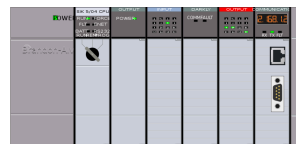
Robot needs
maintenance

Predictive Maintenance Opportunity : Too Much

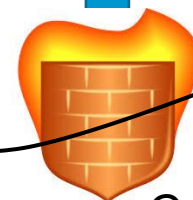
End User = Machine Owner

OEM = Machine Builder

PLC = machine data source



Robot needs
maintenance



Company
Firewall

OEM Applications
Service Team
Gets all machine data
and analyzes
operations to send
parts or service the
machine

If all data is shared, that
will be too much

Predictive Maintenance Opportunity : Too little

End User = Machine Owner

PLC = machine data source



OEM = Machine Builder



Company
Firewall



OEM Applications
Service Team

Let in the dark – they
don't know how the
machine is being used
in the field

If no data is shared, that
might be too little

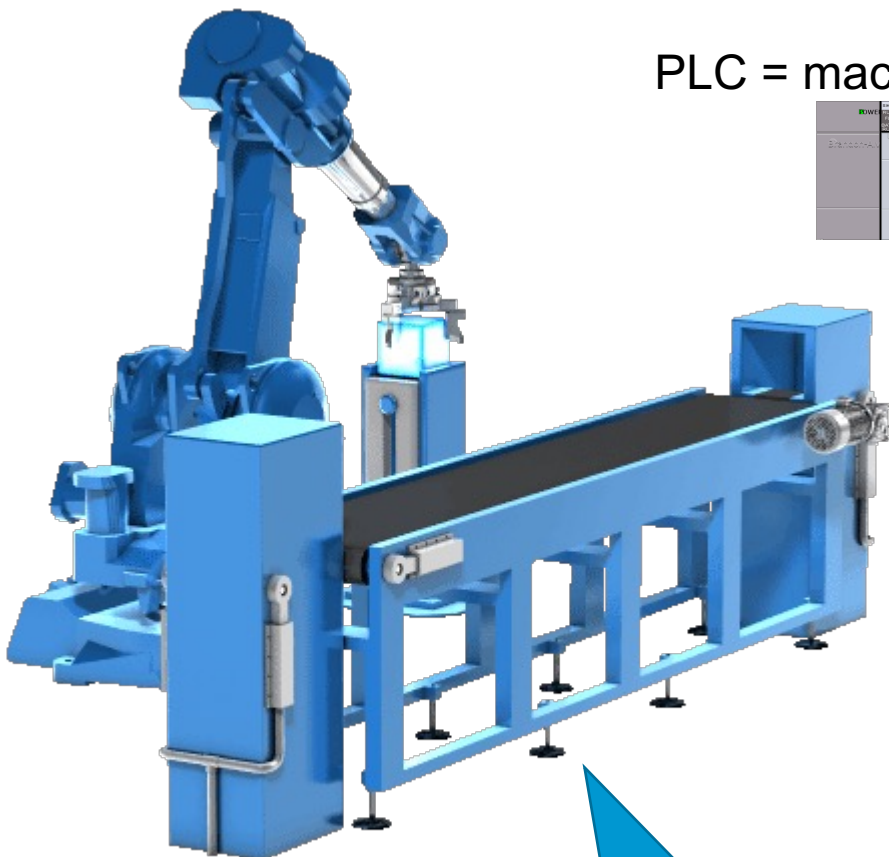
Robot needs
maintenance

Predictive Maintenance Opportunity : Edge Device

End User = Machine Owner

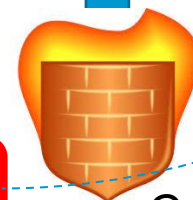
OEM = Machine Builder

PLC = machine data source



Robot needs
maintenance

Edge Device



Company
Firewall



OEM Applications
Service Team
Knows the machine
and can develop rules
that could be locally
applied

LOCAL EDGE DEVICE RULES

- Machine speed (no product knowledge)
- Weight (no need to know the material)
- Other Factors

Compiled into Edge Device Algorithm

Predictive Maintenance with CFL

End User = Machine Owner

PLC = machine data source



OEM = Machine Builder
> Alerts, sanitized
key data

< Rules
Algos

**OEM Applications
Service Team**

Receives predictive
alerts from fleet of
machine and is able to
provide predictive
maintenance services
to the end users.

Edge Device

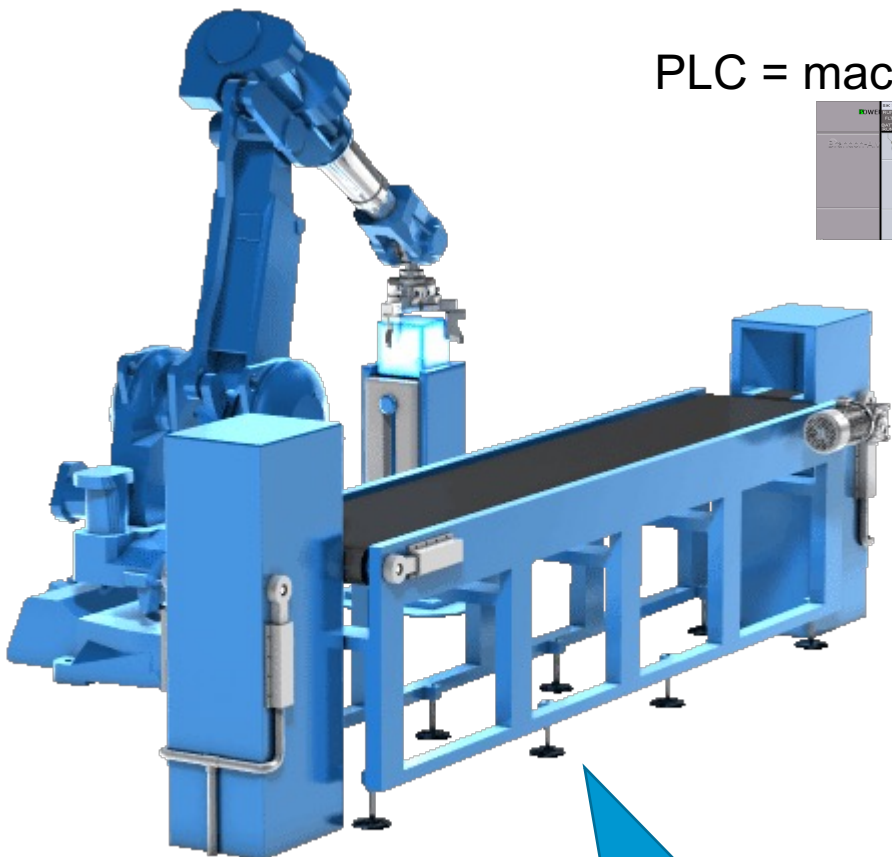
Company
Firewall

Act locally on
Analytic rules

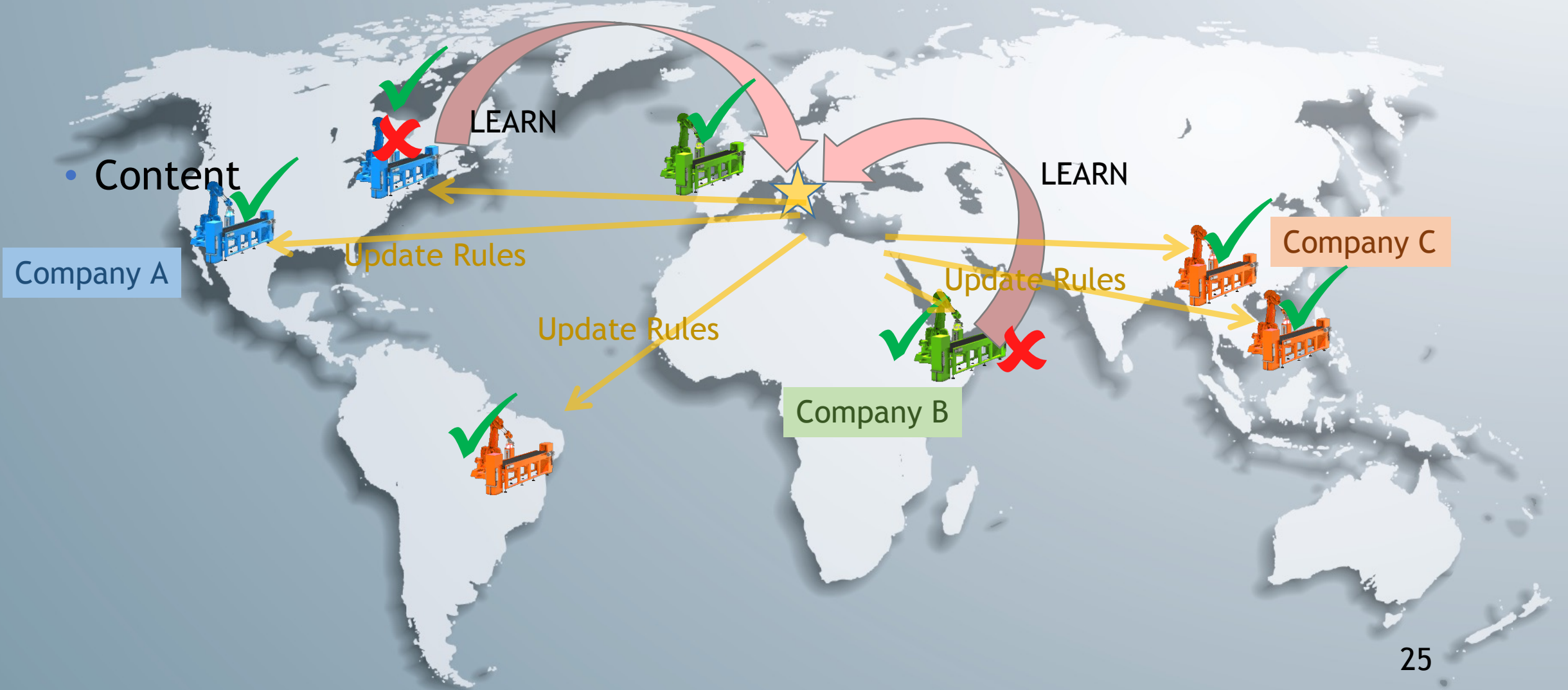
Robot needs
maintenance

PREDICTIVE MAINTENANCE

- The OEM determines rules to be run locally on the machine side edge device
- Rules are updated as OEM learns more about the machine
- The rules are processed locally
- Only the output of the rules are sent back to the OEM



CFL with a global fleet of equipment



CFL is possible with an IIoT Provider

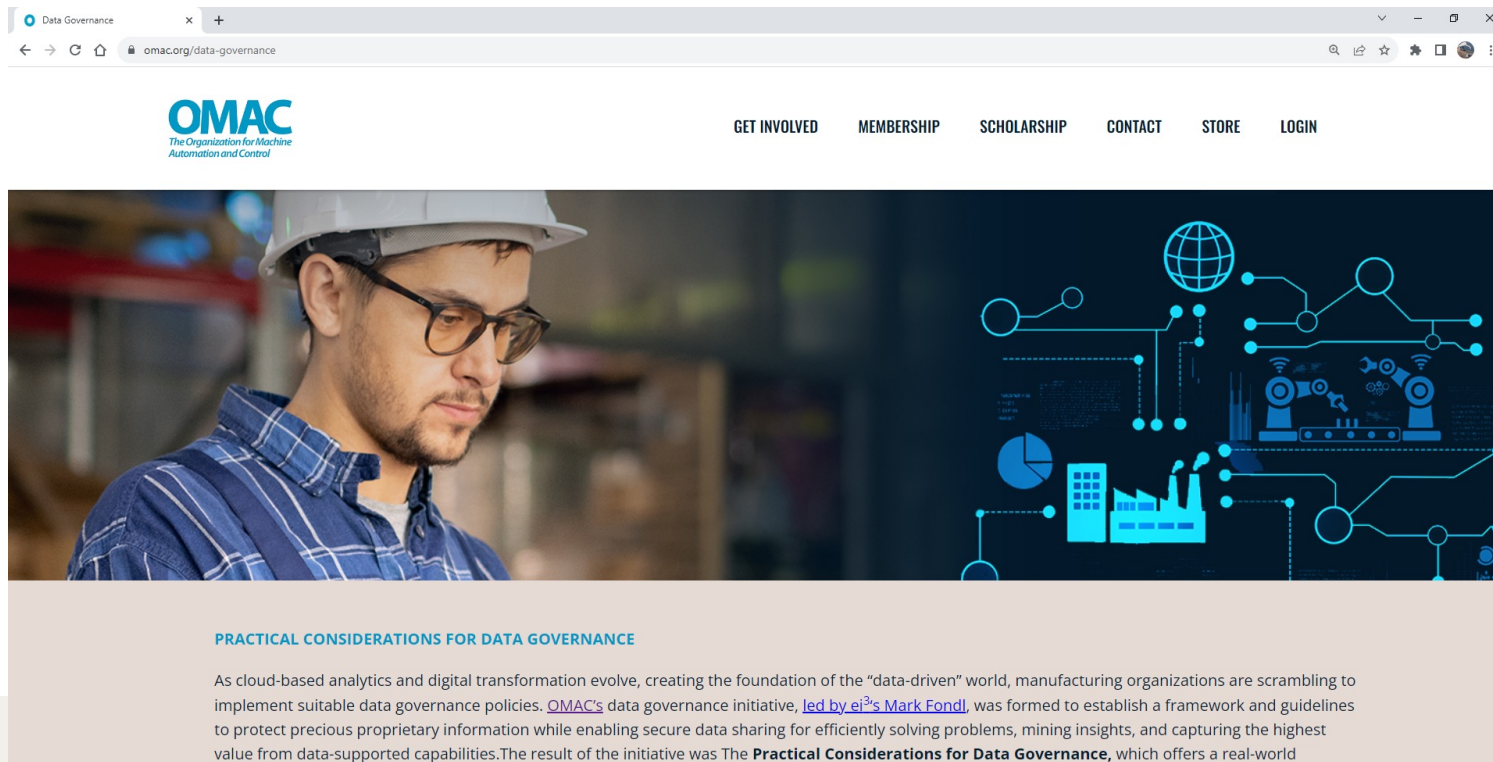
- Not Public Cloud, not End User in-house, not OEM In-house
- A neutral 3rd Party allows for multi-vendor and legacy solutions
- A neutral 3rd Party can administer a total solution
- Experienced with Data Governance
- Can help organizations structure and enforce multiple roles
- Will have terms, insurances, certifications, and practices
- The 3rd party IIoT provider delivers the quadruple benefit :
 - Save Time,
 - Save Money,
 - Stay Current,
 - Be Focused
- Something to think about....

Recap of the session

- Data is needed for Digital Transformation
- The Benefits & Risks are complex & lead to “Analysis Paralysis”
- Organizations should have a Data Governance defined
- OMAC created a Data Governance document to help
- Governance allows companies to share data and contribute
- Practical methods are in use today

Get your copy

- [OMAC.org/data-governance](https://omac.org/data-governance)
- Free for OMAC members



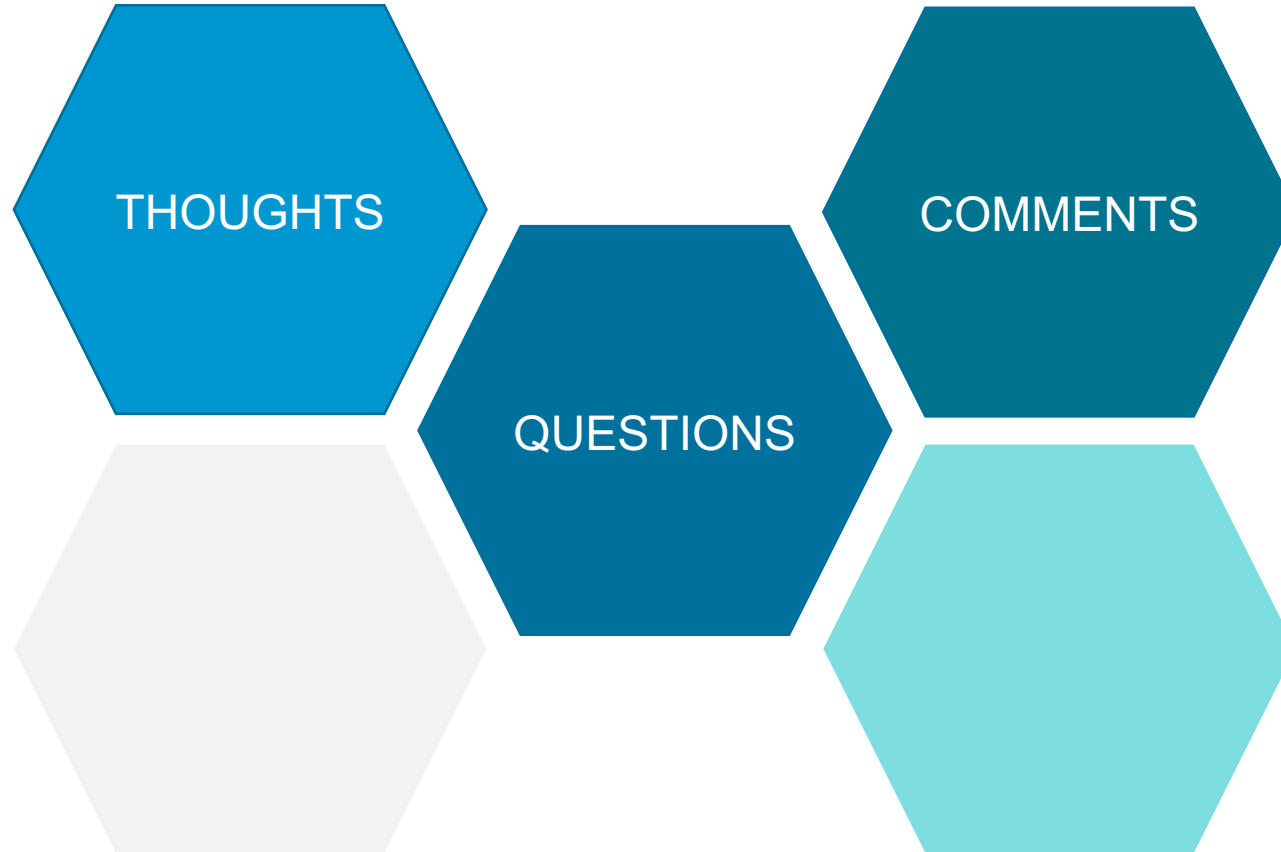
OMAC
The Organization for Machine
Automation and Control

GET INVOLVED MEMBERSHIP SCHOLARSHIP CONTACT STORE LOGIN

PRACTICAL CONSIDERATIONS FOR DATA GOVERNANCE

As cloud-based analytics and digital transformation evolve, creating the foundation of the “data-driven” world, manufacturing organizations are scrambling to implement suitable data governance policies. [OMAC's](#) data governance initiative, [led by ei³'s Mark Fondl](#), was formed to establish a framework and guidelines to protect precious proprietary information while enabling secure data sharing for efficiently solving problems, mining insights, and capturing the highest value from data-supported capabilities. The result of the initiative was The **Practical Considerations for Data Governance**, which offers a real-world

Discussion



OMAC General Meeting

Tomorrow September 12th at 10AM
Room N-240

- Engage with the OMAC Board of Directors and fellow members
- Stay updated on crucial organization developments
- Discover the latest updates from our Packaging, Manufacturing, and Digital Transformation Workgroups
- Celebrate our scholarship winners
- Explore accomplishments, activities, and future prospects



A network diagram background consisting of a complex web of thin white lines connecting various circular nodes. The nodes are in shades of blue, white, and grey, scattered across the blue background. Some nodes are highlighted with a white border.

OMAC

*The Organization for Machine
Automation and Control*

Thank you!

Spencer Cramer
spencer@ei3.com