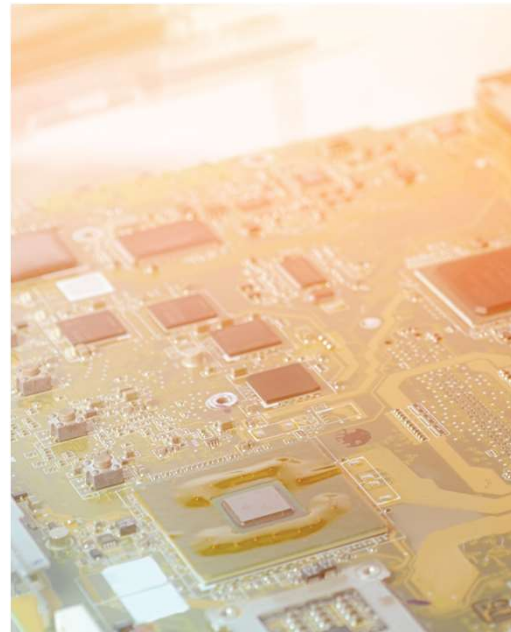


# Traceability 4.0

## A Fundamental Element of Success in the Age of Industry 4.0

Eric Henefield

Global Director – Traceability Solutions Business



# Agenda

- What is Traceability?
- Traceability Drivers
- Traceability Evolution / Traceability 4.0
- Traceability Standards and Regulatory Mandates
- The MVRC Traceability Deployment Methodology  
**Mark – Verify – Read – Communicate**
- Journey to Traceability 4.0

# What is Traceability?

## Traceability

---

From Wikipedia, the free encyclopedia

**Traceability** is the capability to trace something.<sup>[1]</sup> In some cases, it is interpreted as the ability to verify the history, location, or application of an item by means of documented recorded identification.<sup>[2]</sup>

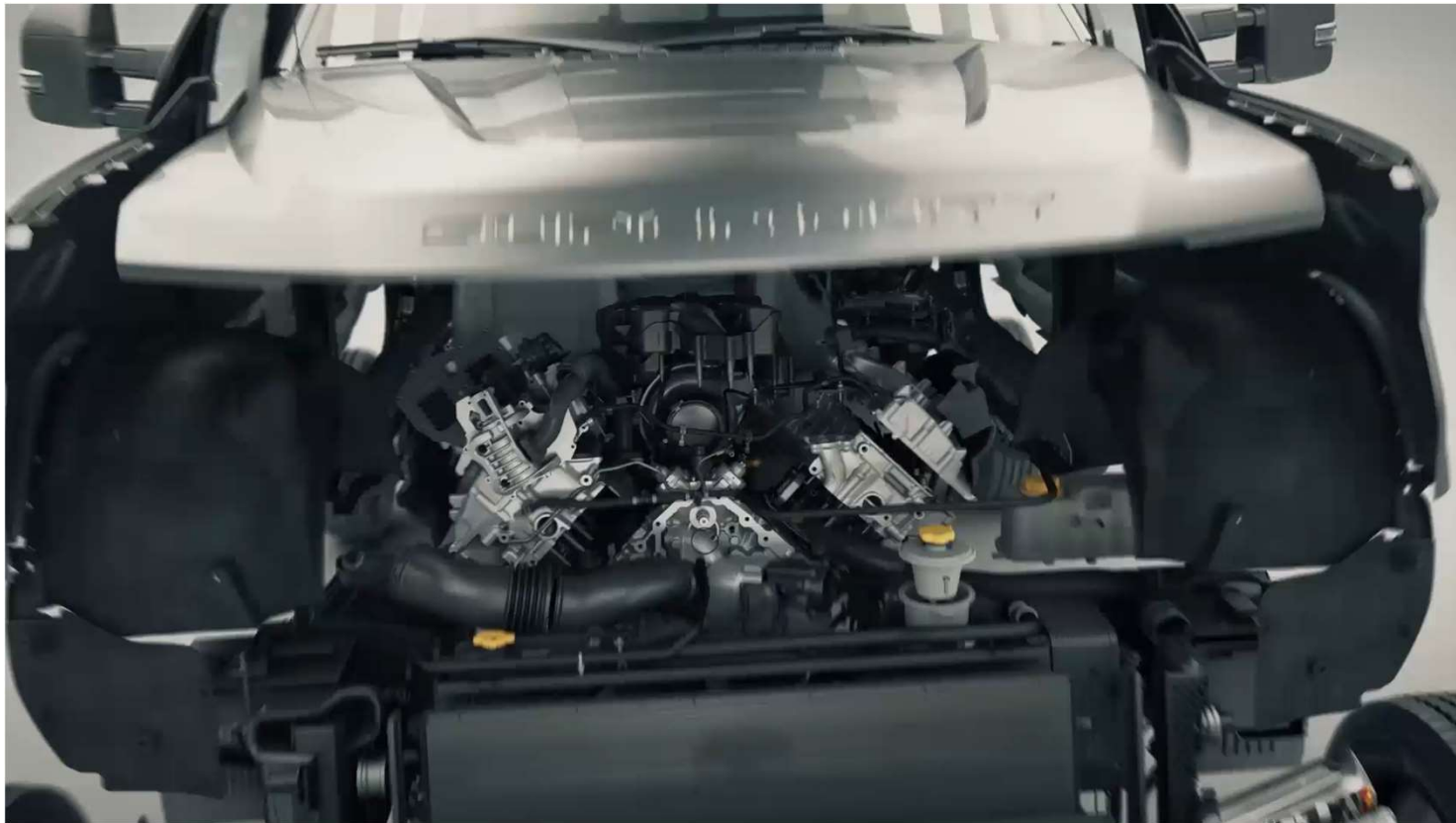
Other common definitions include the capability (and implementation) of keeping track of a given set or type of information to a given degree, or the ability to chronologically interrelate uniquely identifiable entities in a way that is verifiable.

Traceability is applicable to measurement, . supply chain, software development, healthcare and security.



**Omron Traceability Solutions = Discrete Manufacturing Transparency**

# Track, Trace and Control



# Agenda

- Traceability Drivers
- Traceability Evolution / Traceability 4.0
- Traceability Standards and Regulatory Mandates
- Traceability Standards and Regulatory Mandates
- The MVRC Traceability Deployment Methodology  
**Mark – Verify – Read – Communicate**
- Journey to Traceability 4.0

# Market Trends/Pain Points: Key Traceability Drivers



To create a broad variety of safe, secure and high quality products, manufacturing based on "line-item traceability" is essential

# Automotive Recall Example: Air Bag Inflators

More than

**124million**

recalls worldwide to date

**55+**

separate car manufacturers affected by the recall

**\$1billion**

obligation of the company under the DOJ plea agreement in the United States; \$850M in funds for the victim OEMs; \$150M for personal injury and wrongful death claimants

**2002 - 2015**

span of time during which most of the airbag inflators in question were installed

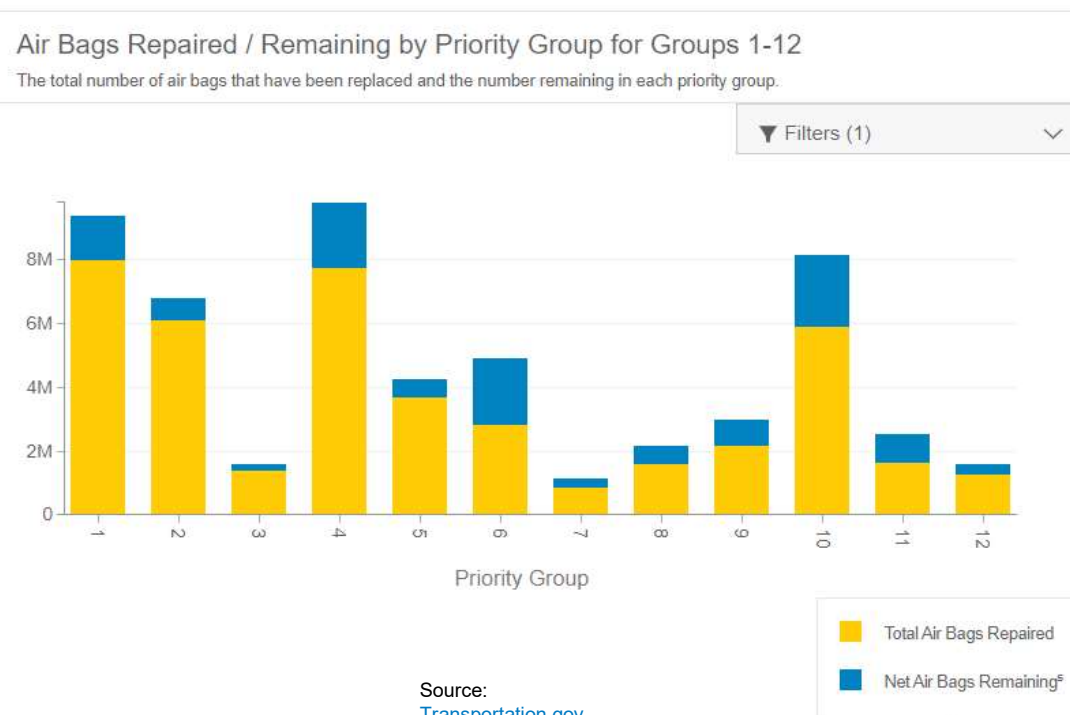
**\$47billion**

of claims asserted in the Chapter 11 cases from the car manufacturers to cover the costs of the recalls and indemnification for economic loss to the business

¥

billions of yen in unsecured claims associated with recalls in Japan

Source: NHTSA



**Millions remain in vehicles that are still in service today**

# Industry 4.0 – Mega Trends

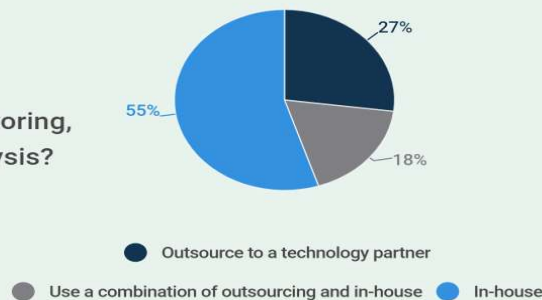
**Trend #1** Predictive maintenance advances to further identify potential machine issues before they fail - reducing downtime and increasing productivity.

In a recent Industrial Maintenance Study, respondents were asked what the benefits of implementing a predictive maintenance strategy were.



**Trend #2** Remote monitoring and predictive analytics for real-time decision making.

How will manufacturers implement remote monitoring, data collection and analysis?



\*Trend data courtesy of Advancedtech

**Trend #3** Communication technologies and 5G networking will allow manufacturers to install more sensors at scale for a bigger picture of machine health.

A recent Sensor Technology Study showed that...

56%

OF MANUFACTURERS ARE USING AT LEAST SEVEN DIFFERENT TYPES OF SENSORS

86%

OF MANUFACTURERS ARE USING AT LEAST FIVE OR MORE SENSORS

**Trend #4**

Digital twin technology to increase consistency and productivity of a component or machine in the factory.

**Trend #5**

Monitoring technologies can be used to check employee temperatures and their location on the factory floor further benefiting health and safety.

**Trend #6** Flexibility and agility within the supply chain

To master the shorter product life cycles and volatile business environments, supply chains will build agility across the chain.

Supply chains can become agile by focusing attention across five functions.

PRODUCTION

CAPITAL ASSET

PURCHASING

PRODUCT DEVELOPMENT

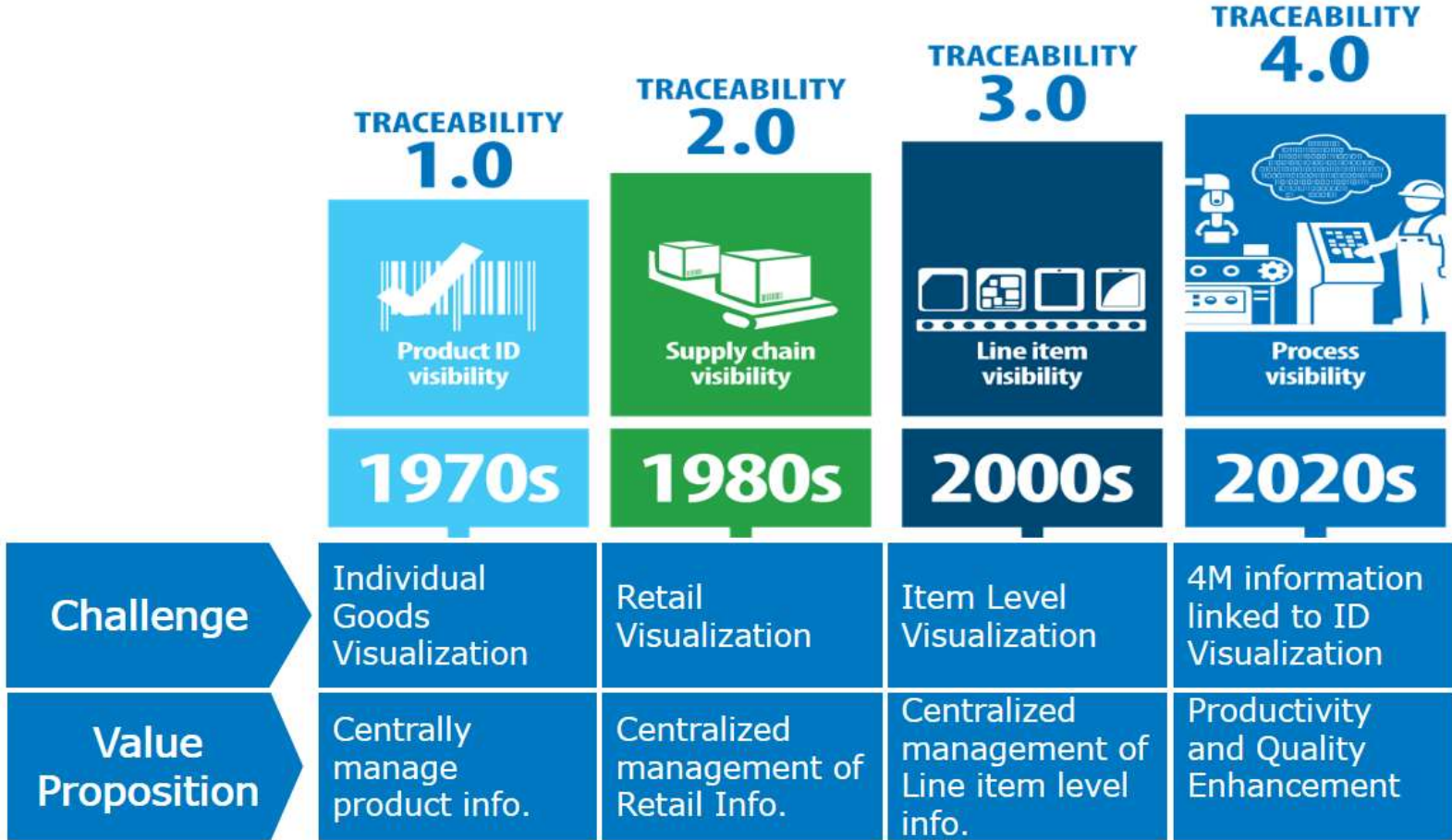
PLANNING



# Agenda

- Traceability Drivers
- [Traceability Evolution / Traceability 4.0](#)
- Traceability Standards and Regulatory Mandates
- The MVRC Traceability Deployment Methodology  
**Mark – Verify – Read – Communicate**
- Journey to Traceability 4.0

# Traceability Evolution



# Item Level Traceability

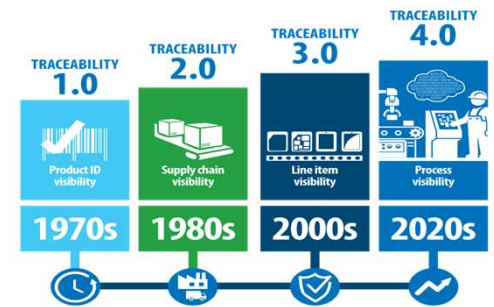
## Objectives:

- Part genealogy
- Counterfeit prevention
- Reject tracking
- “Spill” containment
- Assembly error proofing
- Selective pairing of components
- Process visibility, optimization & control

⇒ Traceability 4.0

## Applicable for:

- Production
- Quality
- Supply chain
- Throughout product’s lifecycle



Combine part, process, equipment, operator and environmental data to create a full view of performance and enable the next level of optimization.

[“4M Analysis” methodology combining “HuMan”, “Machine”, “Method”, “Material” data]

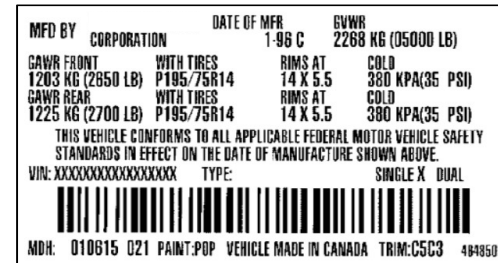
## Agenda

- Traceability Drivers
- Traceability Evolution / Traceability 4.0
- [Traceability Standards and Regulatory Mandates](#)
- The MVRC Traceability Deployment Methodology  
**Mark – Verify – Read – Communicate**
- Journey to Traceability 4.0

# Standards & Regulations for Various Industries

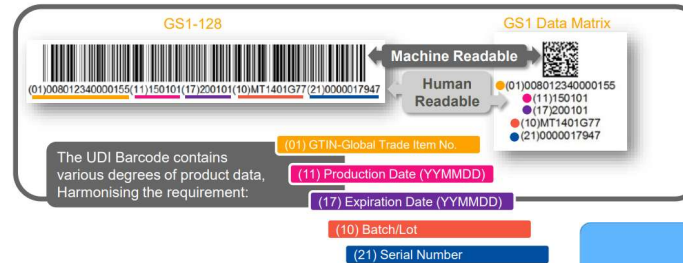
- Automotive

- DPM requirements (AIAG, ATA, NASA)
- Label requirements (Federal CFR, AIAG, Odette, VDA, GTL)
- Vehicle Safety Certification (VSC) Labels



- Life Sciences

- GS1 UDI (Unique Device Identification)

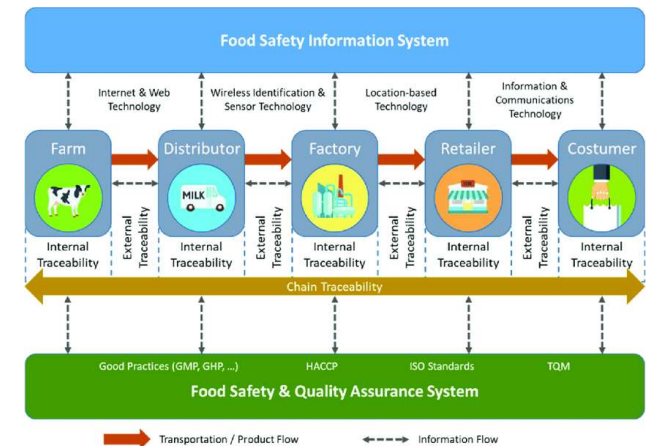


- Food & Beverage

- GS1 GTS (Global Traceability Standards)
- FSMA

- Digital/Semiconductor

- SECS/GEM - defines messages, state machines and scenarios to enable factory software to control and monitor manufacturing equipment



## Agenda

- Traceability Drivers
- Traceability Evolution / Traceability 4.0
- Traceability Standards and Regulatory Mandates
- **The MVRC Traceability Deployment Methodology**
  - **Mark – Verify – Read – Communicate**
- Journey to Traceability 4.0

# T3.0 - OMRON MVRC Traceability Deployment Methodology

M

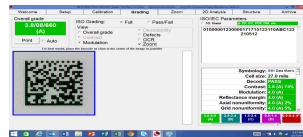
MARK



Select the right marking/printing process and process parameters for the application

V

VERIFY



Use off-line and/or in-line verifiers to check/monitor mark/print quality

R

READ



Select proper reader configurations for the application

C

COMMUNICATE



Communicate with data management system

# Sample Traceability System Implementation



<https://www.youtube.com/watch?v=VK0WU0Gu4Tg&t=1s>





# T3.0 - OMRON MVRC Traceability Deployment Methodology

M

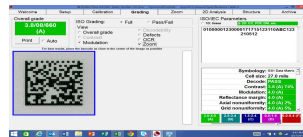
MARK



Select the right marking/printing process and process parameters for the application

V

VERIFY



Use off-line and/or in-line verifiers to check/monitor mark/print quality

R

READ



Select proper reader configurations for the application

C

COMMUNICATE



Communicate with data management system

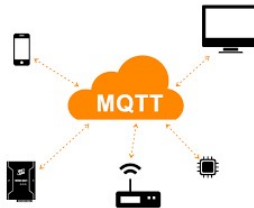
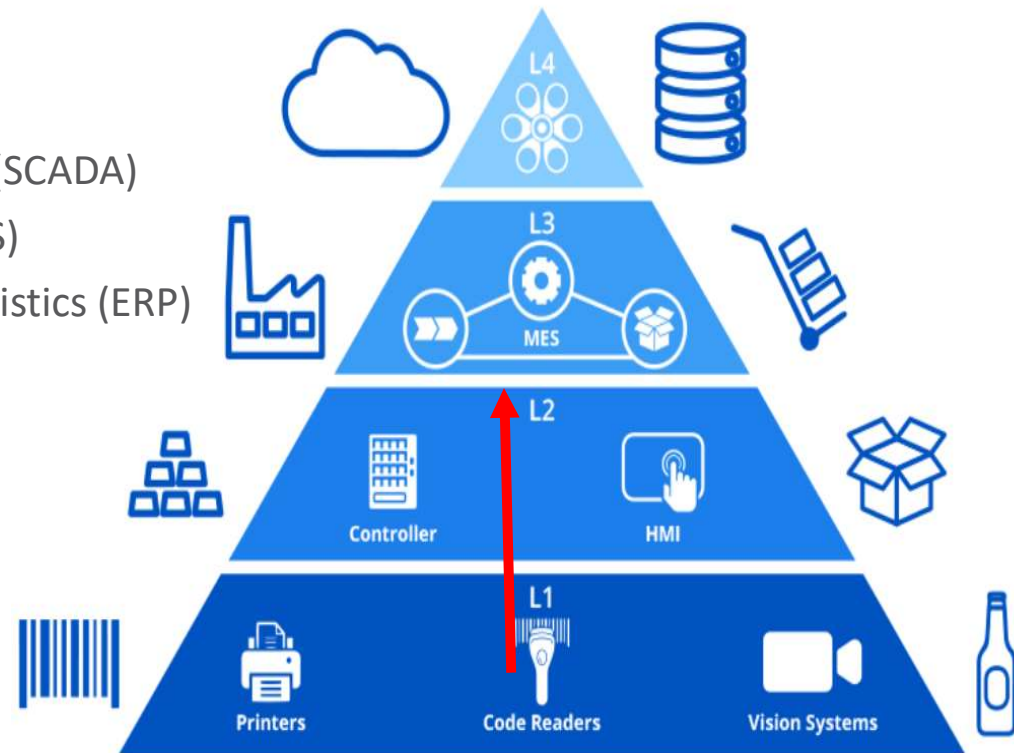
# Agenda

- Traceability Drivers
- Traceability Evolution / Traceability 4.0
- Traceability Standards and Regulatory Mandates
- Traceability Standards and Regulatory Mandates
- The MVRC Traceability Deployment Methodology  
**Mark – Verify – Read – Communicate**
- [Journey to Traceability 4.0](#)

# Manufacturing Levels of Operations

## Manufacturing Levels Overview

- Level 1 (Mfg Line) = Devices
- Level 2 (Plant) = Monitoring and Supervising (SCADA)
- Level 3 (Business Unit) = Mfg Operations (MES)
- Level 4 (Enterprise) = Business Planning & Logistics (ERP)



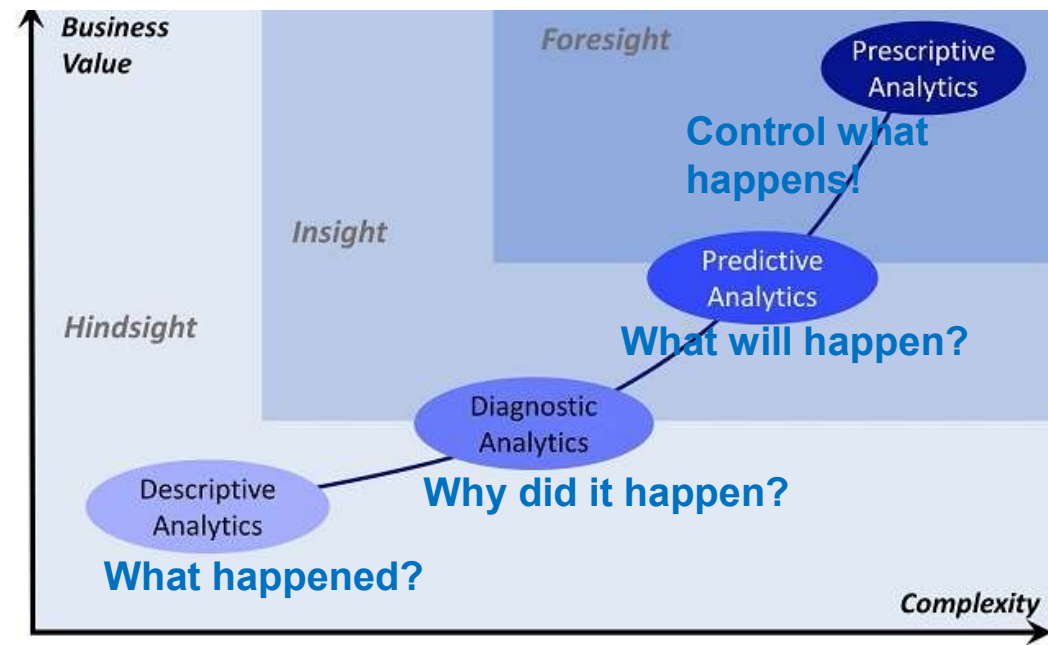
# Leverage data to make informed decisions in real time

## BIG DATA

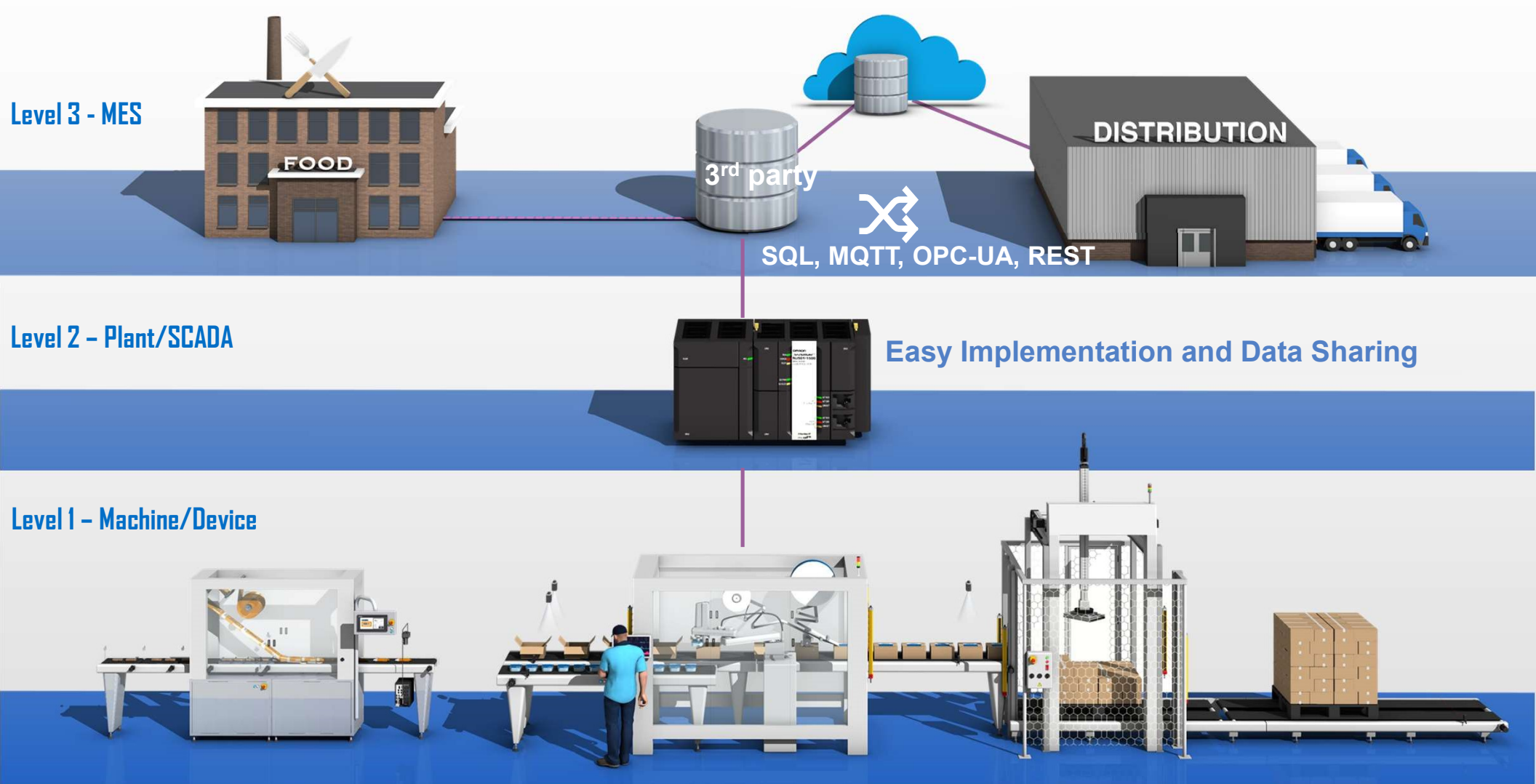


### Communicated Data = Value

- Quality assurance / Root cause analysis (All)
- Counterfeit prevention
- Regulatory compliance
- Supply Chain transparency
- Scrap reduction
- Productivity improvements (OEE)
- Demand forecasting (inventory mgmt.)
- Predictive/prescriptive maintenance



# Traceability Solutions Overview



## [Traceability 4.0 Video](#)





thank  
you

Eric Henefield

Global Director – Traceability Solutions  
Business

[eric.henefield@omron.com](mailto:eric.henefield@omron.com)

+1-651-279-3736





thank  
you

John Agapakis

Director, Traceability Product Management Group

[john.agapakis@omron.com](mailto:john.agapakis@omron.com)

+1.508.314.4143







thank  
you

Jason Mack

Advanced Sensing Sales Manager

[Jason.Mack@omron.com](mailto:Jason.Mack@omron.com)

+1 425-757-1357





thank  
you

Jake Marler

Solution Application Engineering Supervisor –  
Advanced Sensing

[jake.marler@omron.com](mailto:jake.marler@omron.com)

+1 606.369.1871

