

March 18, 2021

IIoT World's Manufacturing Day

The largest Industrial IoT virtual event in the world



Send your questions using:
#IIoTWorldDay #IIoTWorldDays

New business models enabled by IIoT & AI

10:30 AM – 11:30 AM ET



Sid Verma
Hitachi Vantara



Bob Hynes
JR Automation



Johnaton Vest
Hitachi Vantara



Anand Gnanamoorthy
Frost & Sullivan



Geof Wheelwright
IIoT World

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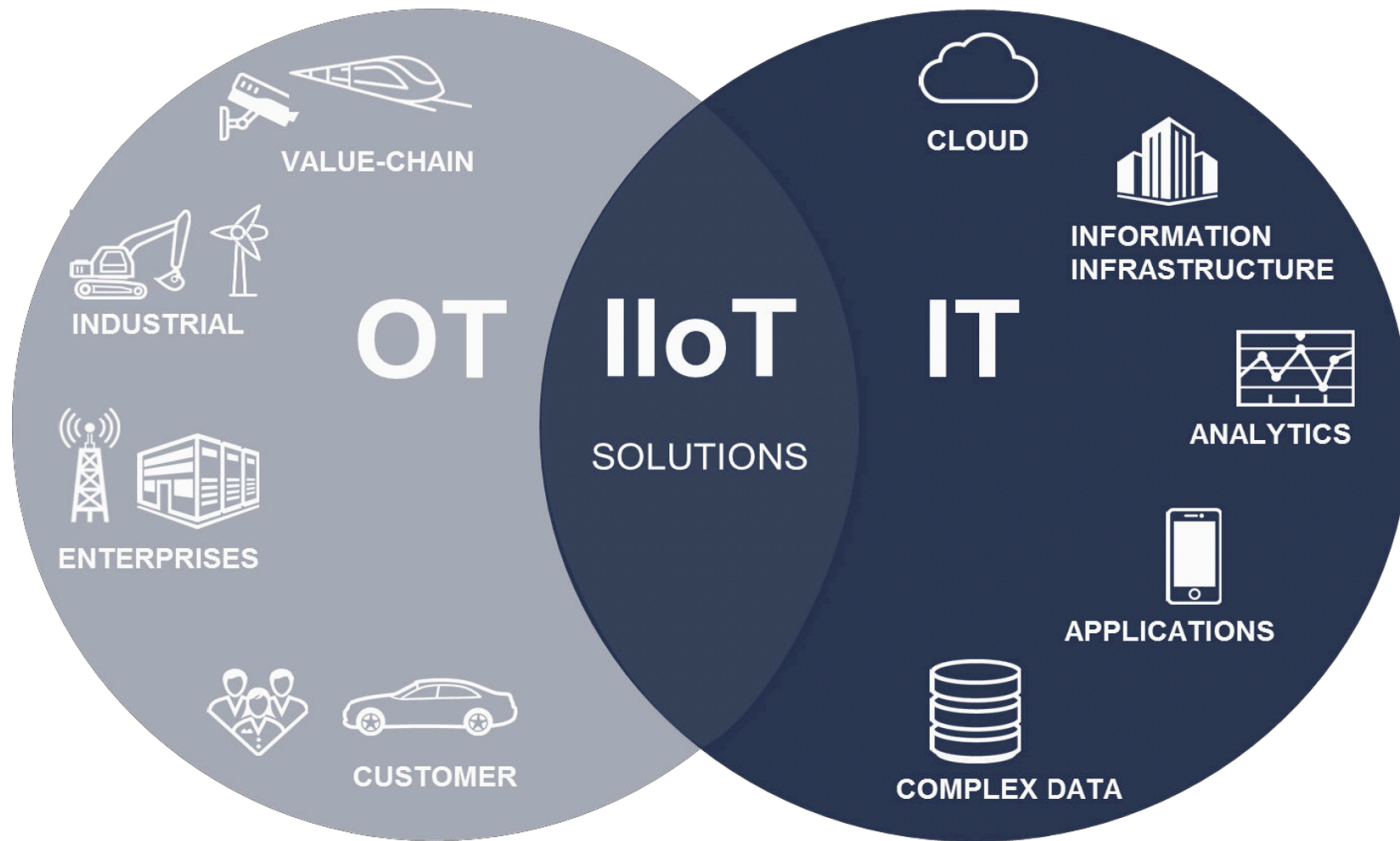
10:30 AM – 11:30 AM ET



Anand Gnanamoorthy

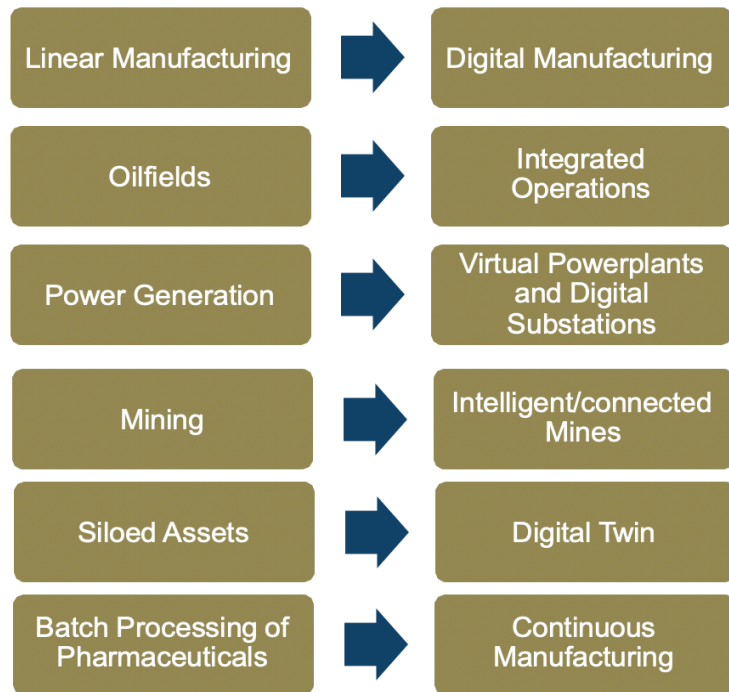
Frost &
Sullivan

Convergence: IT/OT – New Growth Markets and New Monetization Opportunities



Tectonic Shifts Affecting Industries and Markets for Next Decade

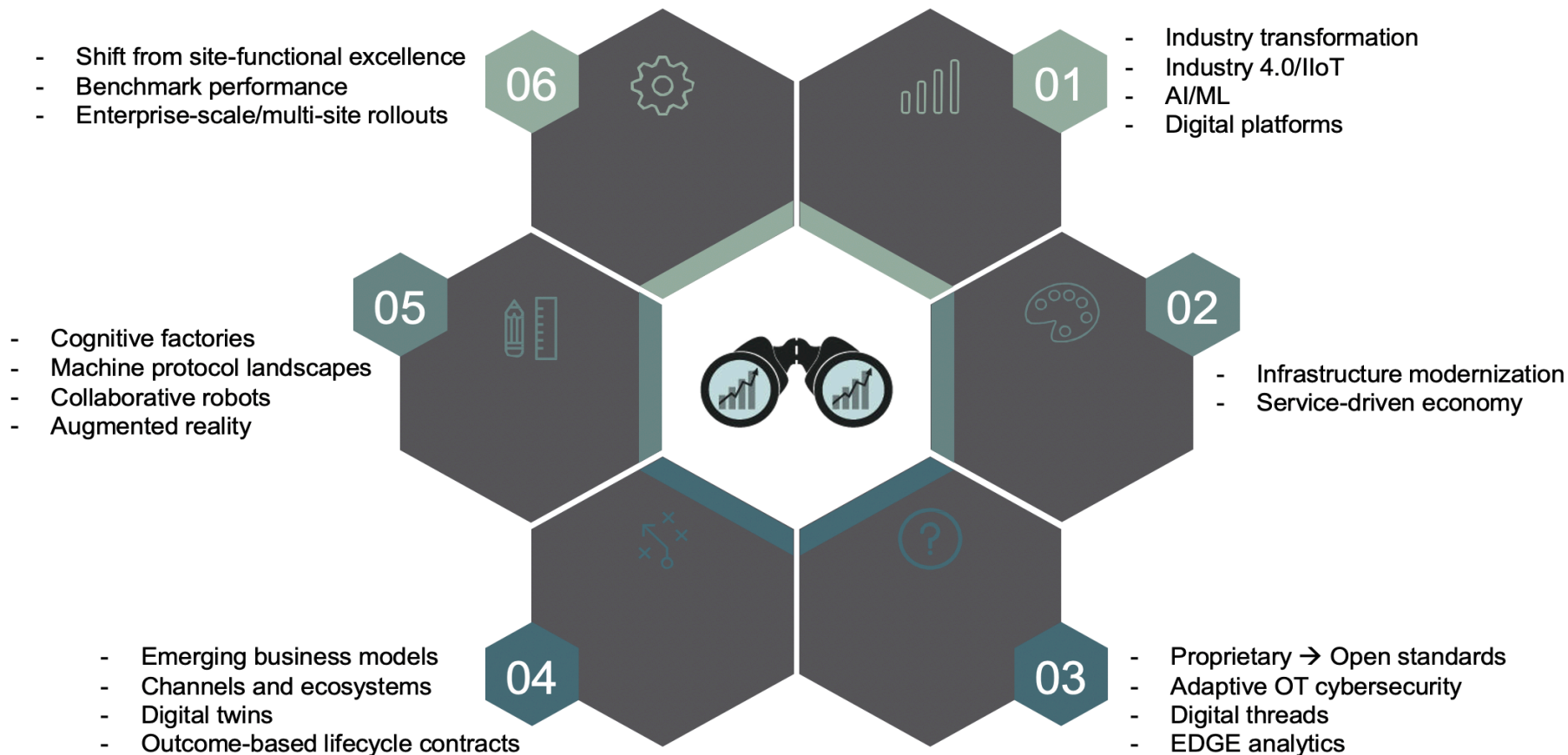
INDUSTRIES



MARKETS



Market Trends: Transformative Forces Over the Next 10 Years




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Sid Verma

Hitachi Vantara

NEW BUSINESS MODELS ENABLED BY IIOT & AI

IIOT WORLD

Sid Verma

General Manager, Manufacturing Practice,
Hitachi Vantara, San Francisco, CA



Manufacturing Industry and the New Normal?

The rate of change in external factors that impact a manufacturing business has increased over the past decade and is accelerating



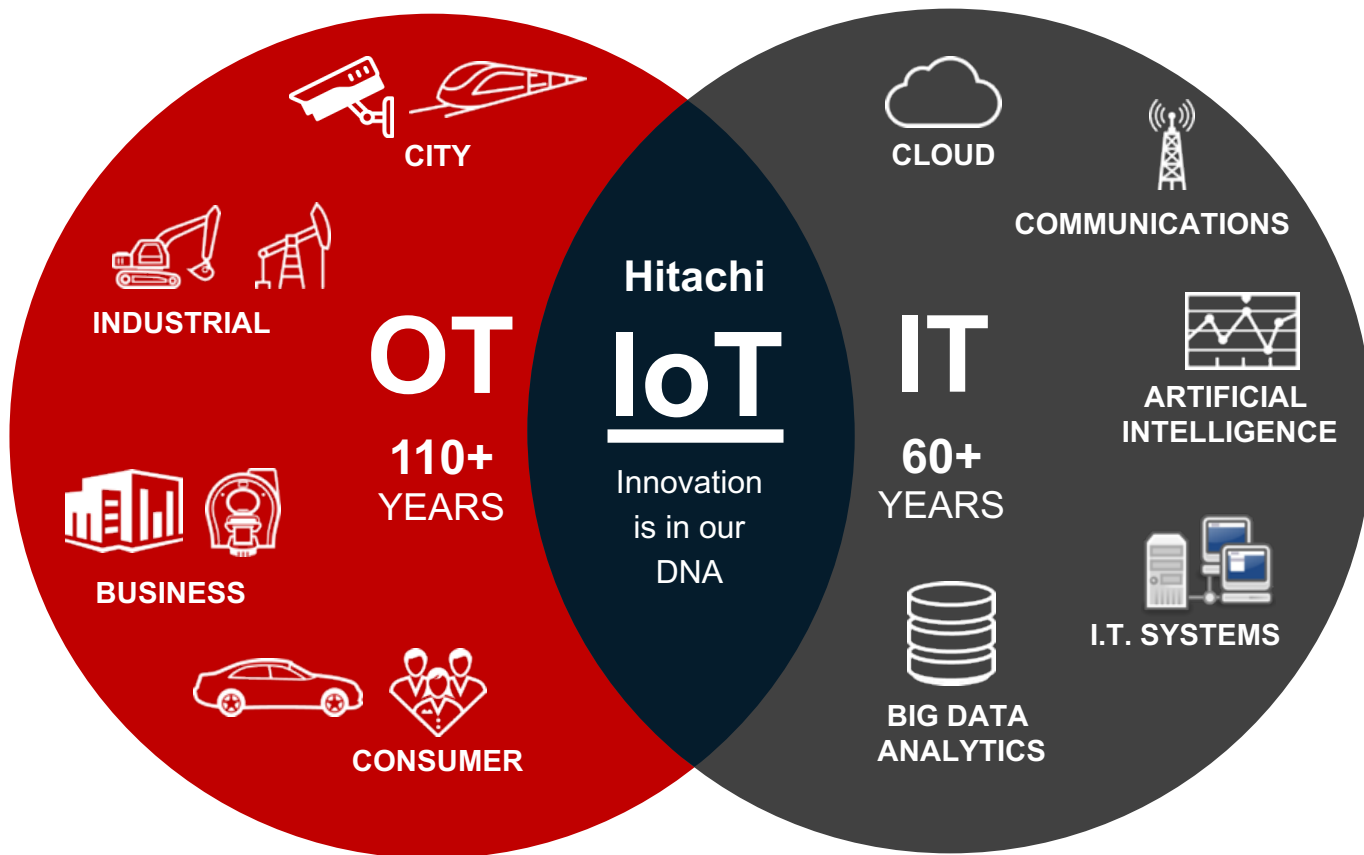
Reviving the global economy requires the revival of the manufacturing sector.

Bloomberg

Manufacturing contributes more than **15%** of GDP in many of the world's developed economies. (China - 27%, the US - 11%, Japan - 19%, Germany 23%, S. Korea - 29%, India - 16%)

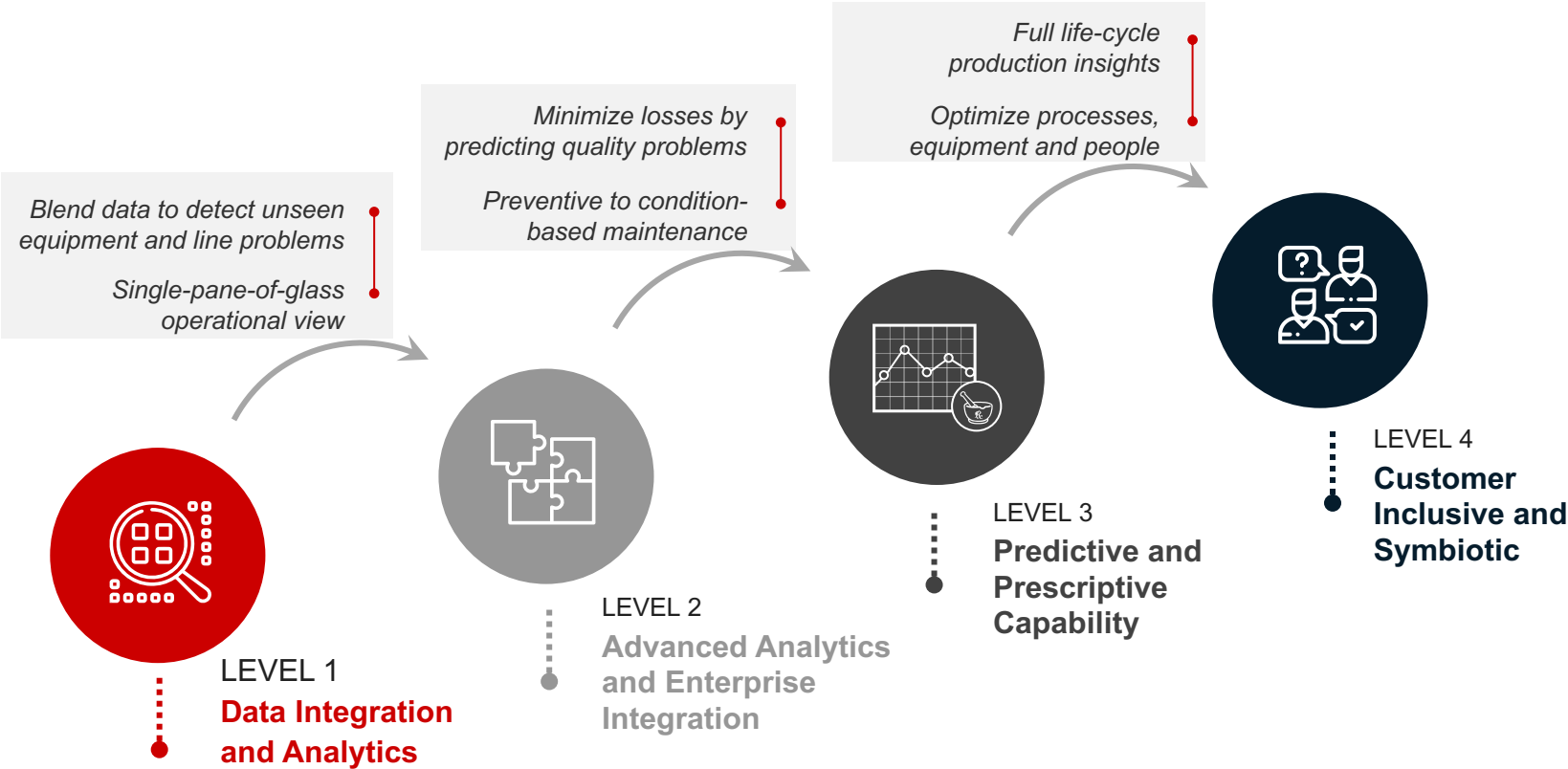
Some Background on Hitachi Vantara

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Intelligent Manufacturing Journey

Intelligent Manufacturing Maturity Model



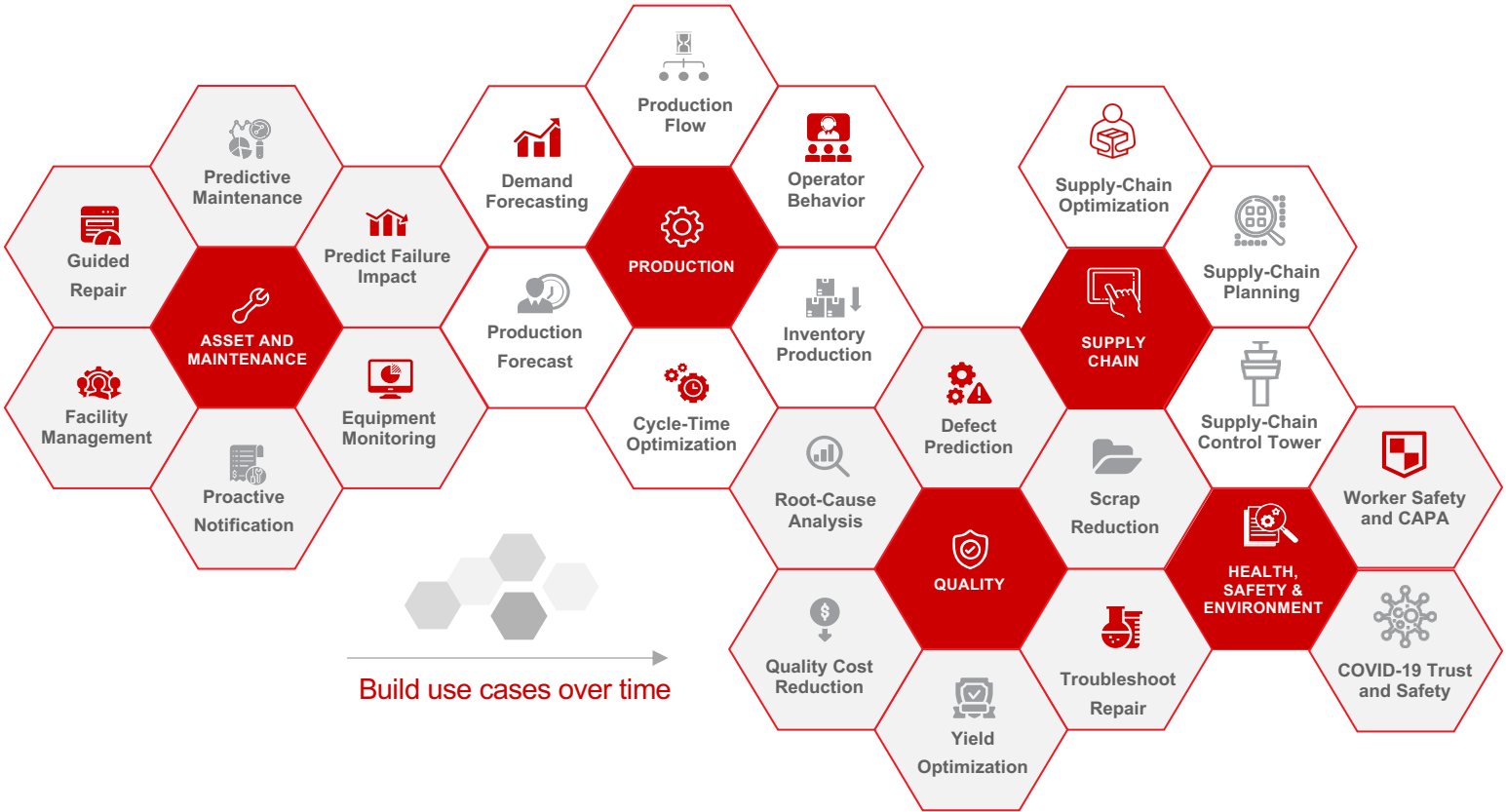
Mapping A Solution Approach

In Concert with Your Intelligent Manufacturing Journey



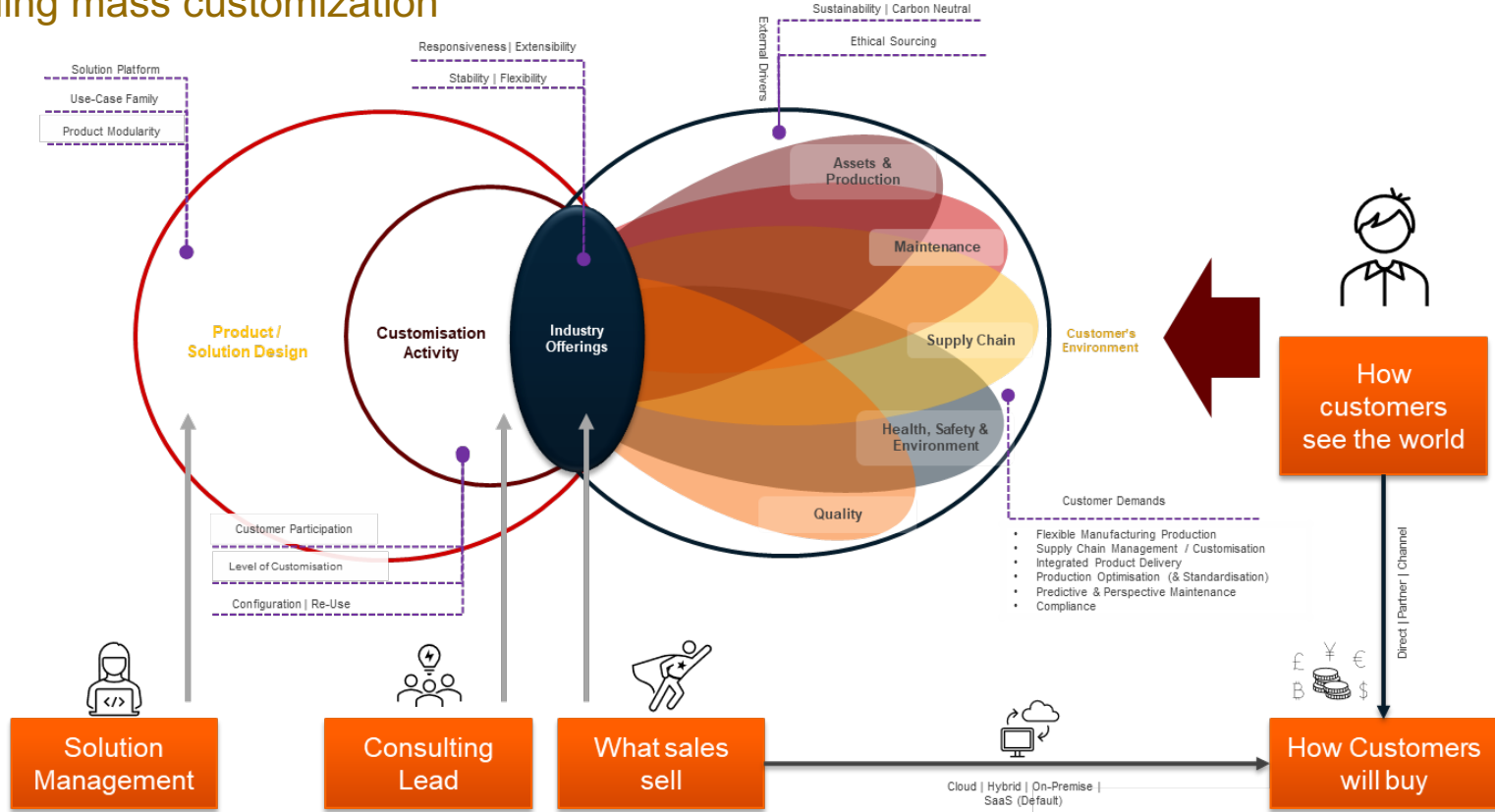
Building Blocks for Digital Industrial Transformation

Use Cases for the “Run-Transform” Cycle



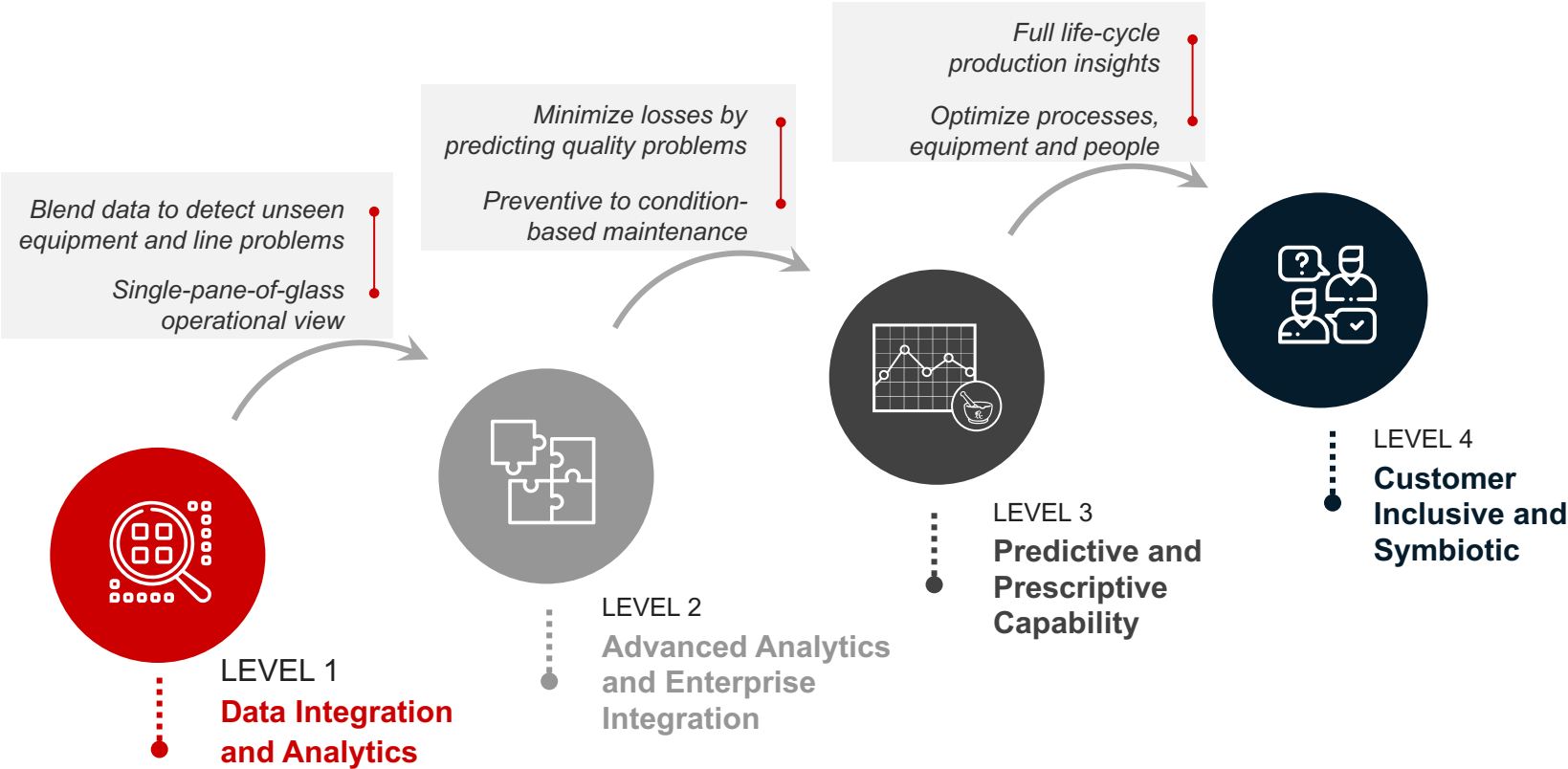
Closing the gap and creating a path to scale

Enabling mass customization

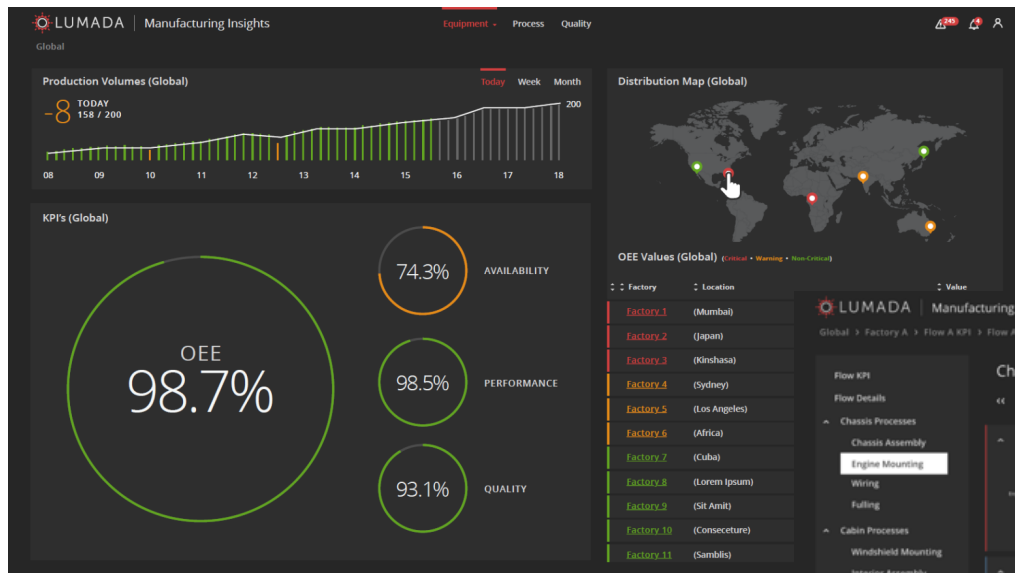


Intelligent Manufacturing Journey

Intelligent Manufacturing Maturity Model

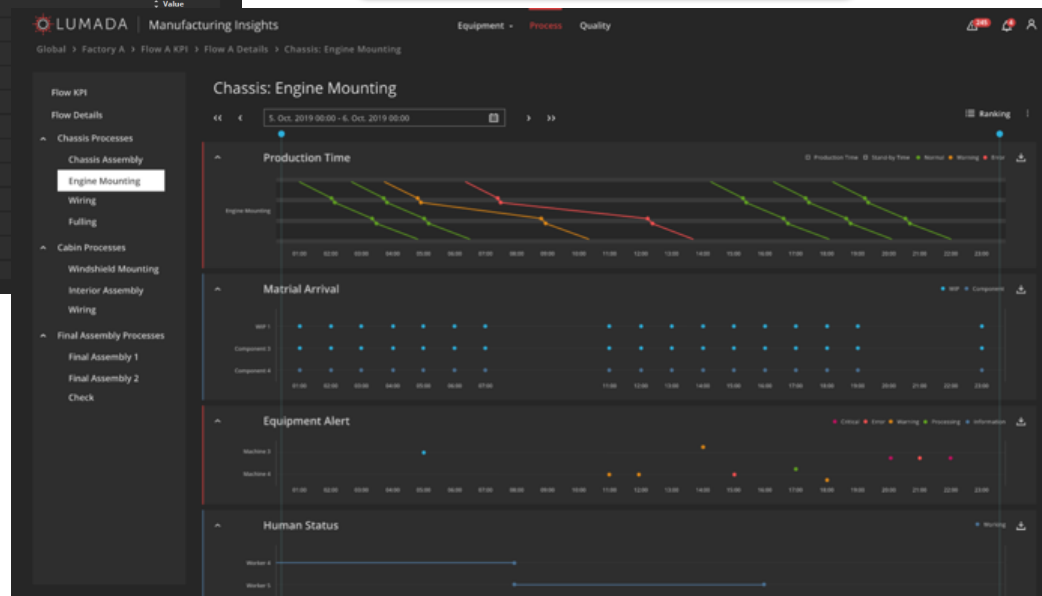


Persona Dashboard View Example 1

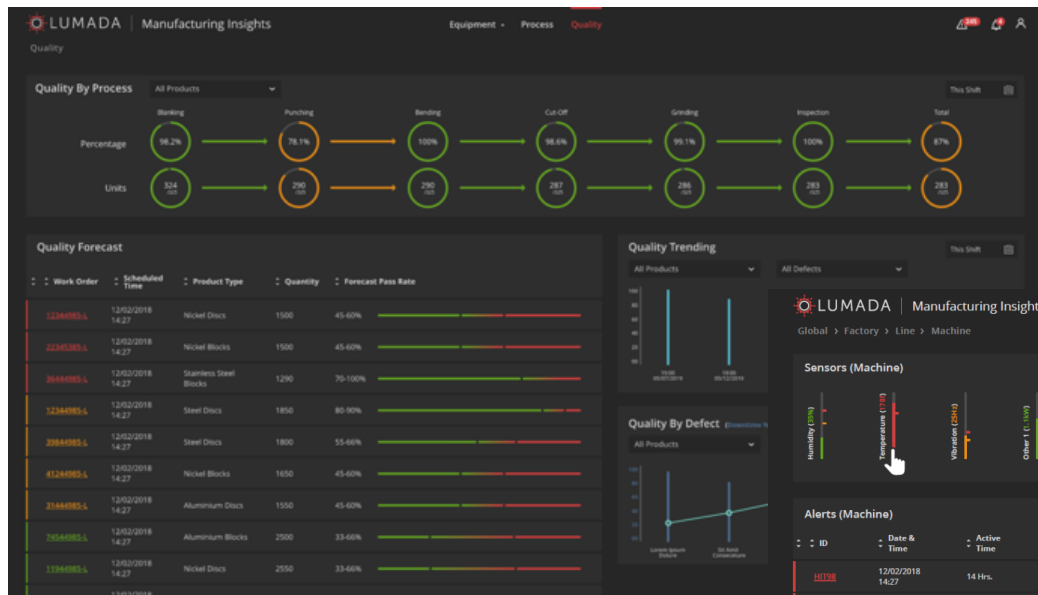


Global View
Company Manager

Production Manager
Line View



Persona Dashboard View Example 2

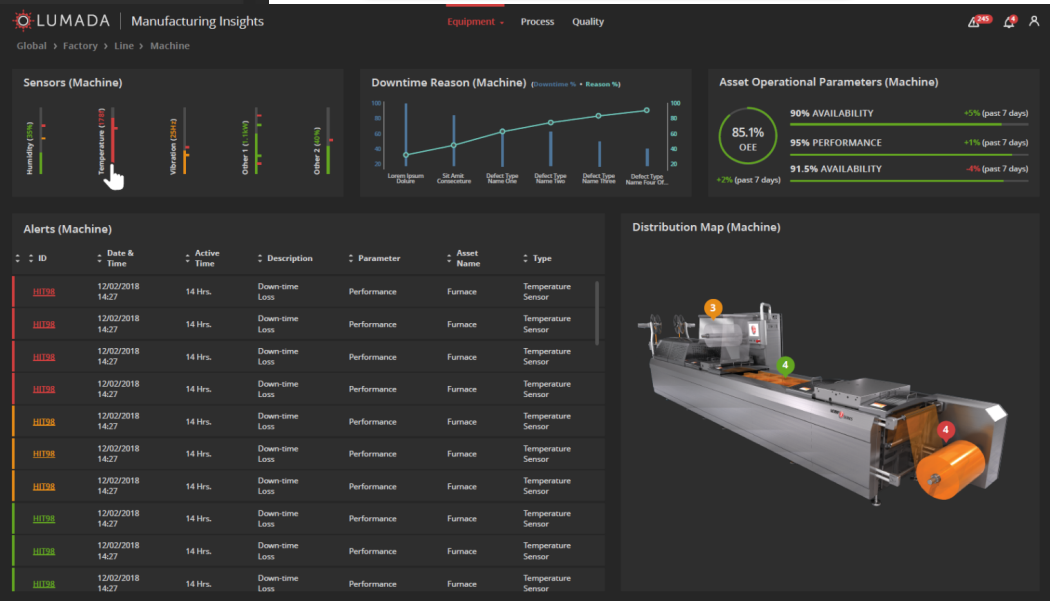


Maintenance Tech

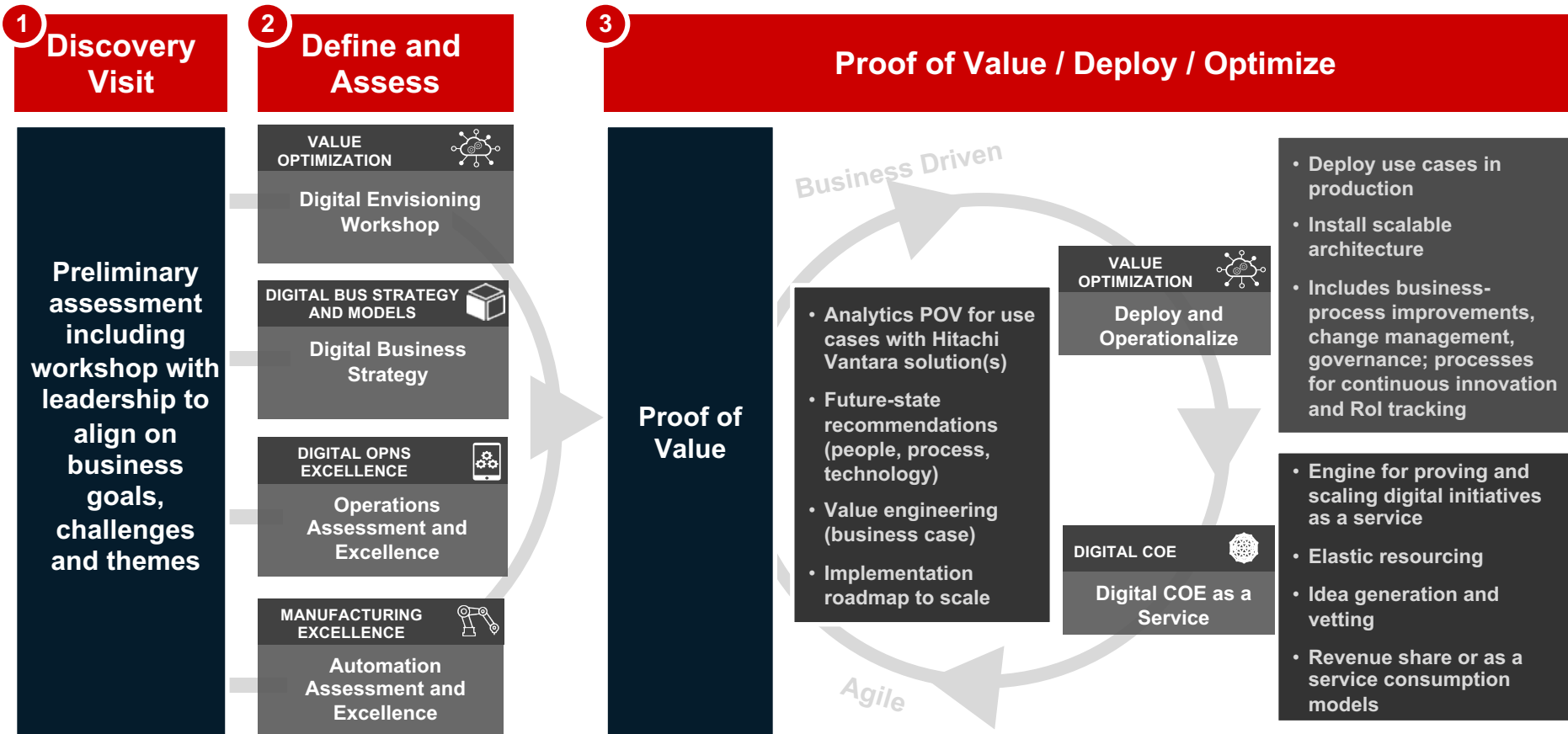
Analytics View

Quality View

Quality Manager



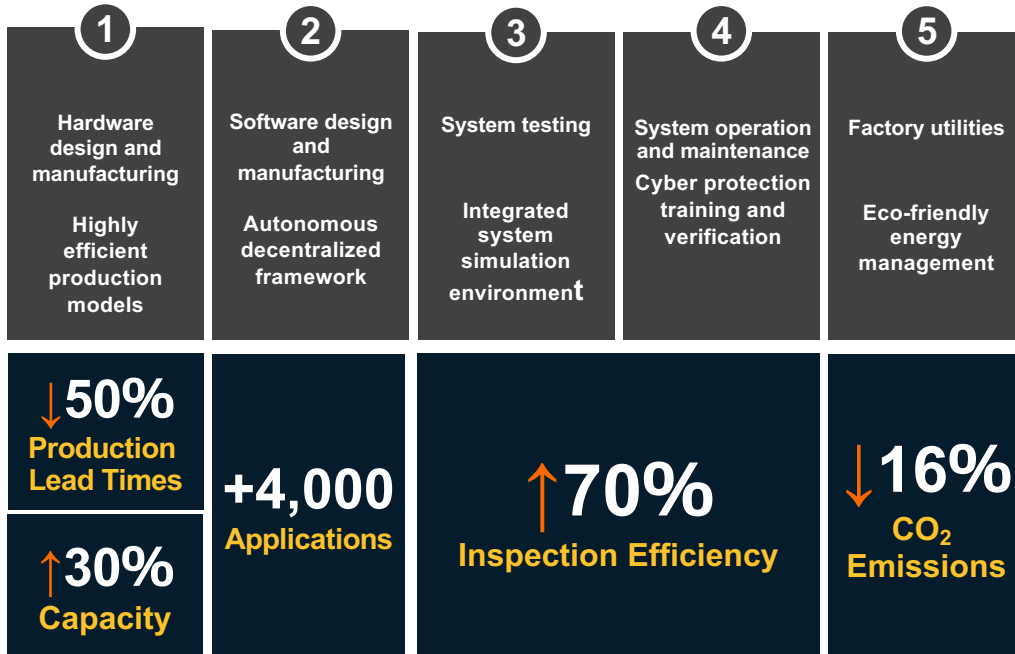
Approach to Accelerate Vision-to-Value



Hitachi Internal Digital Transformation

The Global Lighthouse Network

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Hitachi's Omika Works Recognized as an "Advanced 4th Industrial Revolution Lighthouse" by the World Economic Forum



Customer Case Study Accelerating Industrial 4.0 Transformation

Customer snapshot

- A global supplier of commercial and industrial vehicle systems
- Over 30 manufacturing, applications and customer service locations
- Serving asset intensive industries; transport, construction equipment, defense, agriculture



Challenges

- Downtime
- Performance issues
- Lack of real-time OEE data
- Manual route-based condition monitoring

Customer Roadmap & Approach

Lumada Manufacturing Insights Portfolio

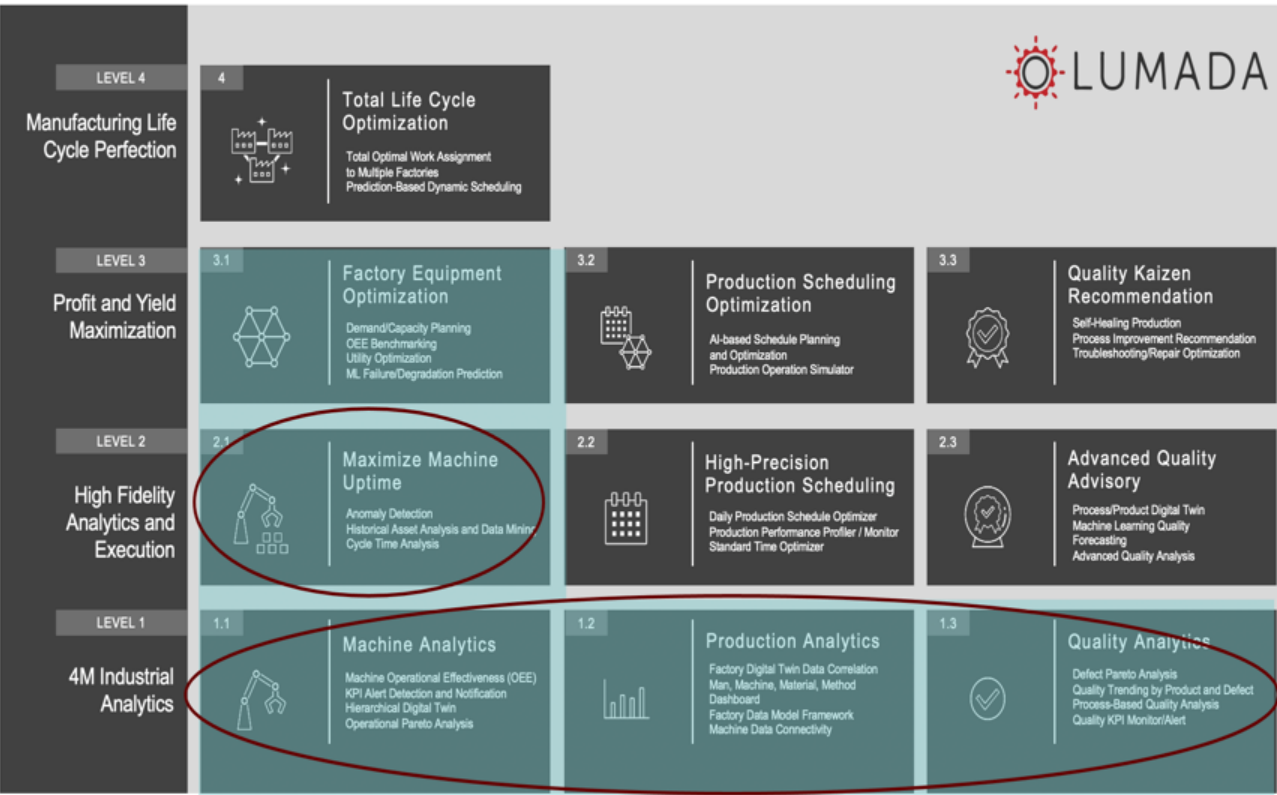


Customer Inclusive and Symbiotic

Predictive and Prescriptive Capability

Advanced Analytics and Enterprise Integration

Data Integration and Analytics



Key Outputs

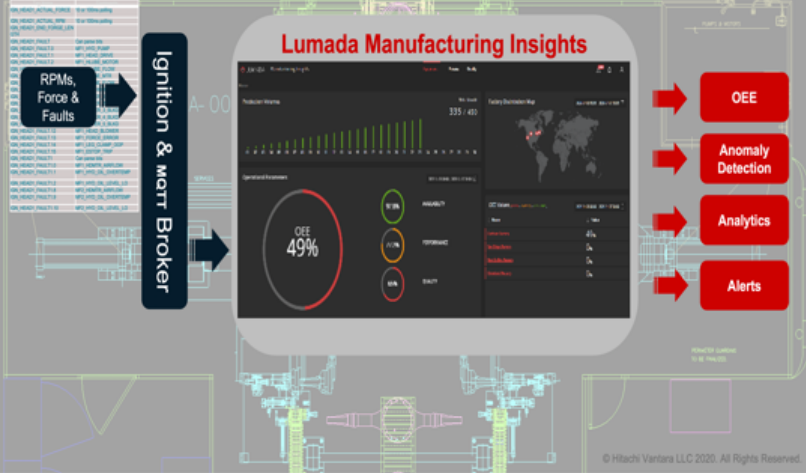
LEVEL 1

Real-time OEE

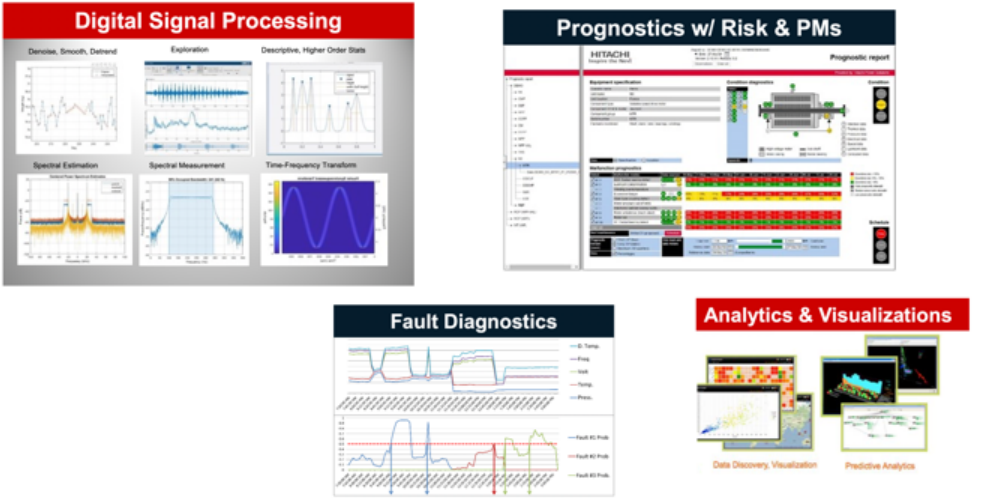
LEVEL 2

Machine Conditioning Monitoring

OEE Driven Productivity Gains

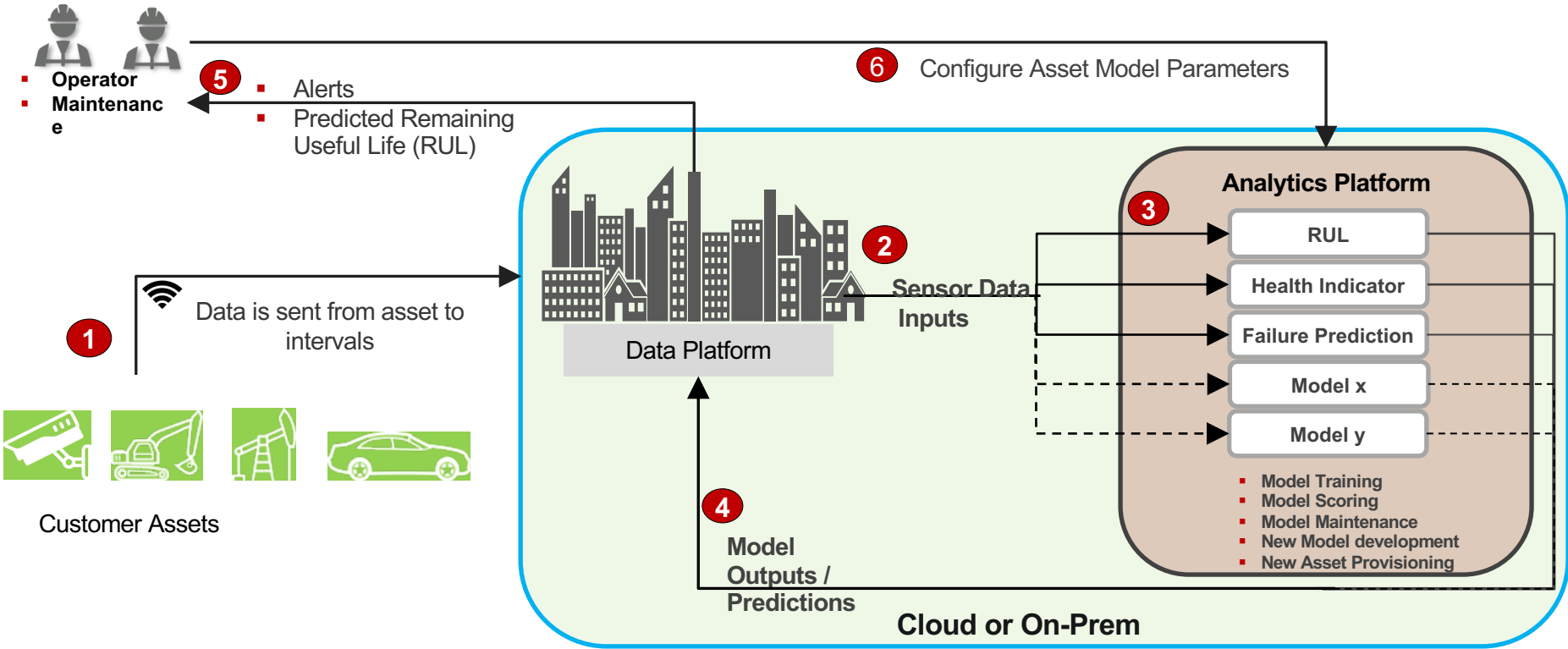


Advanced Predictive - DSP



Continuous Improvement Approach: DSaaS Solution

This diagram outlines how our solution works:



LEVEL 2: Machine Conditioning Monitoring

MVP Design

- Online conditioning monitoring architecture: I/O modules, programmable gate arrays, real time processing, analysis software
- Control room/ dashboard with real time machine conditions and alerts Engineering/Maintenance personnel of potential future failures and/or current faults
- Workflow visibility for verification after investigation, maintenance pm planning, spare parts ordered and implementation at next maintenance interval
- History of production and uptime performance stored for root cause problem solving

Data requirements

- Machine parameter data from Fab machines to generate condition dashboard
 - Data in addition to what is currently tracked may need to be collected such as vibration, speed, position, pressure, temperature, flow, etc.
 - Real time data processing needed

Technical requirements

IIoT platform with OPC UA native integration capability

Specific Data Acq software (FFT, Time Domain, etc.), Hardware infrastructure (cabling, ethernet switches, server, etc)

Native user-friendly UI for building dashboard

CMMS front end for workflow mgt

- OEE :25% reduction in machine breakdown
- 2-3 point increase in OEE due to machine availability
- Labor: 25% reduction in machine downtime

- OEE 25% minor stops reduction

Impact

Accelerated Intelligent Industry 4.0

Business
Problem
Addressed

- Real-time KPI visibility
- Reduced downtime/failures
- Real-time mobile monitoring and predictive failure modes

- Real-time OEE drill down
- Increased visibility from through the line monitoring

MVP Design

- Vorne system and scanners on all machines
- A developed architecture to support online condition monitoring including I/O modules, programmable gate arrays, real time processing, analysis software
- A control room type dashboard that displays real time machine conditions and alerts Engineering/Maintenance personnel of potential future failures and/or current faults

Data requirements

- Part cycle times
- Downtime reason codes

Technical requirements

- IIoT platform with OPC UA native integration capability
- Current Vorne System initially
- Digital transformation solutions provider in near term future

LEVEL 1: Real-time OEE

Fast Track SMB Industrial Digitalization Journey

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**Defined
roadmap**



**Turnkey
solution**



**Packaged
industrial IP**



**Long-term
partnership**

Accelerated Intelligent Manufacturing Digitalization

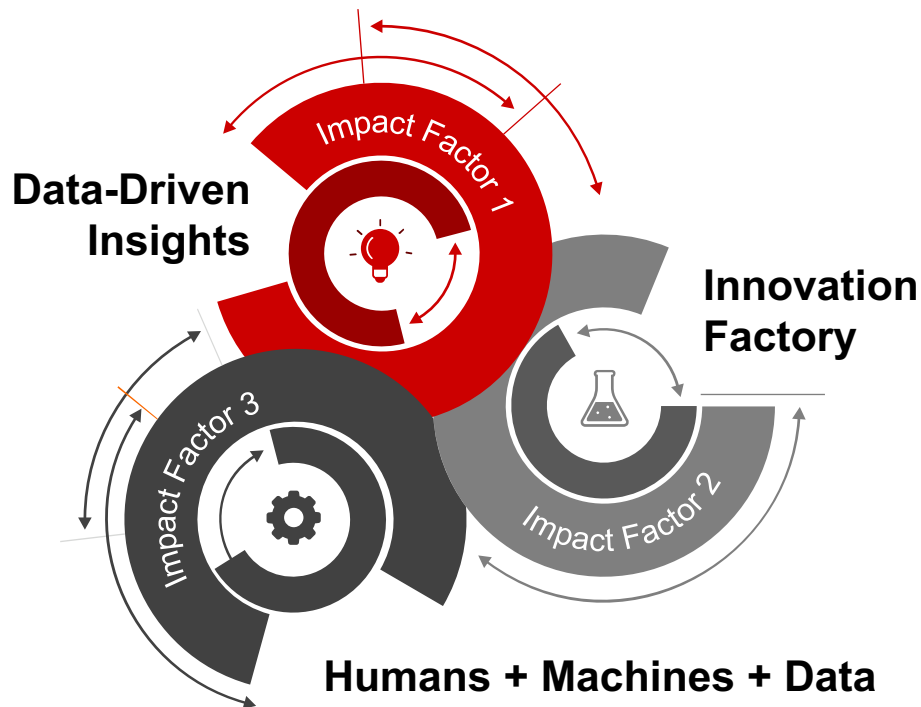
Key Takeaways and Next Steps

Jumpstart Your Innovation Factory

What are transformative outcomes that can accelerate operational innovation?

Drive Value Alignment

Orchestrate humans, machines and data to drive business value?



We have done it before- What can we do Together?

Thank You

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Hitachi Vantara

OT + IT = Perfect Partnership for IIOT

Bob Hynes
Director Digital Solutions

Johnaton Vest
Director Manufacturing Practice



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JR Automation Global Capability

(acquired by Hitachi in 2019)



23 LOCATIONS

USA, France, Romania, Singapore, China

1,200,000+ FT²

Of facilities worldwide

700+ MILLION DOLLARS

In annual sales, growth ahead of market

Collaboration, Experience, Custom Solutions, Reliability & Scale

40

Years of industry experience,
reliable since our 1980 founding

2900+

Employees globally providing
capital equipment and services

700+

Engineers committed to
developing innovative solutions

EXPERIENCE

Industries



Aerospace & Defense



Construction



Food & Beverage



Amusement



Consumer Products



Heavy Equipment



Automotive



E-Commerce & Packaging



Life Sciences



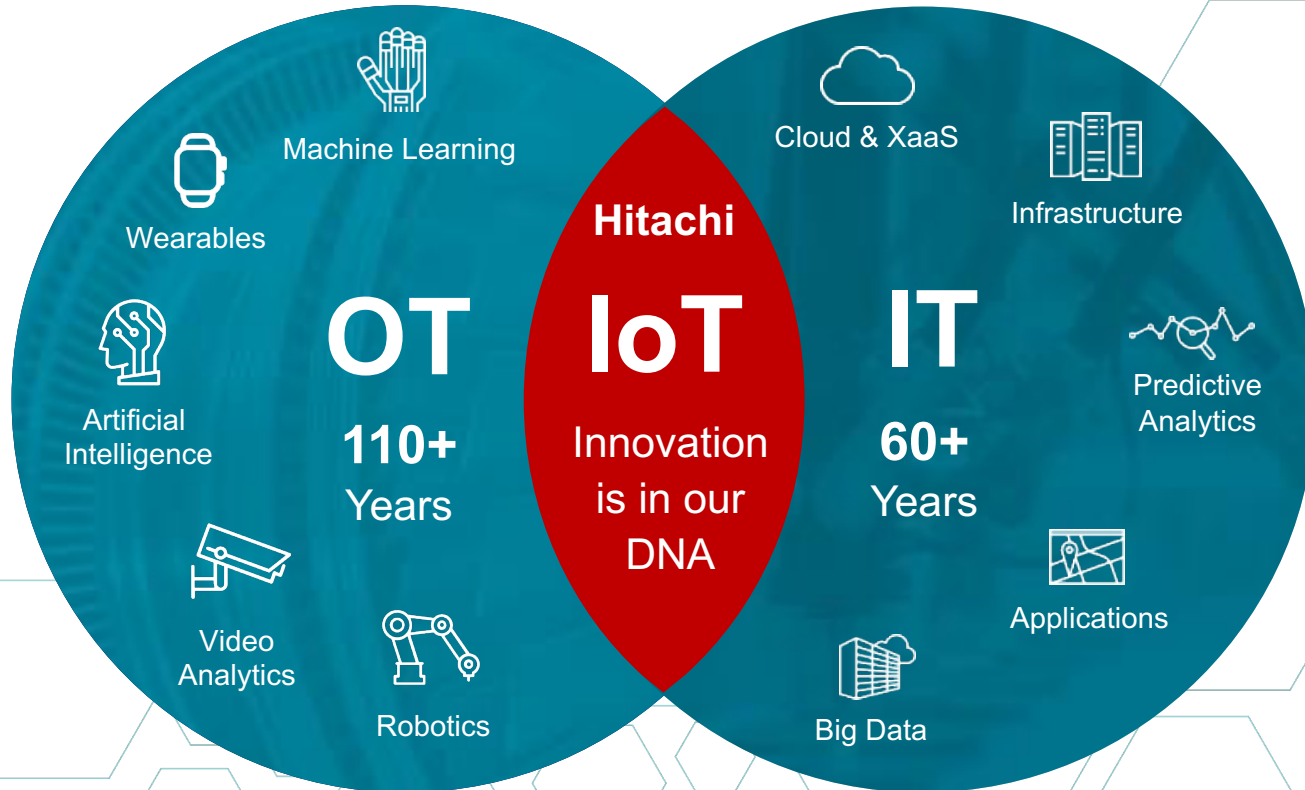
Battery & Energy



Fibers

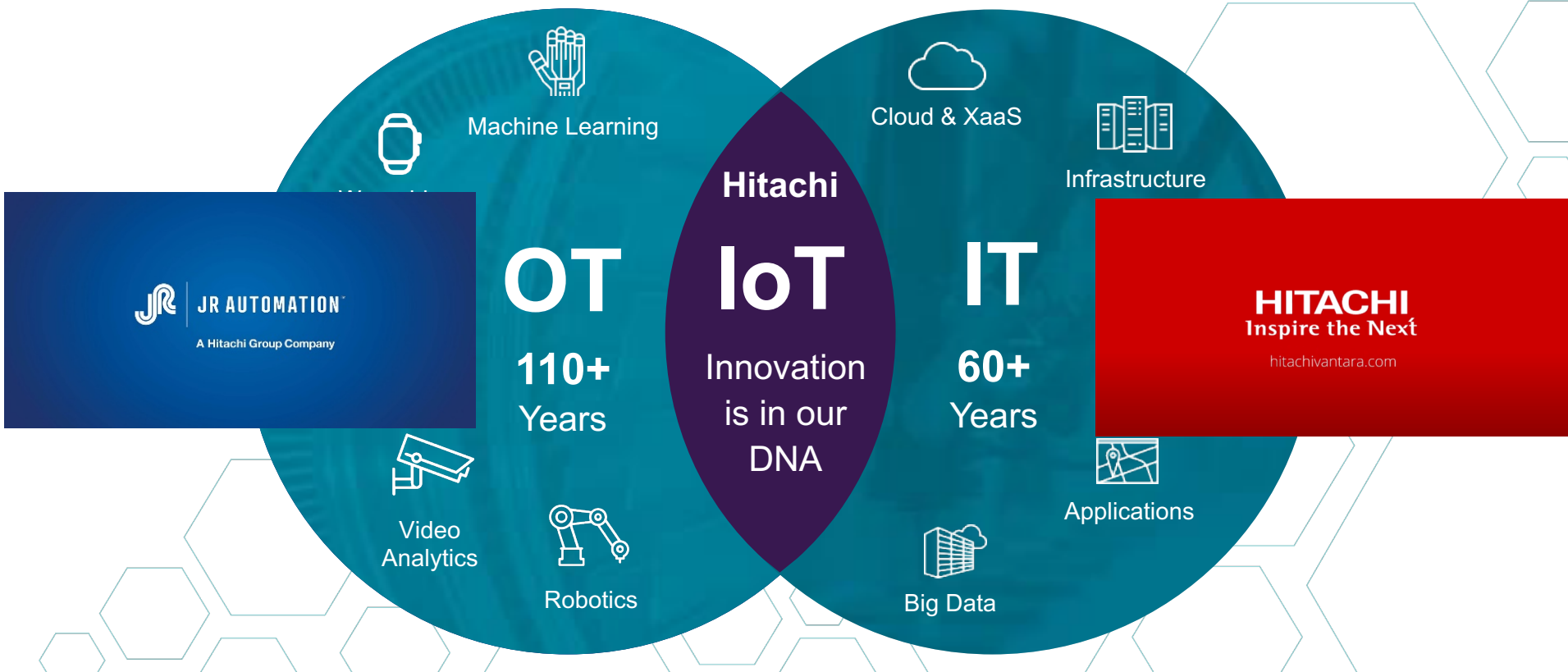
Hitachi provides a powerful combination of **Operational Technology (OT)** and **Information Technology (IT)** expertise

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Hitachi provides a powerful combination of **Operational Technology (OT)** and **Information Technology (IT)** expertise

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SmartAttach™

Automated Nutplate Installation System

(Patent pending)

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Unprecedented Speed, Accuracy and Manufacturing Intelligence

This technology completely changes the game for nutplate attachment. The SmartAttach™ Aircraft Nutplate Installation System integrates centering, drilling, lubrication, countersinking and riveting operations in a single machine. You can cut nutplate attachment times by at least 60%. You'll greatly improve precision and repeatability for rivet and center holes. It also brings you IoT capabilities for intelligent monitoring and process management.



Think. Solve. Create.

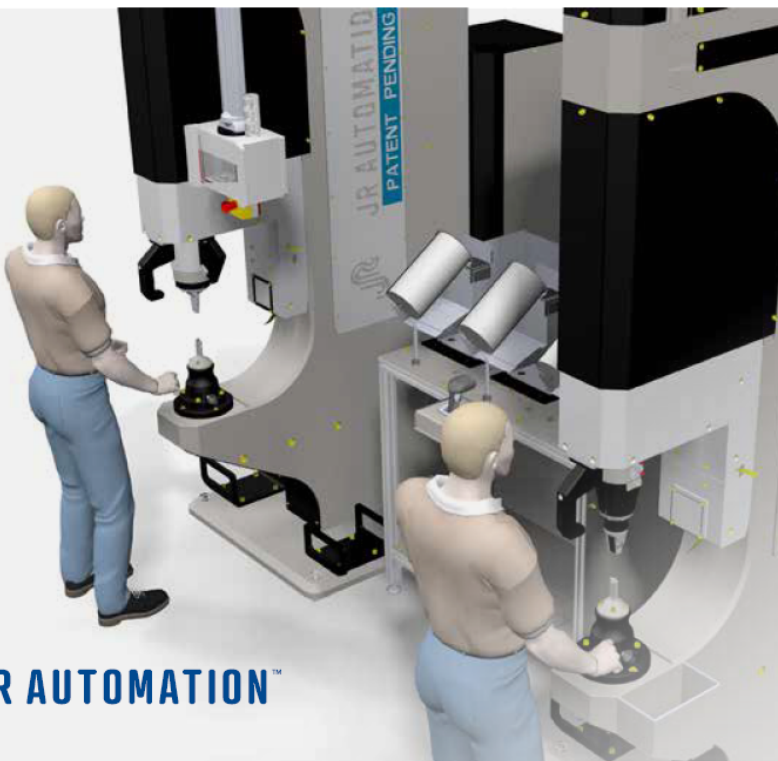
A Hitachi Group Company

SmartAttach™

Automated Nutplate Installation System

(Patent pending)

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Full Industrial IoT Capabilities

The SmartAttach Automated Nutplate Installation System is fully integrated with Lumada Manufacturing Insights, Hitachi's AI-enabled and data-driven IoT solution that allows manufacturers to optimize machine, production and quality outcomes.

Comprehensive and actionable insight is provided across a range of functions, including:

- Process Information: Cycle Time and Part-to-Part Time
- Machine Health and Key Performance Indicators
- Anomaly Detection and Predictive Maintenance

The Lumada Manufacturing Insights solution is modular and allows for expansion and connections with SCADA and MES systems for additional scale and functionality.

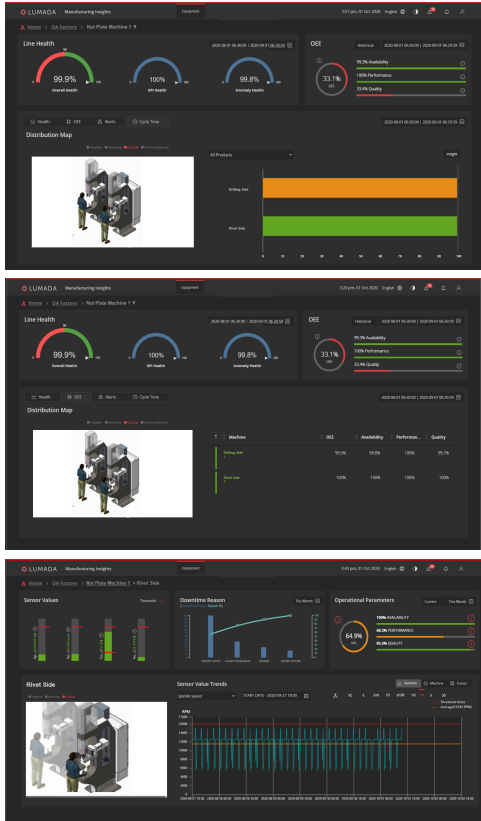
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Lumada Manufacturing Insights for JRA

Machine



Dashboards



Outcomes

Visualize real time and historical sensor data and KPI's and provide threshold notifications and alarms

Machine scheduling and utilization percentages.

Detect anomalous behavior in both sides of the machine (drill and rivet)

Calculate and visualize Manufacturing Process Time (Cycle Time & Part to Part Time)

Provide single view of Asset Analytics using data mining for visualization of subsystems, components and sensors