
VIBRA
CONFIABILIDAD • ESTRATEGIA • VALOR

Corporativo Vibra

VIBRANALYSIS, INC.

Fundada en 1995 cómo VibrAnalysis Inc.

Proveedor de Soluciones dedicado a entregar resultados y valor agregado en las operaciones de Mantenimiento en los sectores de industria farmacéutica y de generación de electricidad en Puerto Rico:

Servicios de Mantenimiento Predictivo y Servicios de Mantenimiento de Precisión

VibrAnalysis, Inc.

Se desarrolla hasta convertirse en el **líder de las iniciativas de Confiabilidad Industrial**.

Continua incrementando su portafolio ofreciendo servicios educacionales de las mejores herramientas de confiabilidad y equipos de mantenimiento de precisión durante todo el año.

VibrAnalysis
Lean on Reliability

El mayor proveedor de Servicios de Confiabilidad en el Caribe atendiendo Latinoamérica.

Staff combinado de mas de 40 Profesionales del Mantenimiento y la Confiabilidad.

Con oficinas locales en **República Dominicana, México** y oficinas centrales **en Puerto Rico.**

VIBRA
CONFIABILIDAD • ESTRATEGIA • VALOR

Empresa enfocada en el desarrollo de estrategias de mantenimiento basado en confiabilidad con el objetivo de **maximizar el valor de los activos en las plantas industriales**.

Cultura empresarial dinámica y versátil. Mejoramiento continuo y enfoque en confiabilidad.

Nuestro Alcance

Oficinas en:

- Monterrey, México
- San Juan, Puerto Rico
- Santo Domingo, Republica Dominicana

Misión:

"**Transformar** la forma en que la industria realiza **mantenimiento** a través de la gestión de **condición de activos** y la **Ingeniería** de **Confiabilidad**".

Nuestros Clientes

- Confiabilidad no es un tema exclusivo a un mercado vertical.
- Cada mercado tiene un entorno operacional y económico especifico.
- Flexibilidad para definir estrategias ajustadas a la realidad de cada cliente es parte de nuestra formula.

Oferta de Productos y Servicios

Servicios Técnicos

- Programas de CBM
- Servicios de PdM
- Mantenimiento de Precisión

Consultoría

- Transformación de Estrategias de Mantenimiento
- Análisis de Oportunidades en la Salud de los Activos
- Mantenimiento Basado en Confiabilidad

Venta de Equipos

- Equipos de Mantenimiento de Precisión
- Herramientas de Confiabilidad
- Control de Contaminación de Lubricante

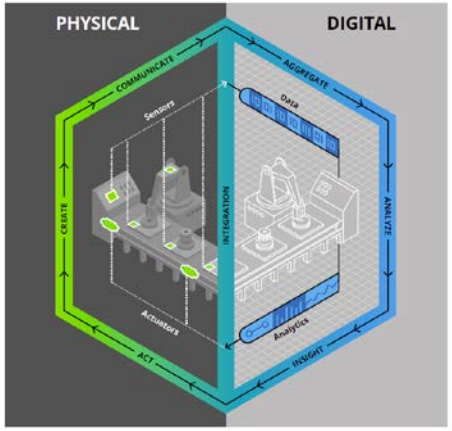
Educación

- Seminarios Públicos
- Seminarios en Planta

Manufacturing transformation journey

Felix Laboy, PE, CRL, CMRP

CMCM 2017



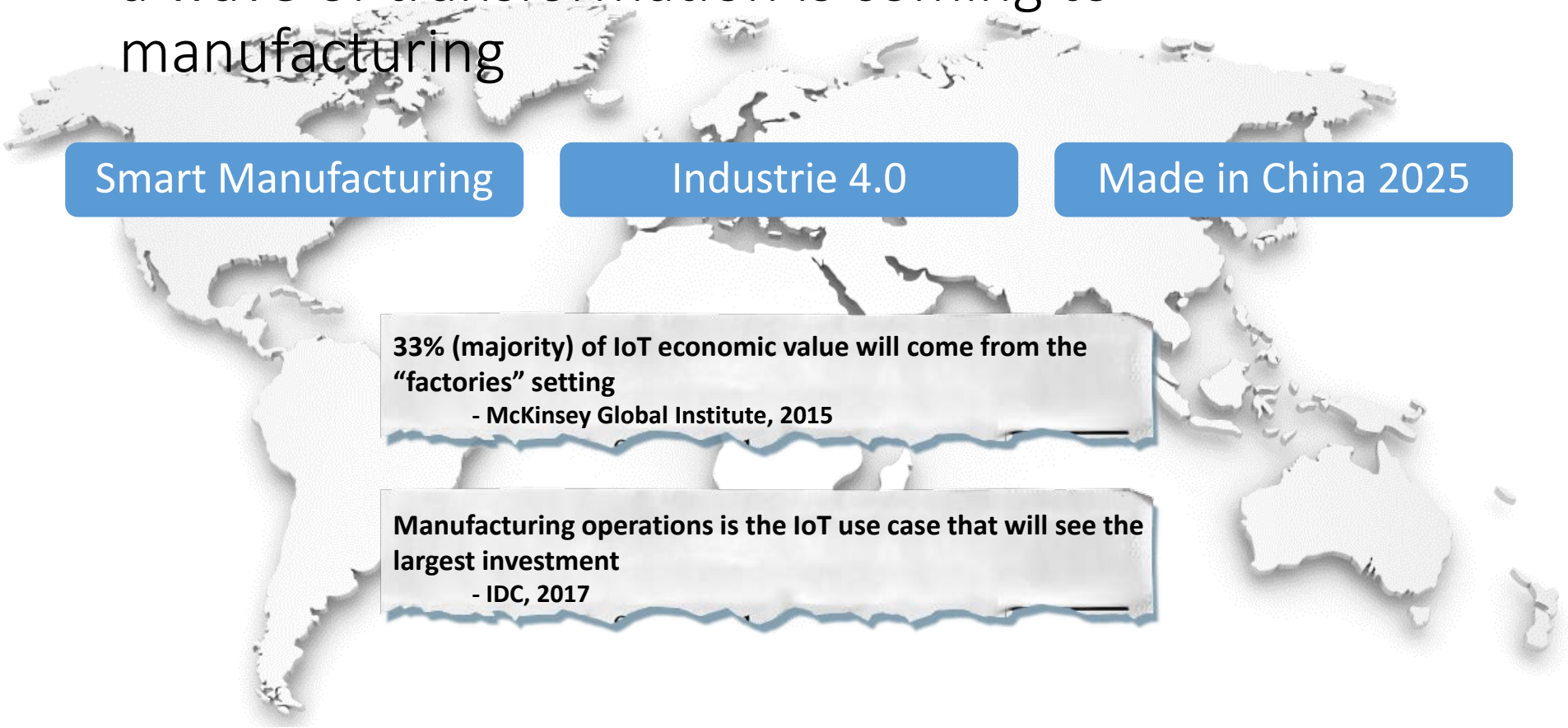
BRIDGE THE DIGITAL AND PHYSICAL WORLDS

DIGITAL WORLD

PHYSICAL WORLD

DIGITAL & PHYSICAL WORLDS
COMBINED

a wave of transformation is coming to manufacturing



Smart Manufacturing

Industrie 4.0

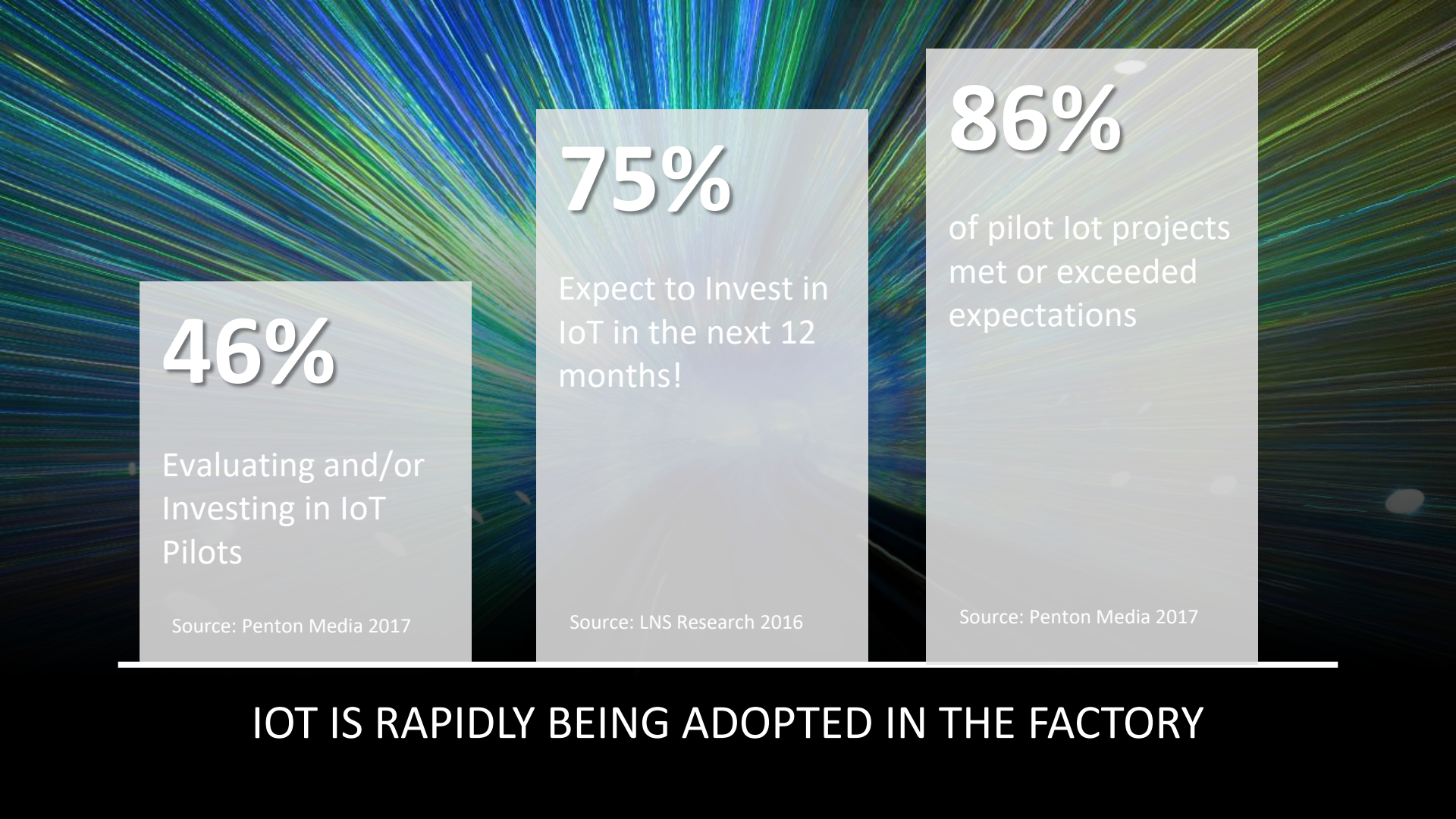
Made in China 2025

33% (majority) of IoT economic value will come from the "factories" setting

- McKinsey Global Institute, 2015

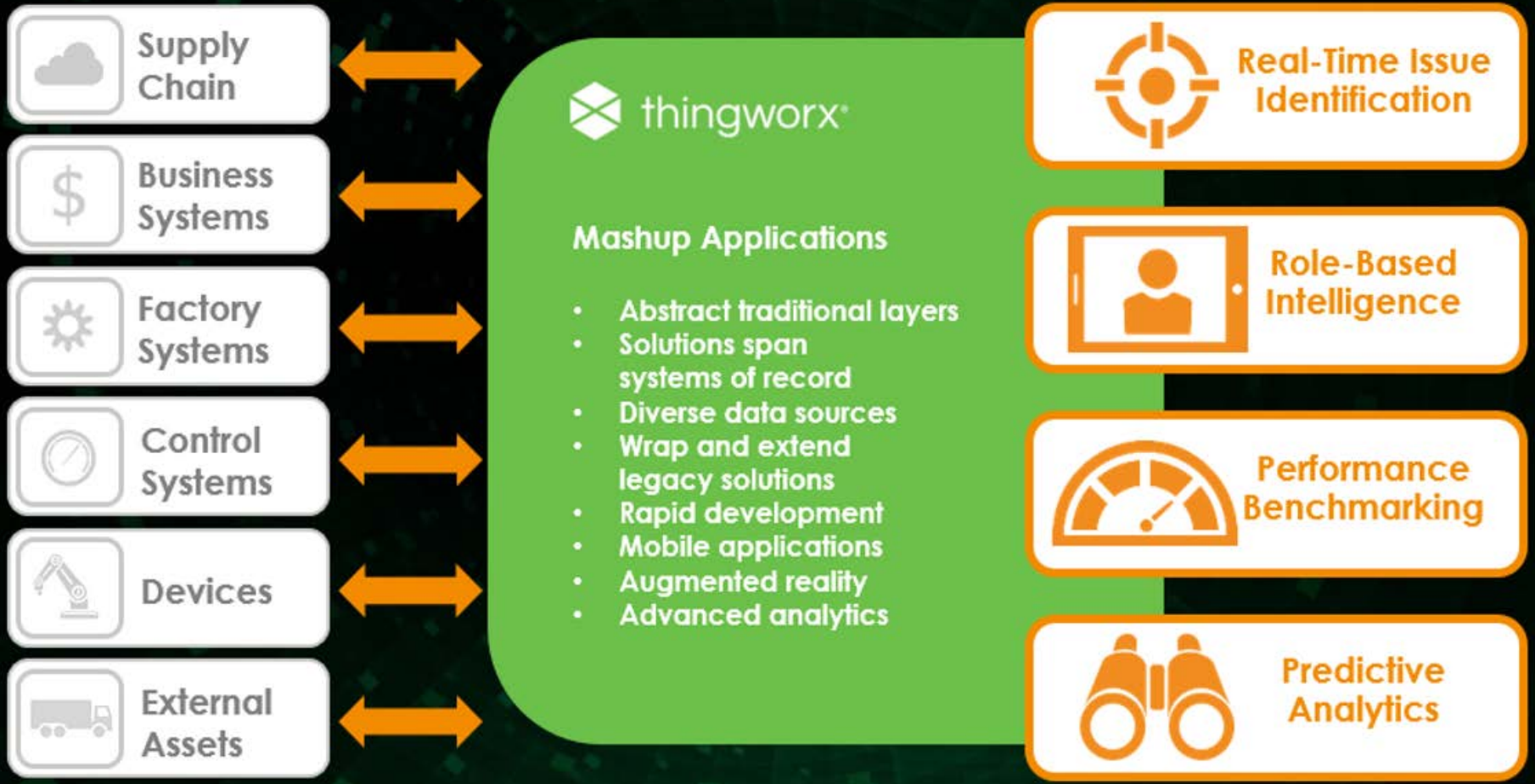
Manufacturing operations is the IoT use case that will see the largest investment

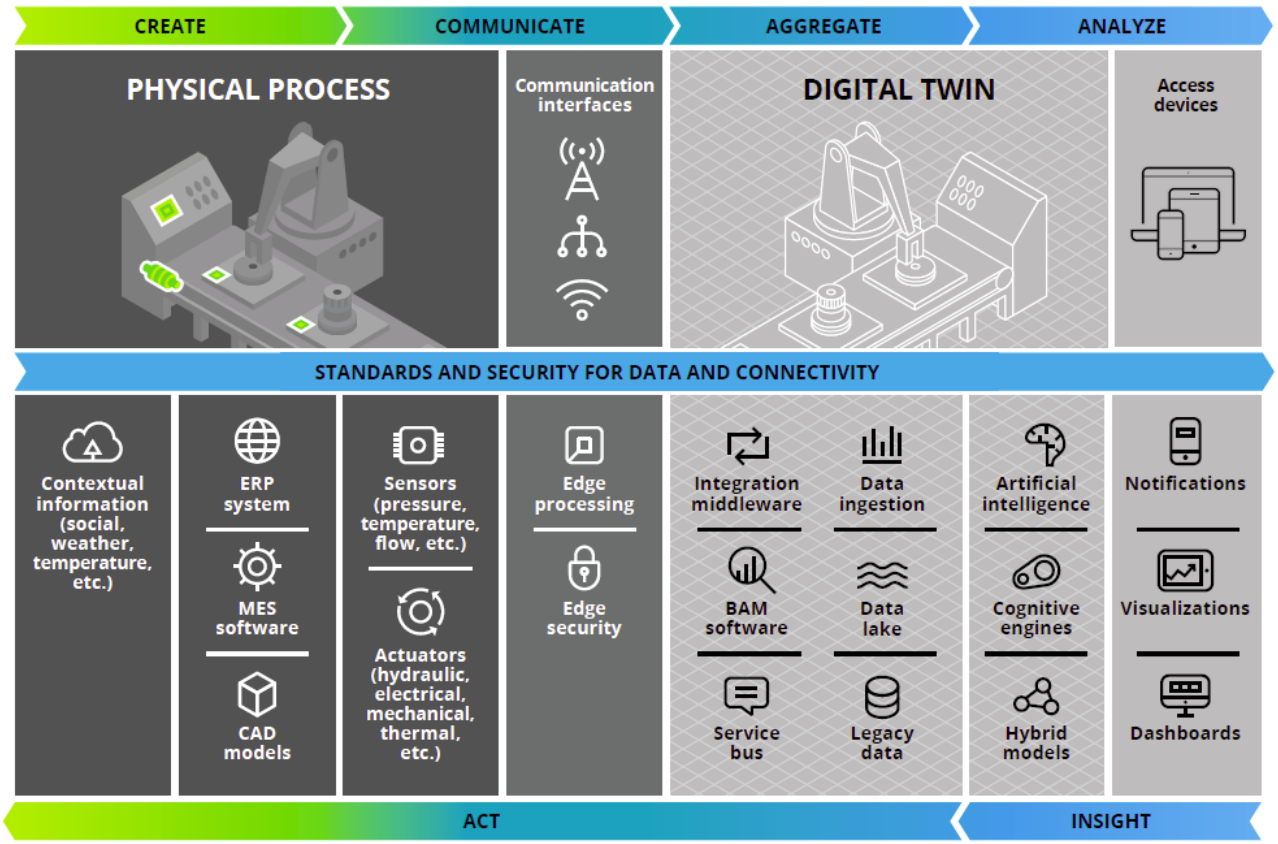
- IDC, 2017



IOT IS RAPIDLY BEING ADOPTED IN THE FACTORY

SOLUTIONS FOR DATA DRIVEN DECISION MAKING





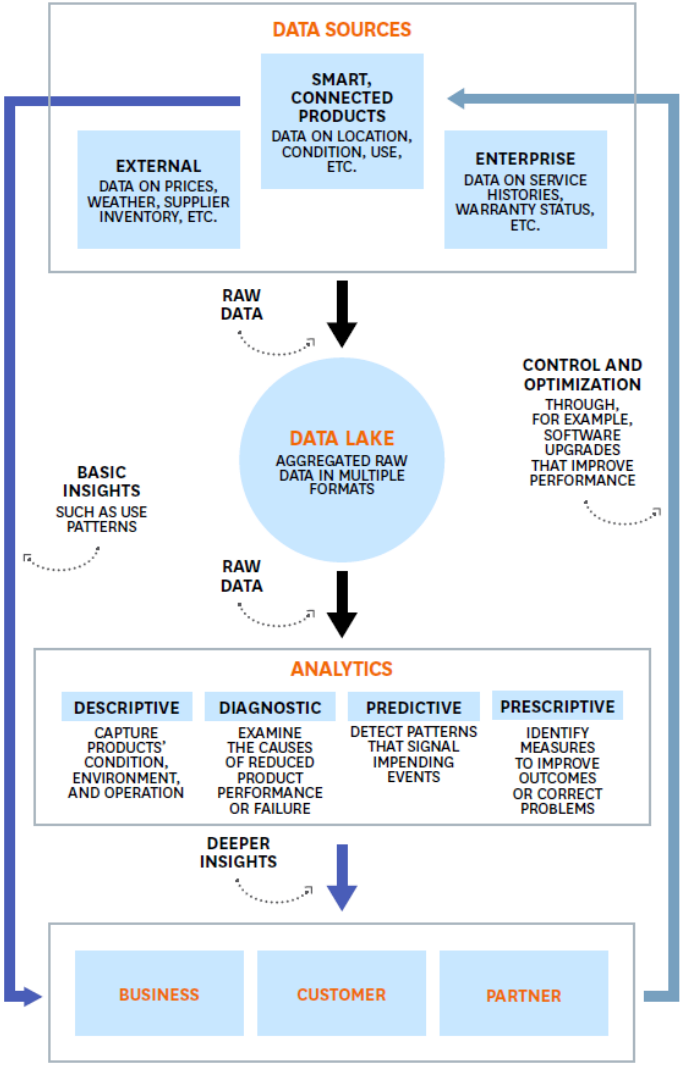
Source: Deloitte University Press.

Deloitte University Press | dupress.deloitte.com

Smart Manufacturing

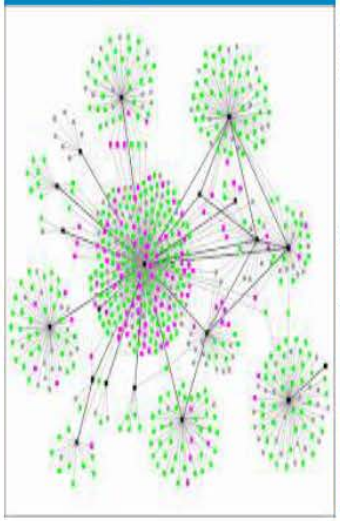
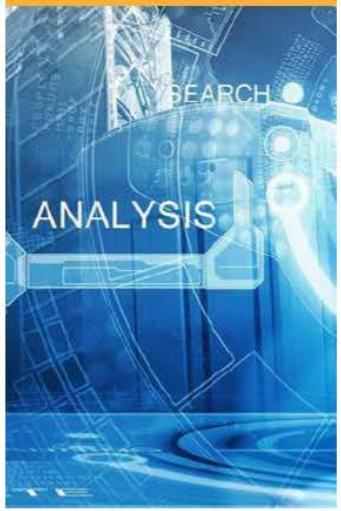

Automation
machine
Temp Min
Temp Max
Temp Ambient
15,56 C
33,94 C
32,33 C
Date
Time
Job
XX-XX-XXXX
XX:XX
WW75D76
Customer
Status
Scale
MAX

- Data Sources
- Data Lake
- Data Analysis
  - Description
  - Diagnostic
  - Predictive
  - Prescriptive
- Business Decisions




YOUR
SPEED

Operating Model Digital Transformation

Connected products	Connected assets	Connected processes	Decision making	OT/IT organizations
				

Source: IDC Manufacturing Insights, 2016

In the words of leading manufacturers

GE Brilliant Factory

- “Get Connected, Get Insights, Get Optimized”
- 530 plants in total. 75 in 2016

Airbus Factory of the Future

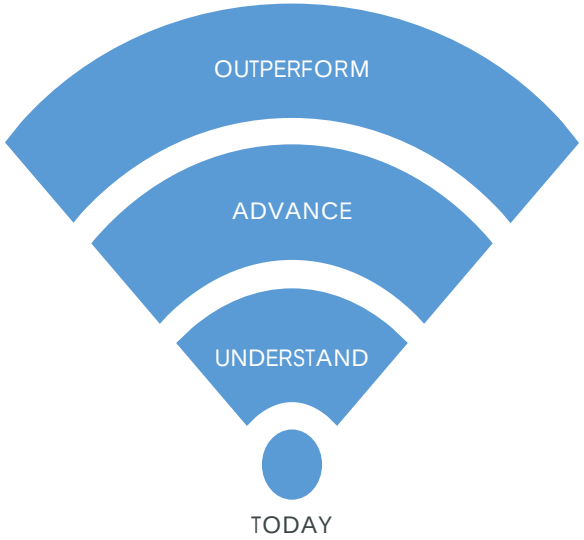
- “Future digital technology will be introduced everywhere in the factory”

DENSO “Dantotsu” Factories

- “Linking 130 factories at home and abroad by 2020”

Vision & Thought Leadership

Journeys of Transformation



Partner Ecosystem

McKinsey&Company

GE

amazon web services

salesforce

Hewlett Packard Enterprise

OSIsoft.

NATIONAL INSTRUMENTS

servicemax

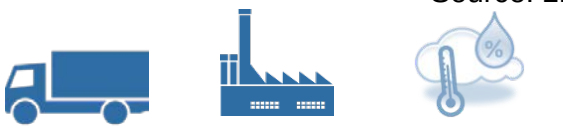
SAP

BOSCH

IIoT is transforming the technology landscape

ISA95 Model - **"Systems of record"**

Source: LNS Research, 2015



IIoT is transforming the technology landscape

ISA95 Model - **"Systems of record"**

L5	Governance and Planning Systems	ADOPTION: Moderate · DECISIONS: Months/Years · NETWORK: Enterprise
L4	Business Systems	ADOPTION: Broad · DECISIONS: Days/Weeks · NETWORK: Enterprise
L3	Manufacturing Operations Management	ADOPTION: Limited · DECISIONS: Seconds/Minutes/Hours · NETWORK: Enterprise/Plant
L2	Equipment and Process Control	ADOPTION: Broad · DECISIONS: Sub-Second · NETWORK: Plant
L1	Sensors, Instrumentation, Data Collection	ADOPTION: Broad · DECISIONS: Sub-Second · NETWORK: Plant
L0	Production Assets and Materials	

Source: LNS Research, 2015

IoT

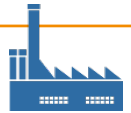
- Augmented Reality
- Application Enablement
- Edge & Big Data Analytics
- Hybrid/Cloud
- Mobile
- Connectivity

"Wrap and Extend"

"System of engagement"

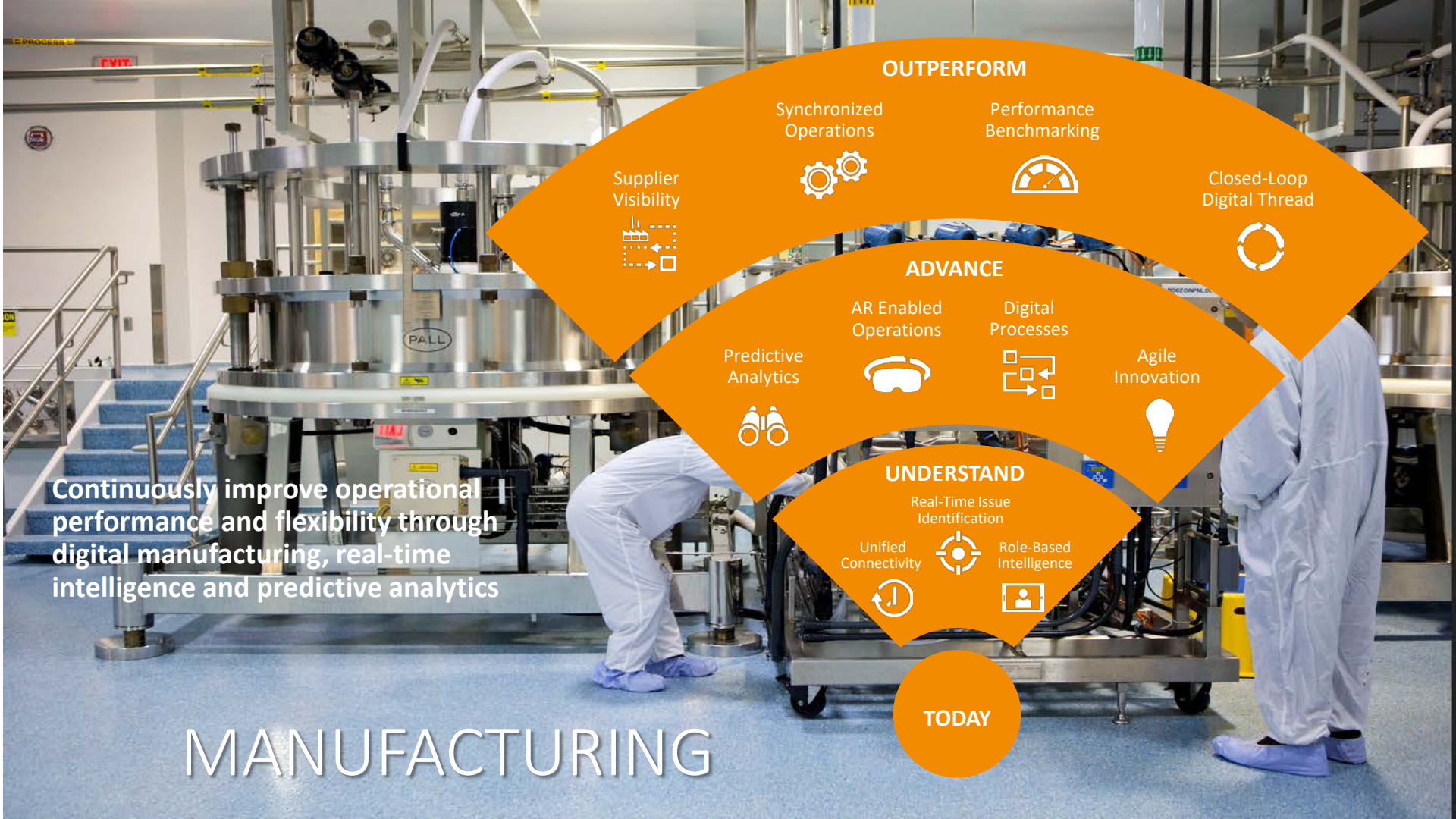
- Connected
- Real-time
- Predictive
- Flexible
- Mobile & augmented

Logistics



Suppliers

Environmental

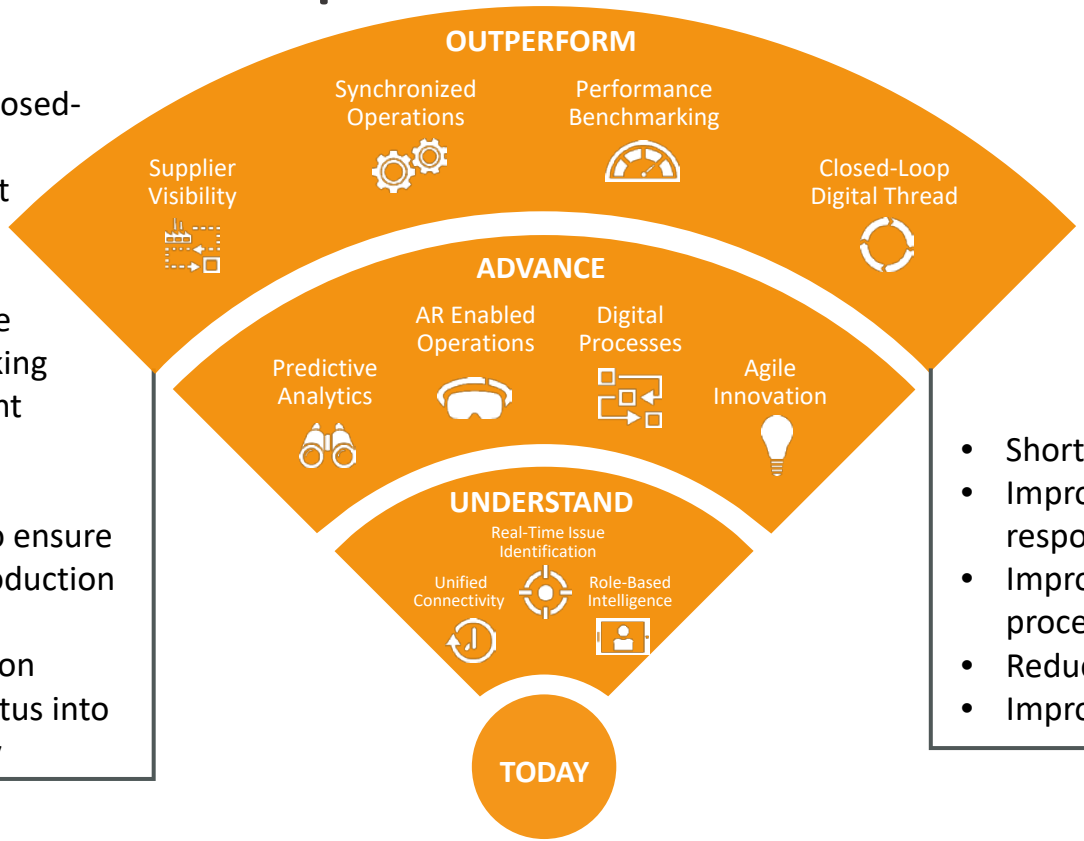


Continuously improve operational performance and flexibility through digital manufacturing, real-time intelligence and predictive analytics

MANUFACTURING

Stage Three: Outperform

- Deploy physical-digital closed-loop processes to drive continuous improvement
- Implement consistent KPIs and operations-wide performance benchmarking to identify and implement best practices
- Synchronize resources to ensure flawless execution of production
- Obtain supplier production visibility to gain early status into performance and quality



- Shorten lead times
- Improve agility and responsiveness
- Improve and perfect production processes
- Reduce unplanned downtime
- Improve profitability

Three stages of transformation

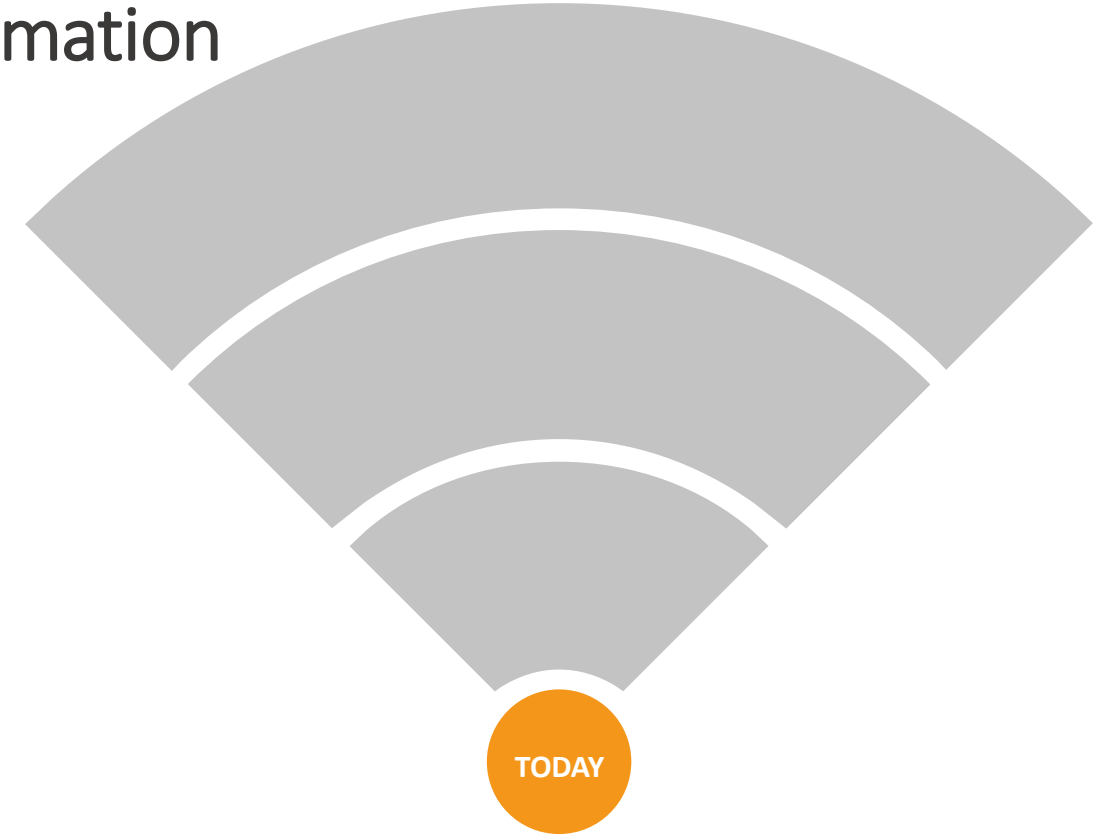
Rapidly and continuously improve your operational performance and flexibility through digital manufacturing, real-time intelligence and predictive analytics

Understand

Advance

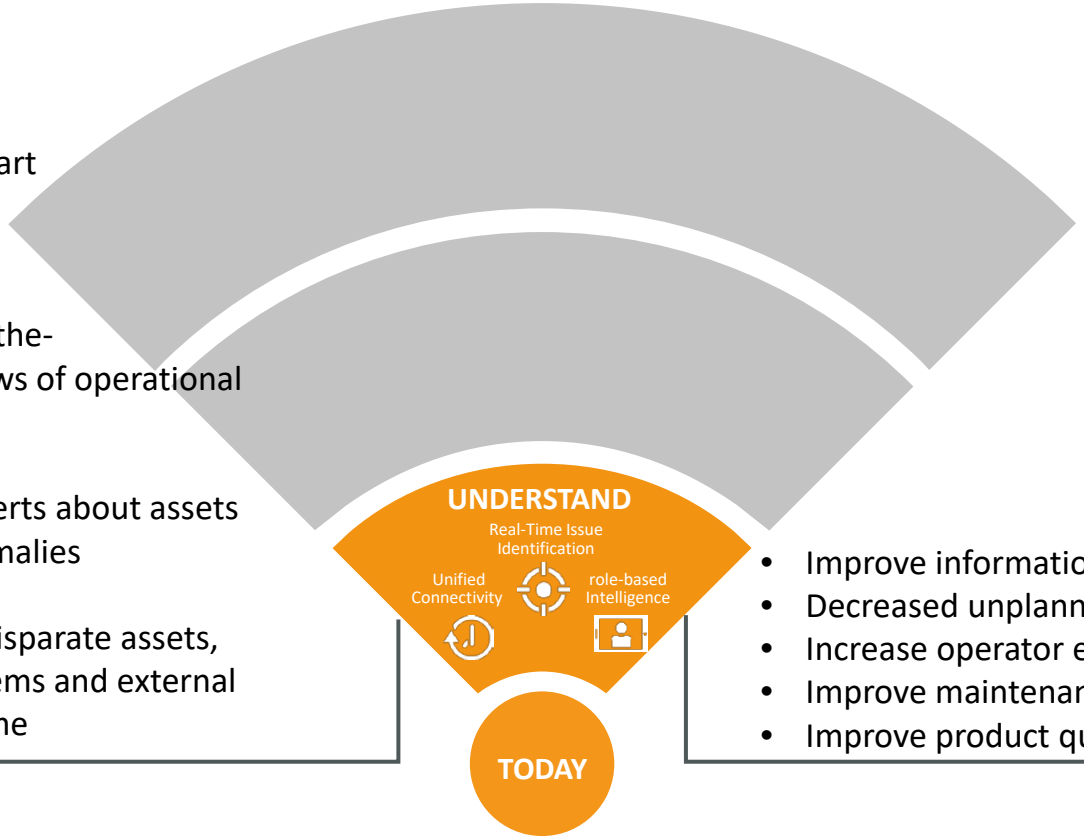
Outperform

The first step is recognizing the value of transformation



Stage one: Understand

- Enhance existing infrastructure with smart sensors and modern technologies
- Simplify data in up-to-the-minute role-based views of operational performance
- Broadcast real-time alerts about assets and performance anomalies
- Connect diverse and disparate assets, sensors, business systems and external data sources in real time



- Improve information quality & reliability
- Decreased unplanned downtime
- Increase operator efficiency
- Improve maintenance efficiency
- Improve product quality

Stage one: Understand

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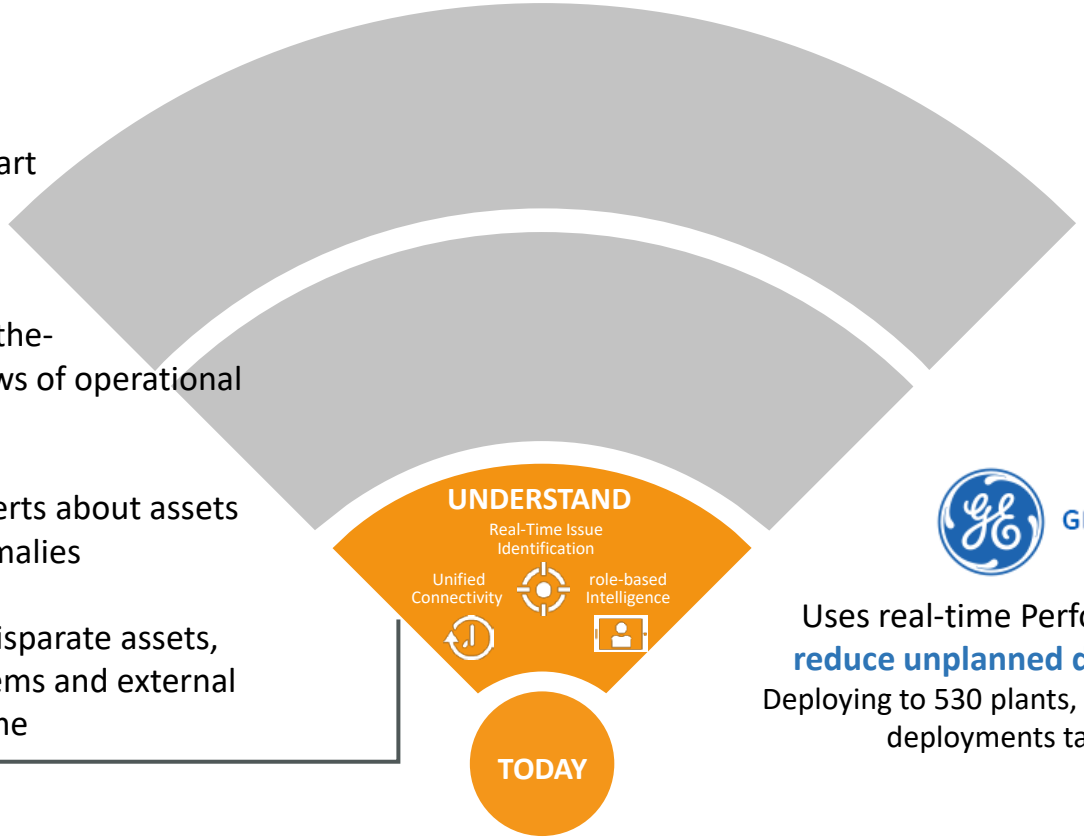

GE Transportation

Uses real-time Performance Visibility to **reduce unplanned downtime by 10-20%**
Deploying to 530 plants, targeting 75 in 2016, with deployments taking only weeks

Stage one: Understand

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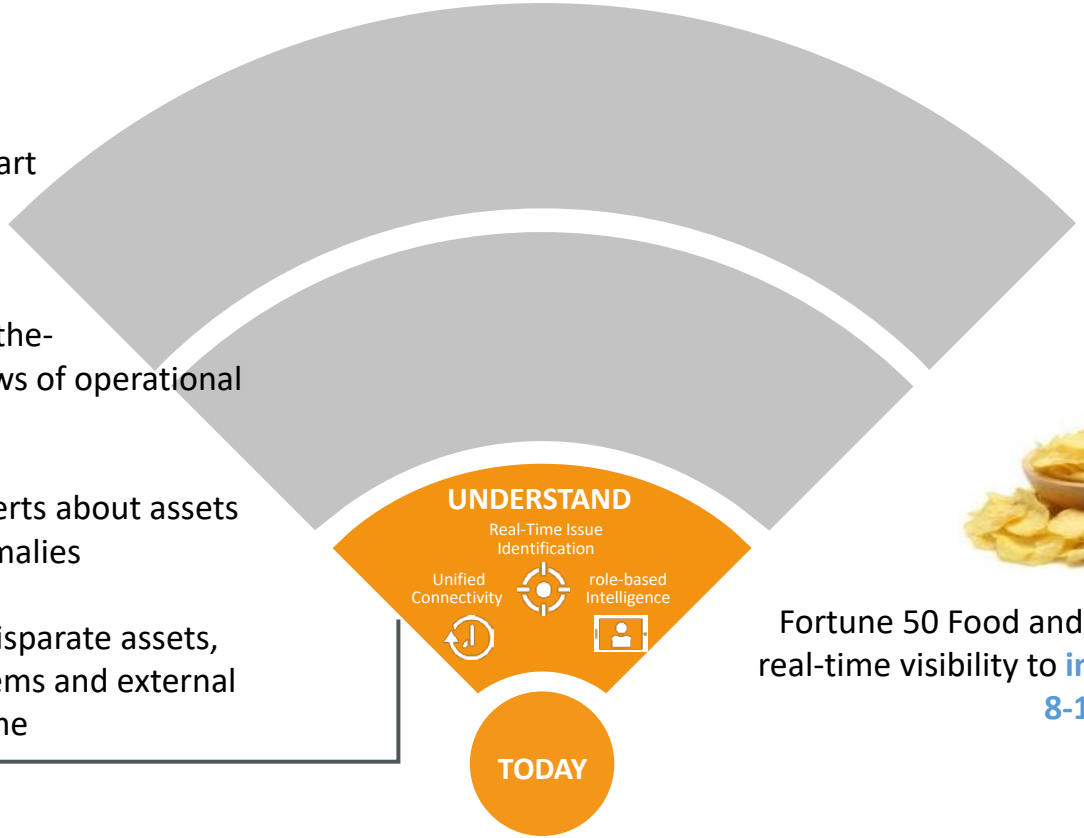


Fortune 50 Food and Beverage leader uses real-time visibility to **improve productivity by 8-10%**

HIROTEC

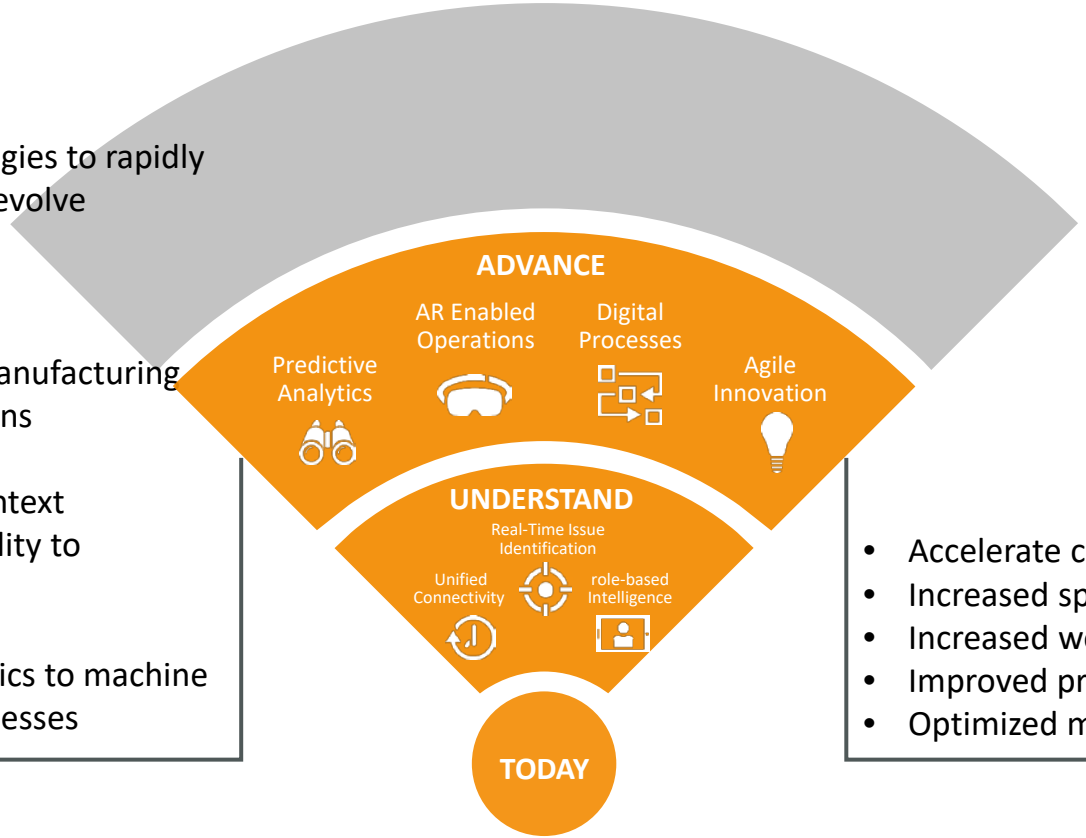
Enabling Timely Data Driven Decisions
- Rapid Time to Value with 6 weeks IoT sprints

GE Transportation, Grove City

10 to 20% reduction in unplanned downtime

Stage two: Advance

- Utilize agile methodologies to rapidly create & continuously evolve manufacturing applications
- Digitally design your manufacturing processes & quality plans
- Employ intuitive, in-context 3D and augmented reality to guide workers
- Apply predictive analytics to machine health and quality processes



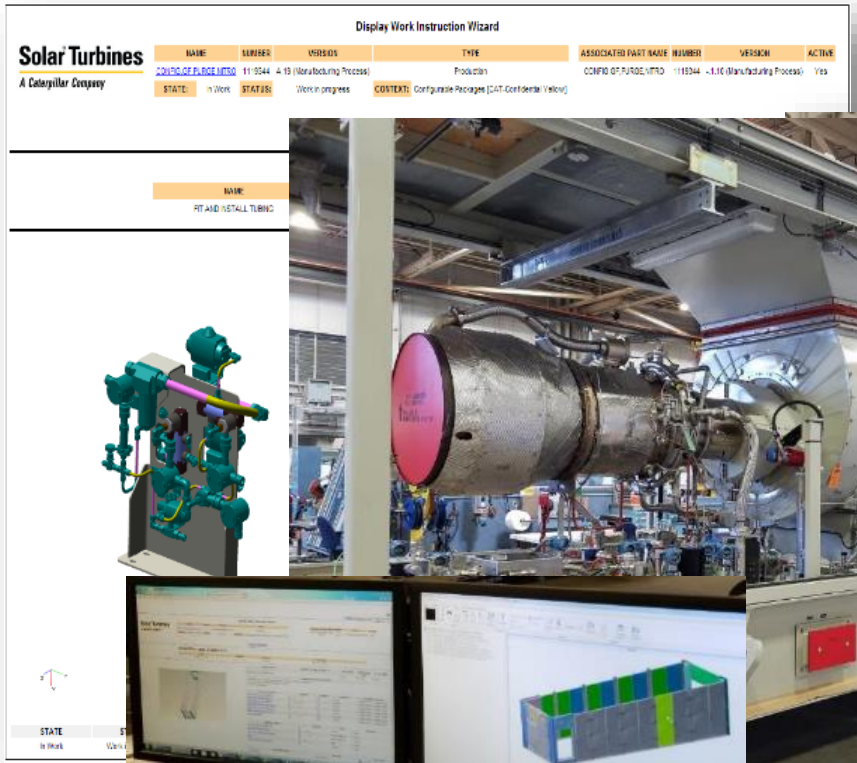
- Accelerate continuous improvement
- Increased speed and flexibility
- Increased workforce efficiency
- Improved product quality
- Optimized maintenance processes

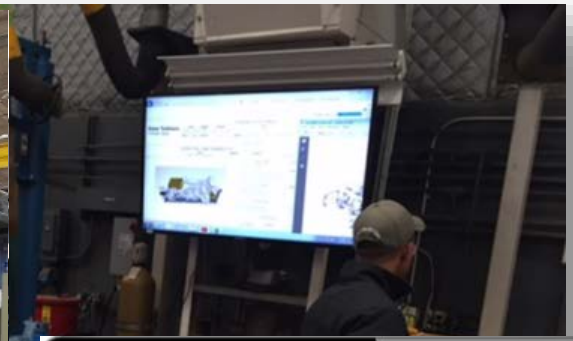
Smart, connected assembly line for improved quality

AIRBUS

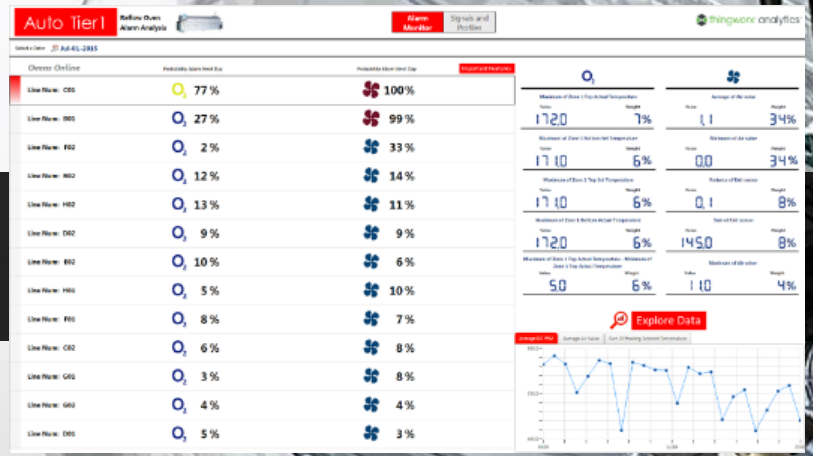
Leading aircraft manufacturer with €40 billion in revenue and 55,000 employees

Solar Turbine





Predictive maintenance to reduce unplanned downtime



Predicting alarms 24 hours in advance, with a 91% accuracy

Predictive maintenance allied to Augm

"Large German automotive manufacturer has reduced downtime loses by over 40K euros per minute, upon implementing PTC predictive maintenance".

Stage two: Advance

- Utilize agile methodologies to rapidly create & continuously evolve manufacturing applications
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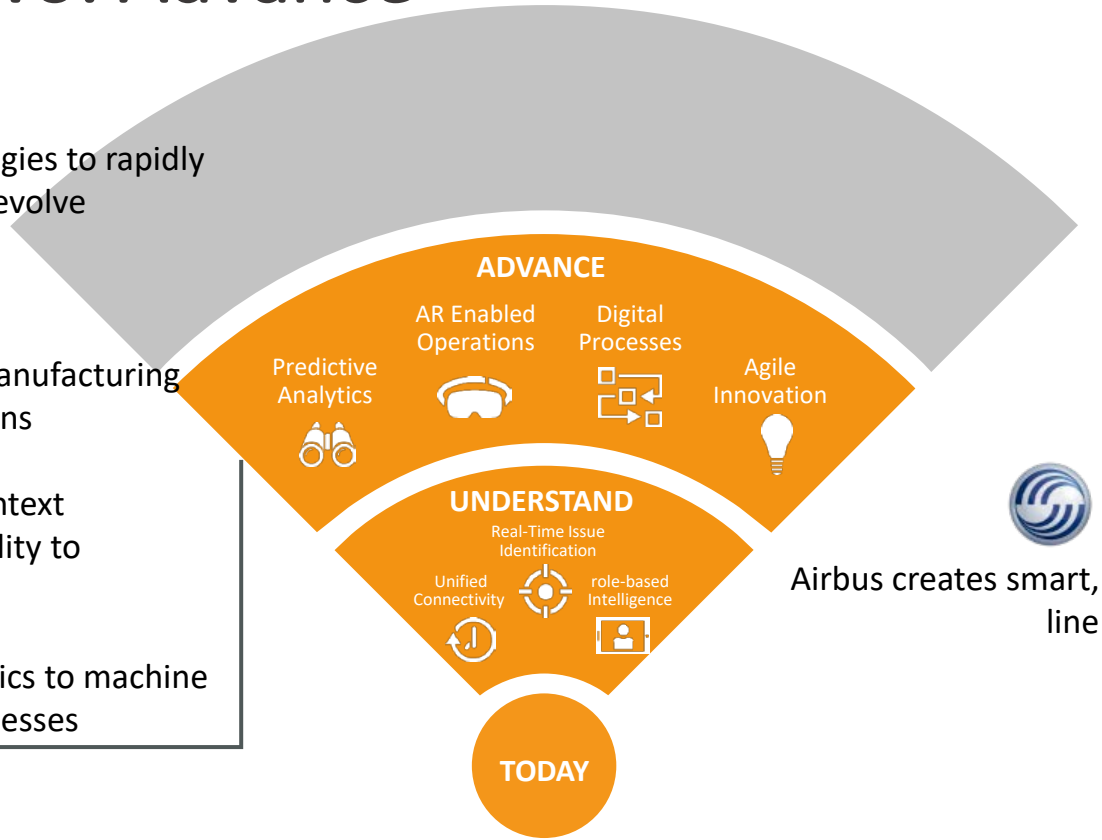

AIRBUS

Airbus creates smart, connected assembly line for improved quality

Stage two: Advance

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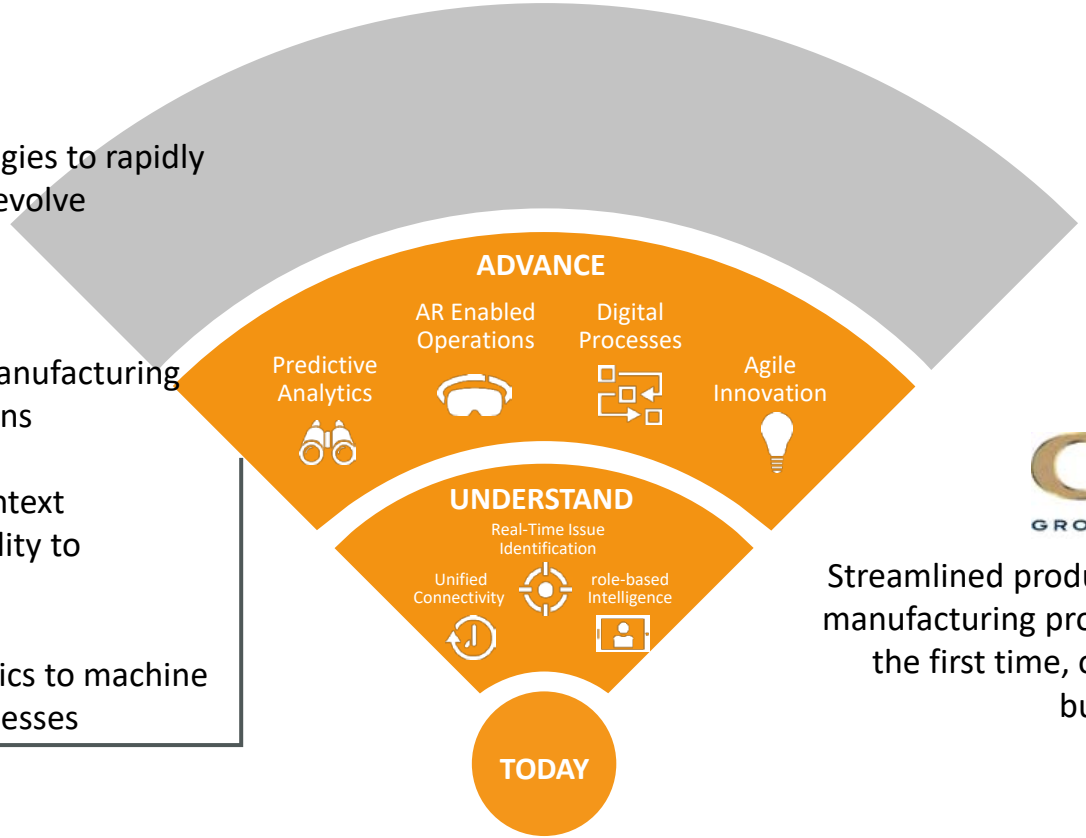
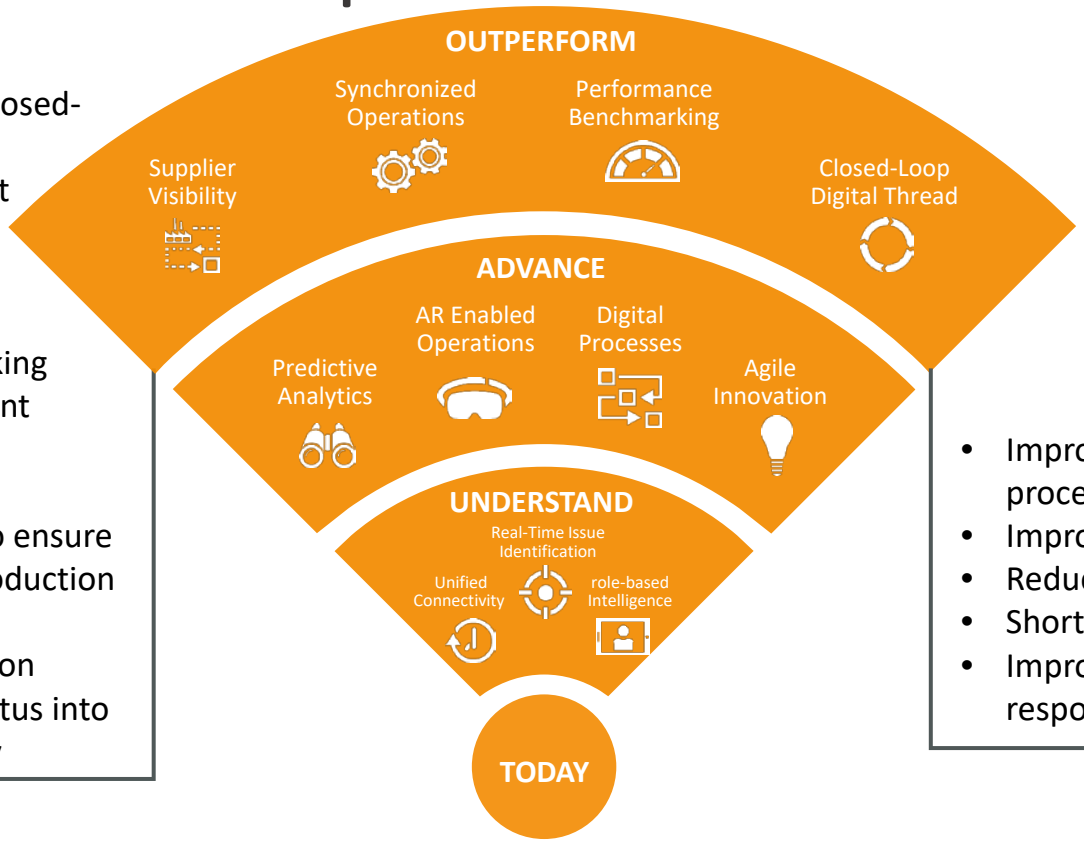


CNB GROUPE BÉNÉTEAU

Streamlined product development and manufacturing processes, delivering for the first time, on time and under budget

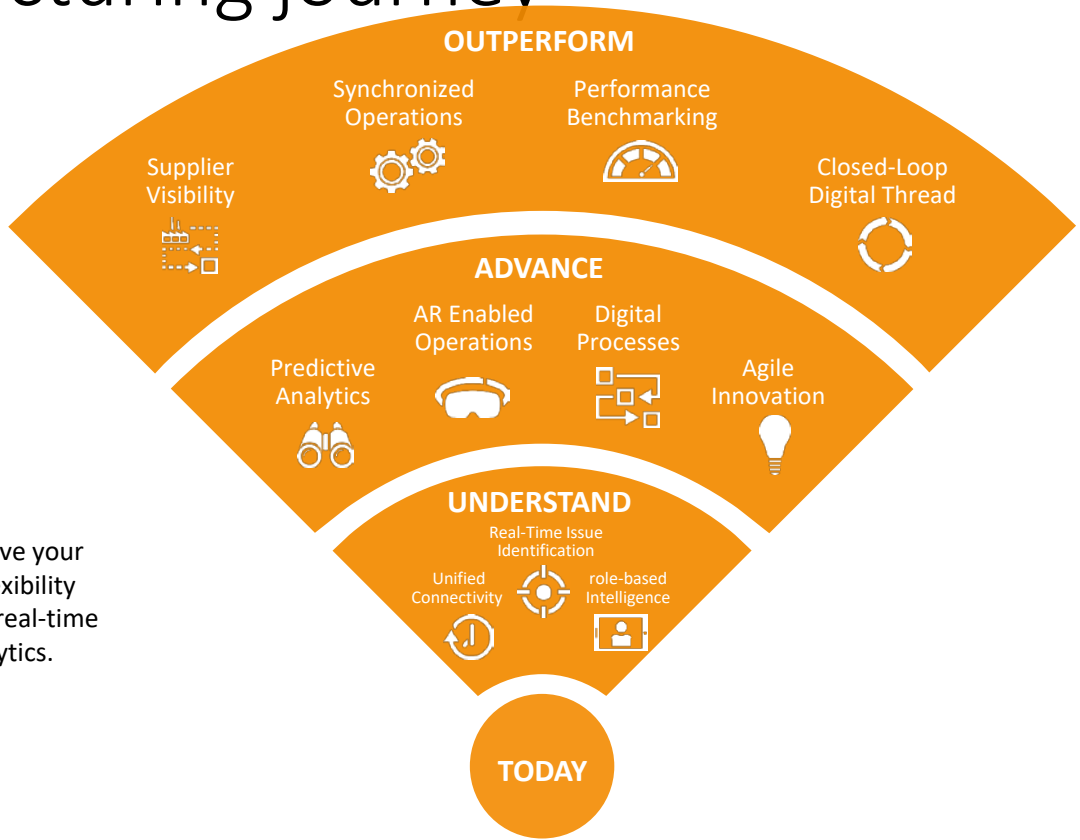
Stage Three: Outperform

- Deploy physical-digital closed-loop processes to drive continuous improvement
- Implement consistent KPIs and corporate-wide performance benchmarking to identify and implement best practices
- Synchronize resources to ensure flawless execution of production
- Obtain supplier production visibility to gain early status into performance and quality



- Improve and perfect production processes
- Improve profitability
- Reduce unplanned downtime
- Shorten lead times
- Improve agility and responsiveness

Manufacturing journey



Rapidly and continuously improve your operations performance and flexibility through digital manufacturing, real-time intelligence and predictive analytics.

Unified Connectivity

Unified Connectivity

One unified data source provides real-time operational information from disparate assets, sensors, systems and external sources

- **Accelerates speed** and reduce costs associated with connecting to disparate sources of information
- Improves **quality and reliability** of information by providing direct access to existing sources and status
- Extend the life of and **return** on **invested capital** by enabling new processes that span silos of IT and OT data

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PTC Solutions:

- ThingWorx Platform
- Kepware
- Q3 – Kinex for Manufacturing

Partners:

Hewlett Packard Enterprise

CISCO

NATIONAL INSTRUMENTS

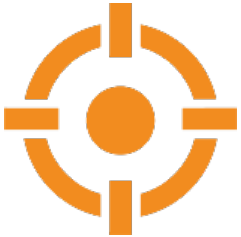
Customers:

Cascades

HIROTEC AMERICA

GE Transportation

real-time issue identification



Real-Time Issue Identification

Status and performance of assets, production processes, and product quality are monitored in real-time. Anomalies and alerts are communicated via text, e-mail, web, and mobile dashboards.

- Reduces **unplanned downtime** with real-time-status notifications
- Improves **product quality** through anomaly detection and 'out-of-spec' alerts
- Improves operator **safety** with hazardous condition alerts

PTC Solutions:
- ThingWorx Platform
- Q3 – Kinex for Manufacturing

Partners:

Hewlett Packard Enterprise

CISCO

NATIONAL INSTRUMENTS

Customers:

HIROTEC AMERICA

GE Transportation

Role-Based Intelligence

Role-Based Intelligence

Real-time, actionable, role-based access to operational information enables proactive and faster decision making

- Increases **performance** with real-time visibility to production status and KPI's
- Improves **maintenance efficiency** with real-time visibility to asset status, condition and maintenance schedules
- Increases **operator efficiency** with unified, accurate, operation-specific information
- Improves **product quality** with real-time execution monitoring and quality validation

PTC Solutions:

- ThingWorx Platform
- Q3 – Kinex for Manufacturing

Customers:

AIRBUS

HIROTEC AMERICA

GE Transportation

Predictive Analytics

Predictive Analytics

Maintenance, quality, and performance issues are predicted in real-time by applying machine learning to data from assets, sensors, and business systems

- Reduces **unplanned downtime** and **optimizes maintenance** planning and execution by predicting asset time-to-failure
- Reduces **cost of quality** by identifying collations in quality patterns and root causes
- Optimizes **energy consumption** by identifying energy costs in correlation to production execution
- Reduces **safety risks** by predicting hazardous situations before they occur

PTC Solutions:

- ThingWorx Platform
- Q3 – Kinex for Manufacturing

Customers:

Automotive Tier 1 Supplier

Leading Tire Manufacturer

Augmented reality Enabled Operations

AR Enabled Operations

Immersive factory experiences improve training, work instructions, quality validation, maintenance execution, and operations monitoring by layering digital information onto the user's physical world

- Increases **workforce efficiency** and flexibility by delivering easy-to-consume, guided instructions
- Dramatically **improves training** speed and outcomes through cognitively rich digital / physical user experiences
- **Improves quality** assurance through use of AR as a quality- control visual validation technique
- **Improves safety** by making workers aware of in-context safety risks

PTC Solutions:

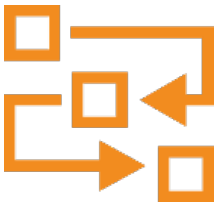
- ThingWorx Studio and ThingWorx View
- MPMLink

Customers:

Solar Turbines
A Caterpillar Company

Large German Automotive Manufacturer

Digital Processes



Digital Processes

Manufacturing processes, quality plans, and work instructions are defined and delivered digitally

- Accelerates **time-to-volume production** through the digital validation of manufacturing processes
- Improves **operator efficiency** through delivery of 3D/AR work instructions and in-process quality validation
- Improves **product quality** by defining control characteristics and validation requirements from the 3D models
- Accelerates **change propagation** with associative engineering and manufacturing change management

PTC Solutions:

- ThingWorx Platform
- Windchill MPMLink

Customers:

AIRBUS

Solar Turbines
A Caterpillar Company

CNB
GROUPE BENETEAU

Agile Innovation

Agile Innovation

Continuous improvement is executed with unprecedented speed and minimal risk, utilizing agile methodologies to rapidly create and continuously evolve innovative manufacturing applications

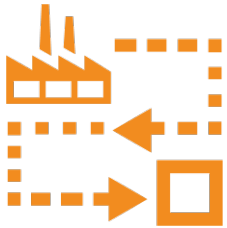
- Accelerates **continuous improvement** initiatives with a ‘start small and scale fast’, data-driven approach to factory innovation
- Achieves **ROI in days** and weeks, by rapidly mashing-up real-time information from disparate sources
- Increases innovation capacity by **empowering business experts** with code-less application development

PTC Solutions:
- ThingWorx Platform
- Q3 – Kinex for Manufacturing

Customers:

HIROTEC AMERICA

Supplier Visibility



Supplier Visibility

Operational visibility is extended to include supplier's production status and quality performance using IoT edge connectivity

- **Reduces inventory** buffers through direct visibility of supplier output and quality
- **Reduces disruptions** due to early visibility into supplier material shortages
- Improves **agility and responsiveness** to volatile demand due to enhanced supplier visibility

PTC Solutions:

- ThingWorx Platform
- Q3 – Kinex for Manufacturing

Synchronized Operations

Synchronized Operations

Aligned availability of assets, materials, tooling, and labor, at the right time and location to ensure flawless execution of production orders

- **Reduces unplanned downtime** due to misaligned resources
- **Shortens lead times** by reducing scheduling buffers associated with resource allocation
- Optimizes **production execution** by coordinating scheduling with resource availability

PTC Solutions:
- ThingWorx Platform

Partners:

Ubisense

aruba NETWORKS an HP company

Performance Benchmarking

Performance Benchmarking

Standardized KPIs are used across assets, cells, lines, and factories to identify and disseminate best practices

- Enables **better decision-making** and accountability through standardized KPI's that reveal key **opportunities for improvement**
- Improves **profitability** by replicating **best practices** across enterprise operations

PTC Solutions:

- ThingWorx Platform (Connectivity and Foundation)
- Q3 – Kinex for Manufacturing

Customers:

Automotive Tier 1 Supplier

Closed-Loop Digital Thread

Closed-Loop Digital Thread

Physical manufacturing processes are compared with digital models to identify opportunities for continuous improvement.

- Uses closed-loop feedback from production to identify product **design improvements**
- Identifies manufacturing **process and quality improvements** based on production outcomes
- Continuously assesses gaps between the physical/digital realities to **improve and perfect production** processes

PTC Solutions:

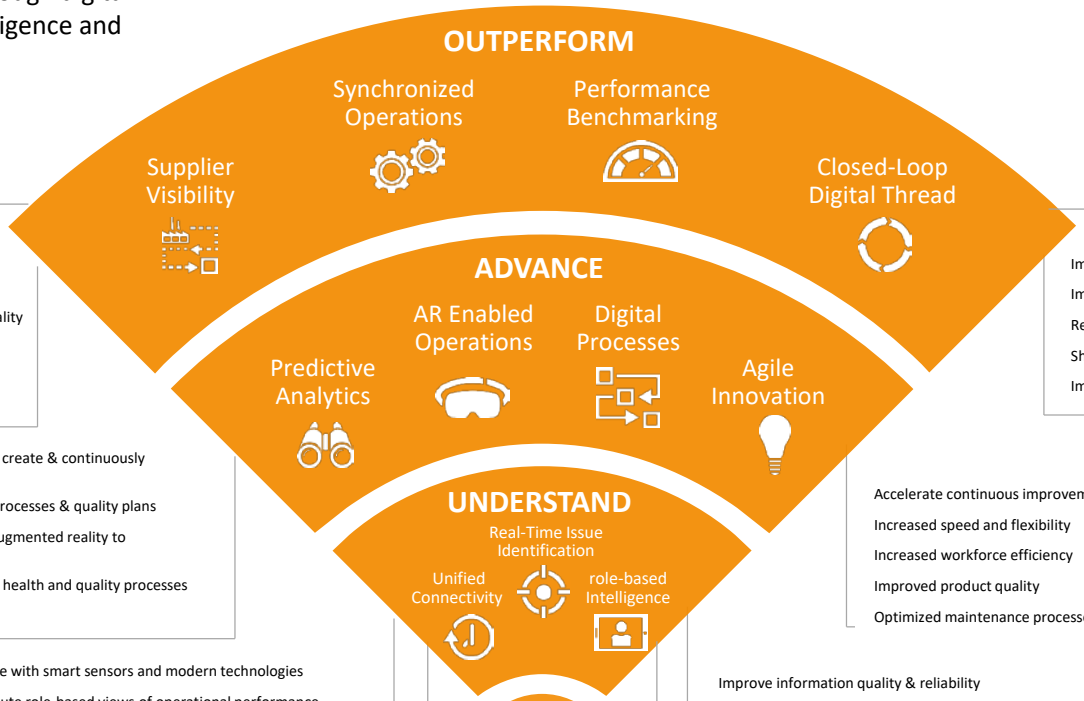
- ThingWorx Platform (Connectivity, Foundation, analytics)
- MPMLink
- Q3 – Kinex for Manufacturing

Customers:

CNB
GROUPE BENETEAU

Manufacturing journey

Continuously improve your operations performance and flexibility through digital manufacturing, real-time intelligence and predictive analytics.



How to get there

Utilize agile methodologies to rapidly create & continuously evolve manufacturing applications

Digitally design your manufacturing processes & quality plans

Employ intuitive, in-context 3D and augmented reality to guide workers

Apply predictive analytics to machine health and quality processes

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Enhance existing infrastructure with smart sensors and modern technologies

Simplify data in up-to-the-minute role-based views of operational performance

Broadcast real-time alerts about assets and performance anomalies

Connect diverse and disparate assets, sensors, business systems and external data sources in real time

Results

Improve and perfect production processes

Improve profitability

Reduce unplanned downtime

Shorten lead times

Improve agility and responsiveness

Accelerate continuous improvement

Increased speed and flexibility

Increased workforce efficiency

Improved product quality

Optimized maintenance processes

Improve information quality & reliability

Decreased unplanned downtime

Increase operator efficiency

Improve maintenance efficiency

Improve product quality

ROLE-BASED FACTORY USE CASES

Controls Engineer

Plant Manager

Maintenance

Quality

Operator

Process, quality, maintenance planners

Connectivity Status

Operational Intelligence

Asset Health Monitoring

Quality Visibility and Verification

Operator Portal

Augmented Reality and 3D Instruction Authoring

2D, 3D, mobile, augmented reality experiences

Anomaly detection & predictions

Unified visibility & real-time monitoring

thingworx

Connect | **Analyze** | **Create** | **Experience**

PLCS

Gateways

Sensors

Test Equip

Web

Vendor

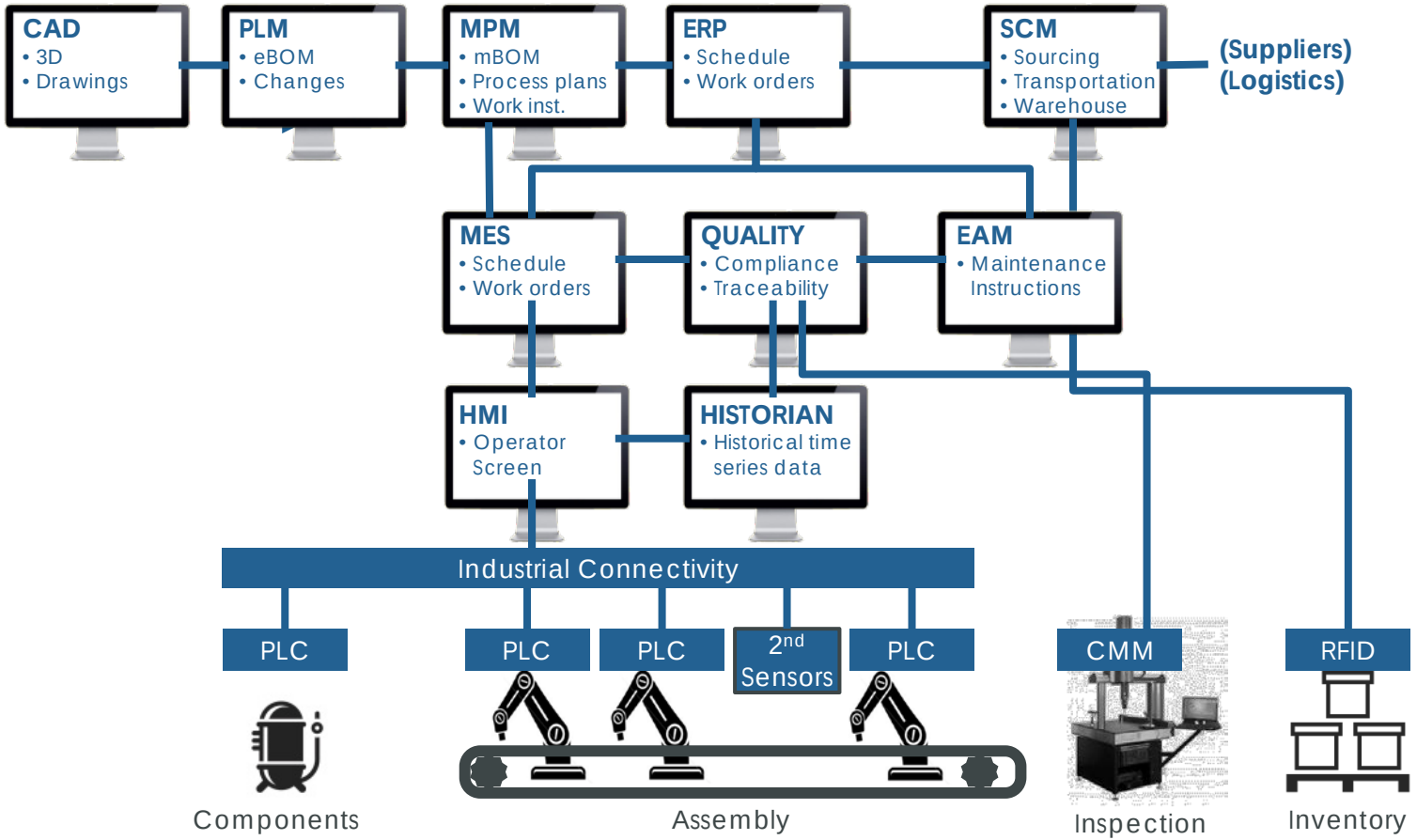
ERP

MES

SCADA

Fleet

FACTORY DATA FLOWS



ISA-95 Mfg Levels

- **L4** (Business planning)
- **L3** (Management)
- **L2** (Monitoring, control)
- **L0/L1** (Sensing)

¿Preguntas?

questões

Вопросы

spørgsmål

kesyon

Domande

vragen

Questions?

الأسئلة

pitanja

שאלות

tanong

Ceisteanna

Fragen

質問

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