

DELIVERING BUSINESS VALUE

WITH SMART CONNECTED PRODUCTS
PTC AND MICROSOFT

Ken Rawlings
VP, Smart Connected Products



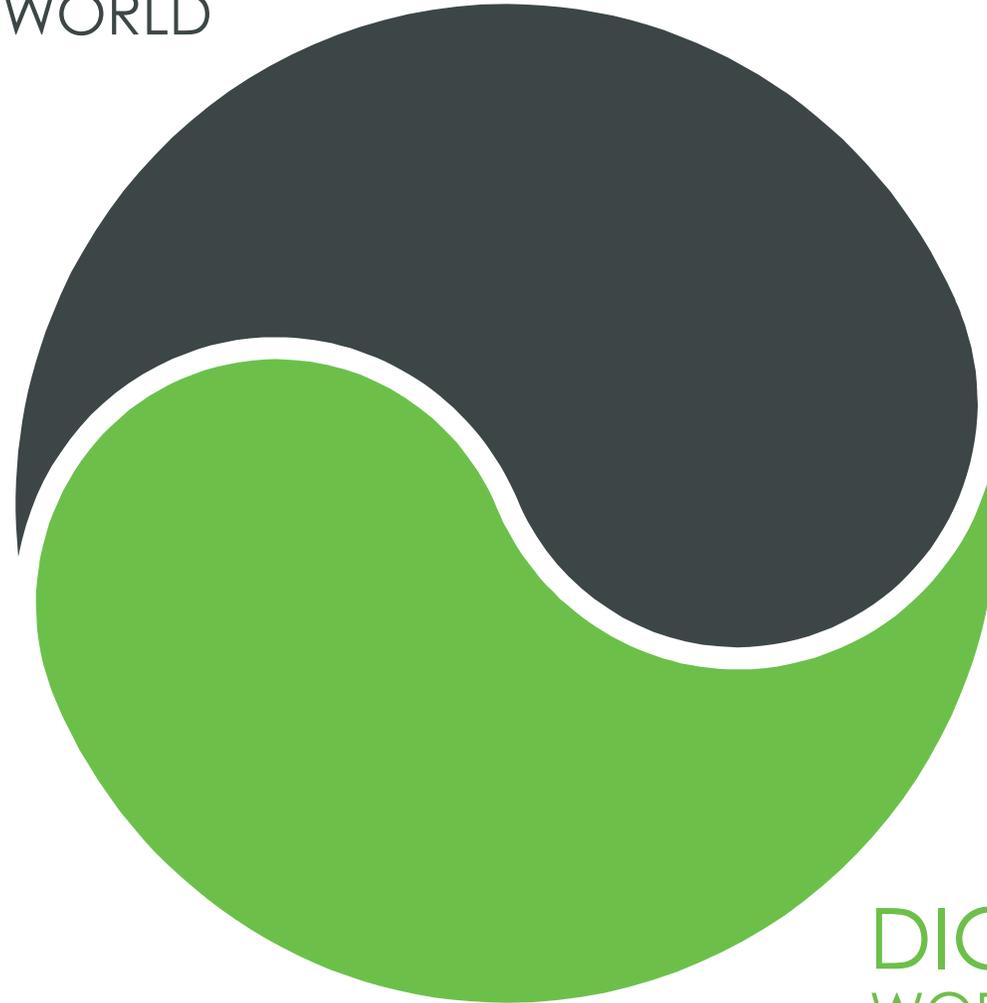
forum
europe

PHYSICAL
WORLD



DIGITAL
WORLD

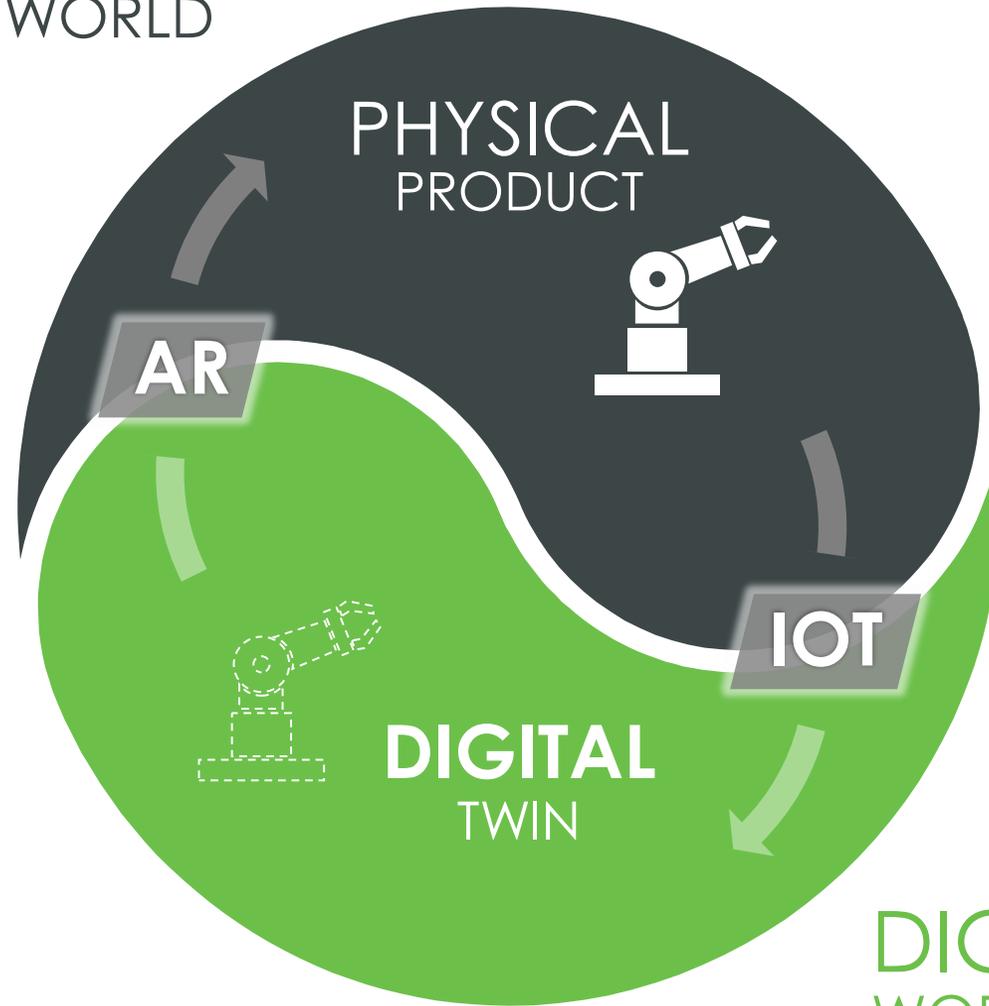
PHYSICAL
WORLD



DIGITAL
WORLD

PHYSICAL
WORLD

SMART
CONNECTED
PRODUCTS



DIGITAL
WORLD

“Traditional processes will fail companies that seek to optimize product value and customer experiences through software enabled IoT products.”

– Nate Fleming,
Forrester



40%

of Top 100 discrete manufacturers plan to provide **Product as a Service** platforms

– IDC

51%

of research respondents who say IoT is critical to their **organization's future success**

– VDC Research

70%

of manufacturers plan to deliver **connected products** to market in the next 12 months

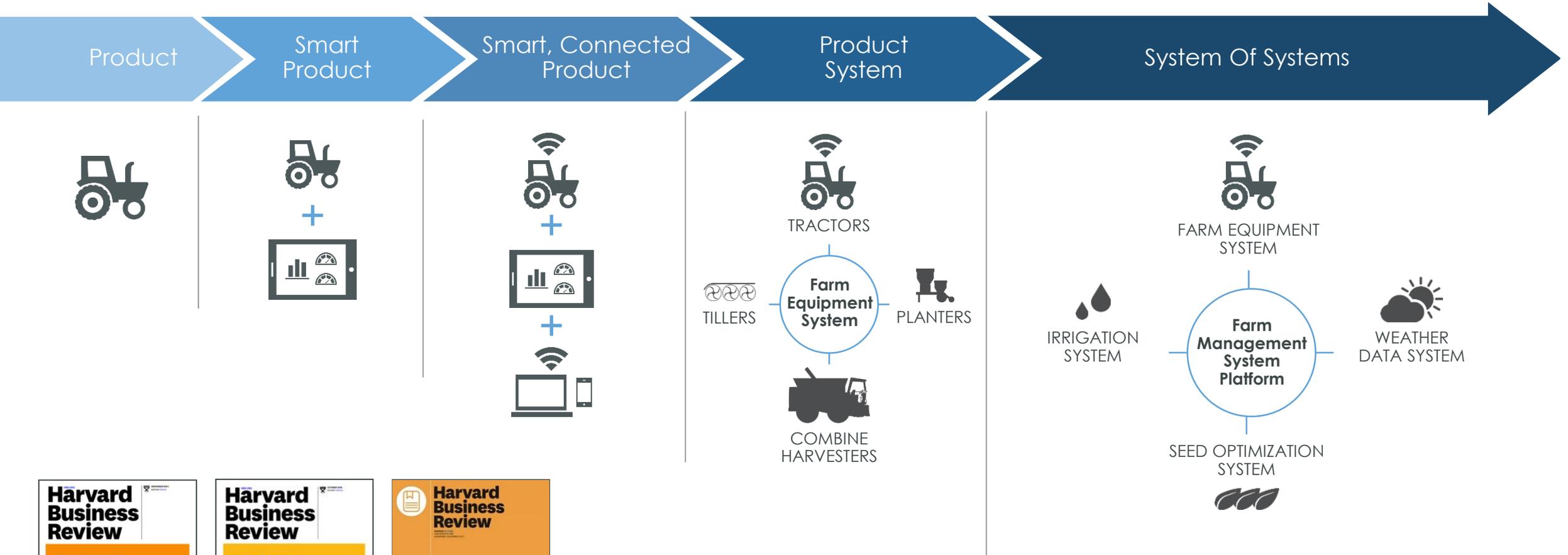
– IDC

The Digital Thread

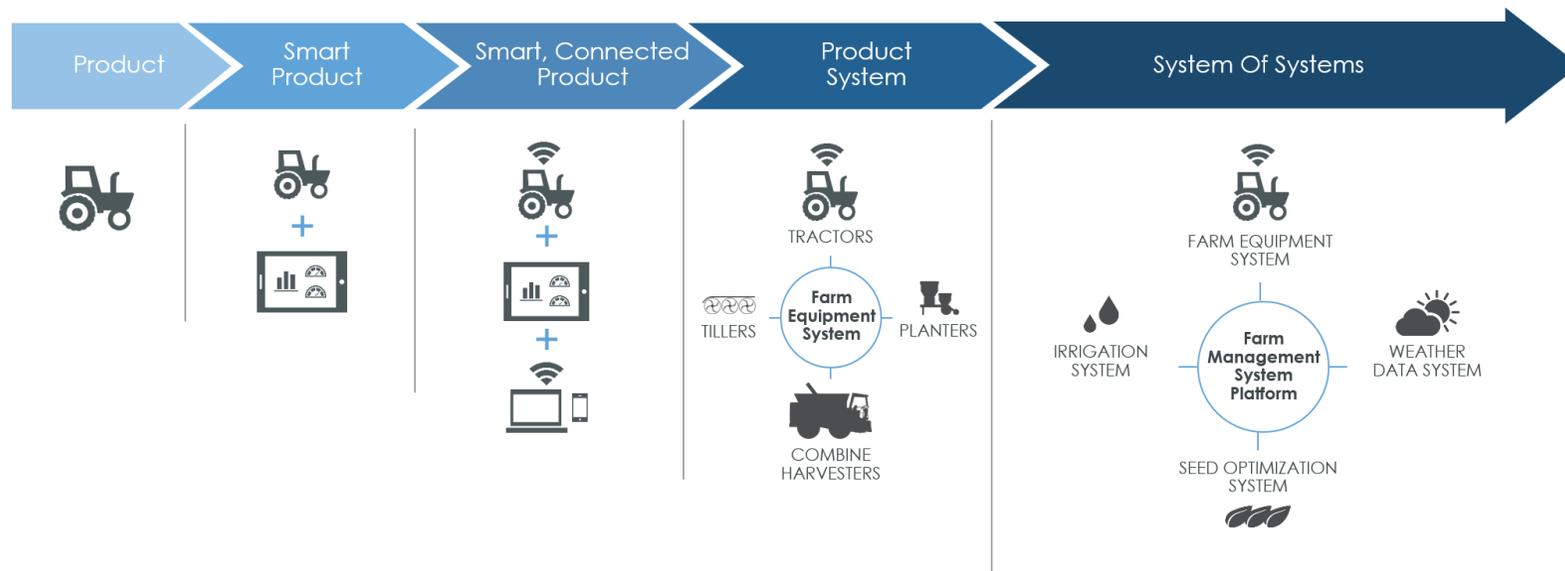
“Unleashing a seamless flow of data across the value chain that will link every phase of the product life cycle: from design, sourcing, testing, and production to distribution, point of sale, and use.”

– McKinsey

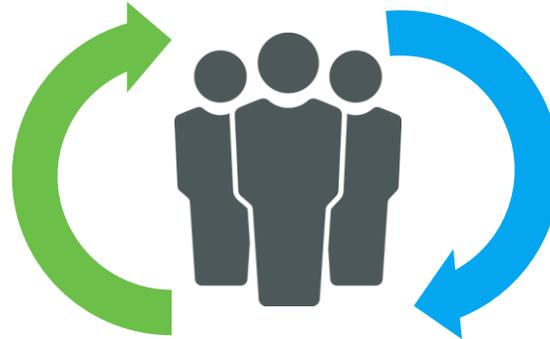
SMART CONNECTED PRODUCT JOURNEY



“...reinvent the way industrial companies design, manufacture, operate, sell and service things with the convergence of the physical and digital worlds”



The Microsoft and PTC partnership accelerates Digital Transformation

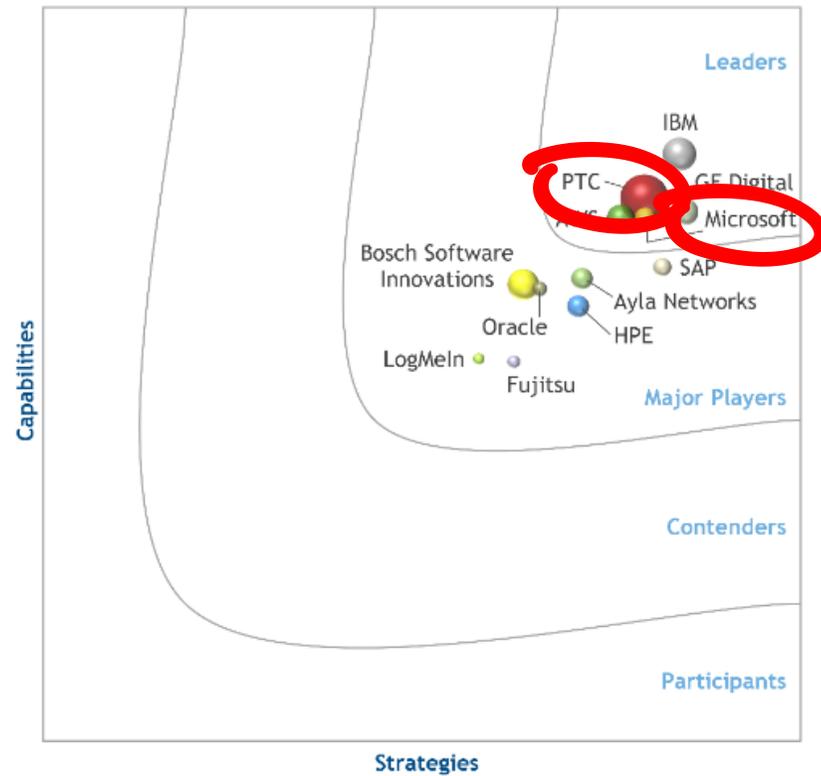


“...**reinvent** the way industrial companies design, manufacture, operate, sell and service things with the **convergence of the physical and digital worlds**”

“...**reimagining** how you bring together people, data and processes to create value for your customers and maintain a **competitive advantage in a digital-first world**”

RECOGNIZED LEADER BY TOP ANALYST FIRMS

Both PTC and Microsoft were named “Leaders” in IoT Platforms



IDC, July 2017
MarketScape: Worldwide IoT Platforms



Forrester, Q3 2018
Forrester Wave: Industrial IoT Software Platforms

DIGITAL TRANSFORMATION



Connected manufacturing and service



Connected product performance feedback and traceability



Automated simulation, artifact creation and collaboration

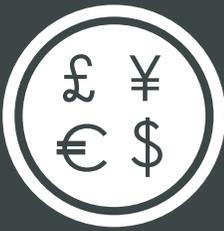
“Far more intense coordination among functions is now required... Customer relationships are continuous and open-ended.”

“Smart, connected products are transforming how companies design, manufacture, operate and service products ... to create and capture value.”

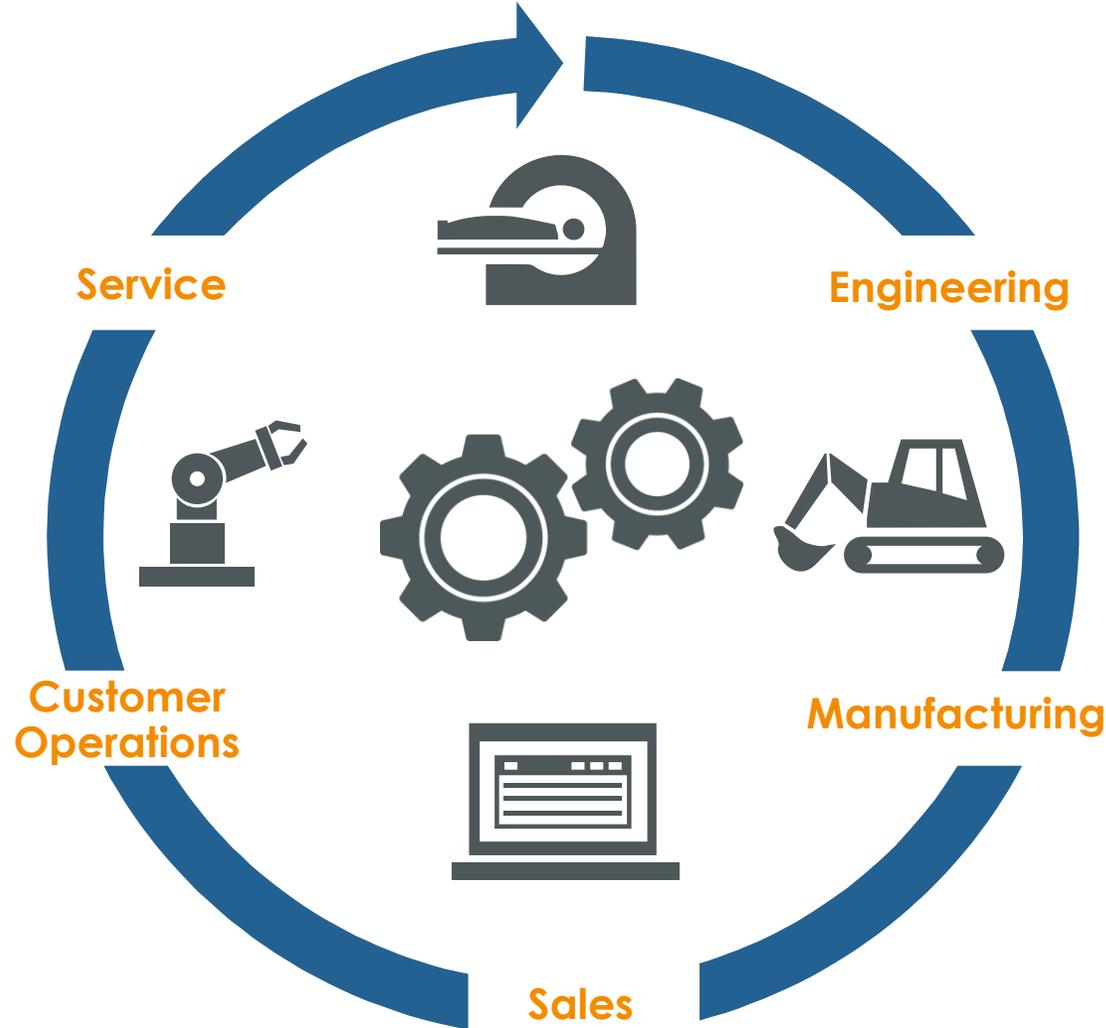
- Michael Porter, Jim Heppelmann, Harvard Business Review

IOT CREATES ENORMOUS BUSINESS OPPORTUNITY



 Improve Customer Experience	 Optimize Internal Processes	 Differentiate Through Innovation	 Drive New Revenue Streams
<p>Leverage data from connected products and systems to increase service revenue and profit with improved first time fix rates and customer satisfaction</p>	<p>Increase operational efficiencies to reduce Operations Downtime, improve Throughput</p>	<p>Accelerate innovation impacting product, service and factory operations that is secure and scalable</p>	<p>Unlock new business models and realize new value-add opportunities such as products as a service, scaling to new markets</p>

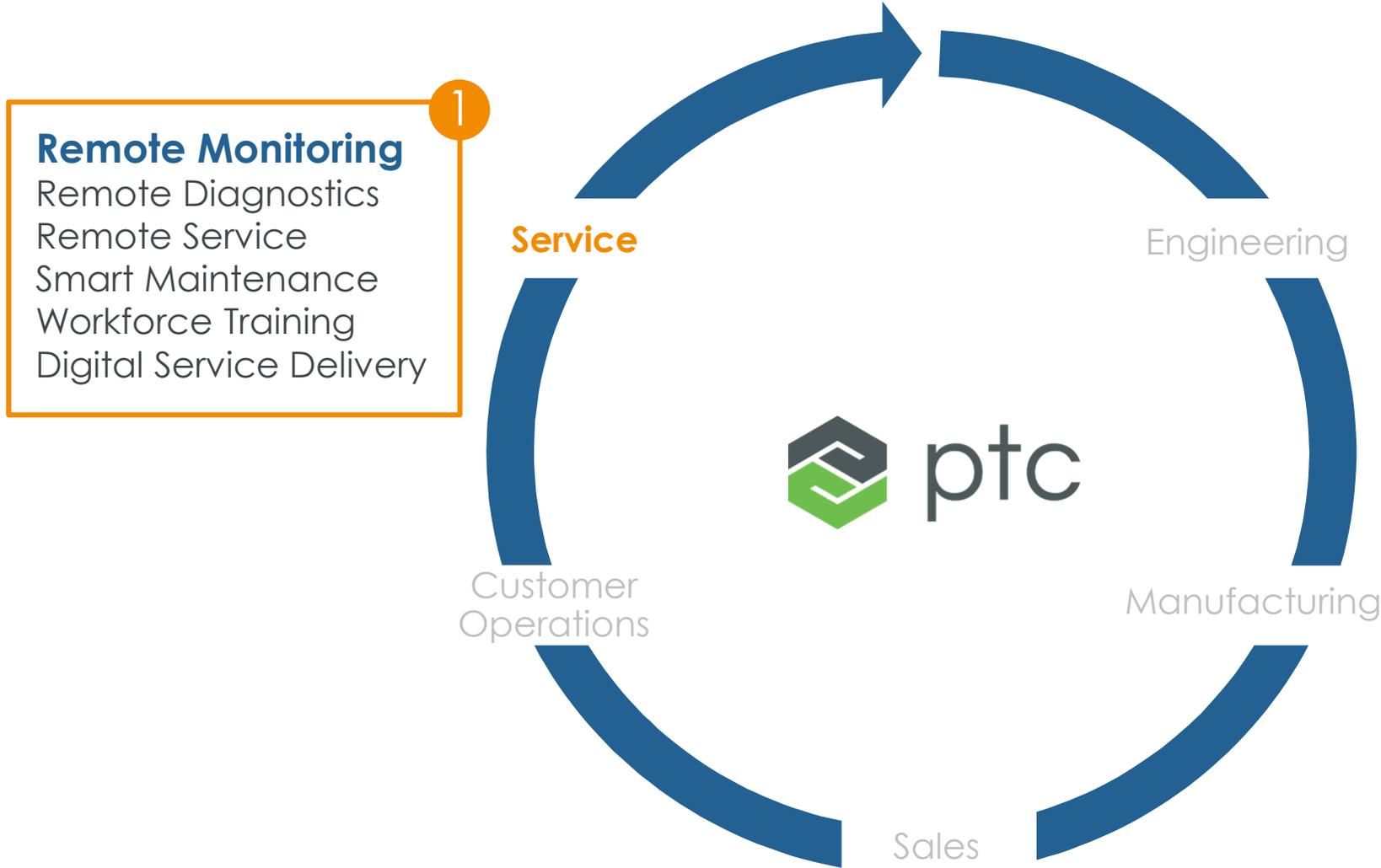
**Entire
Enterprise**



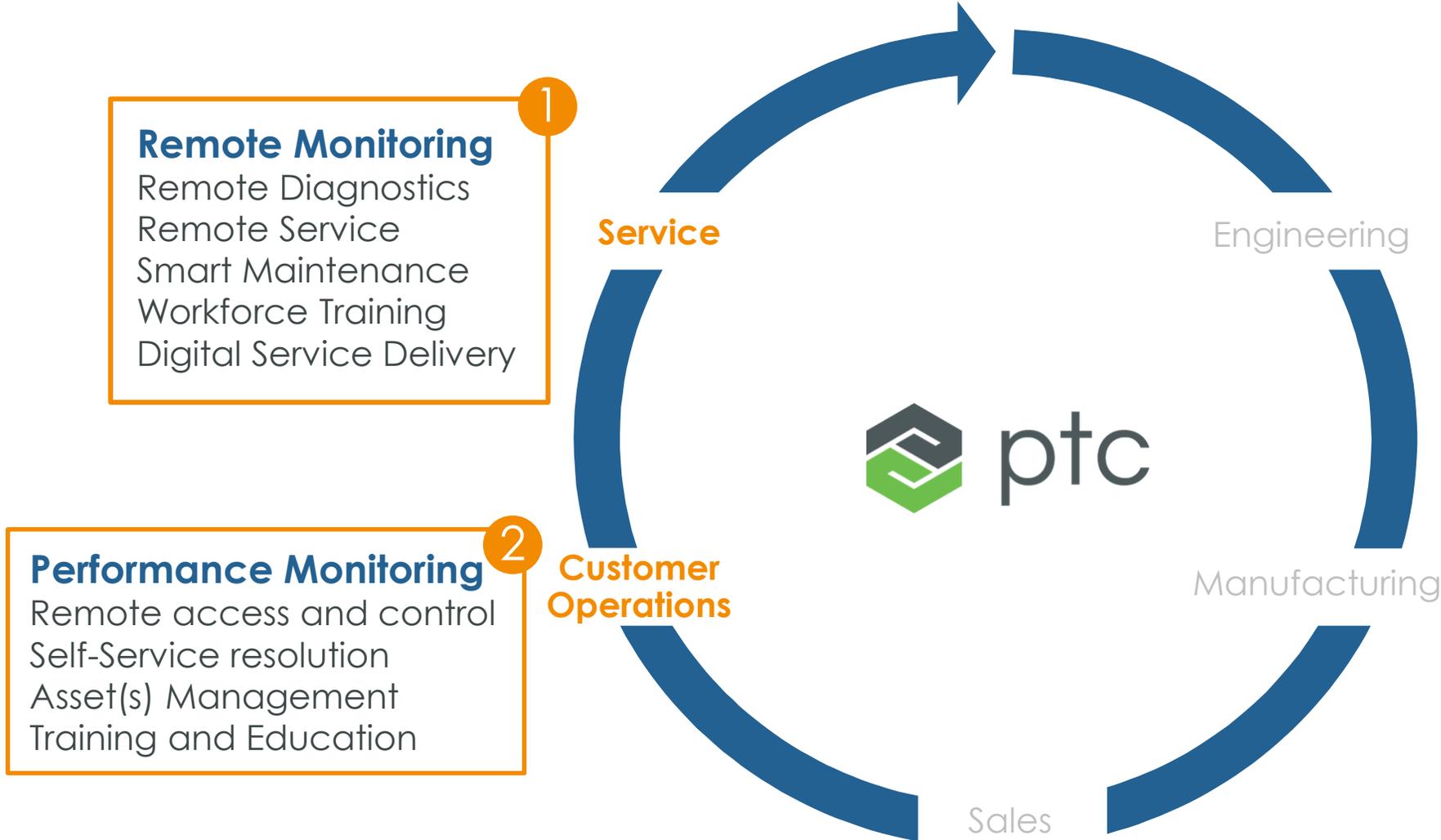
**Across
Multiple
Industries**

Across All Functions

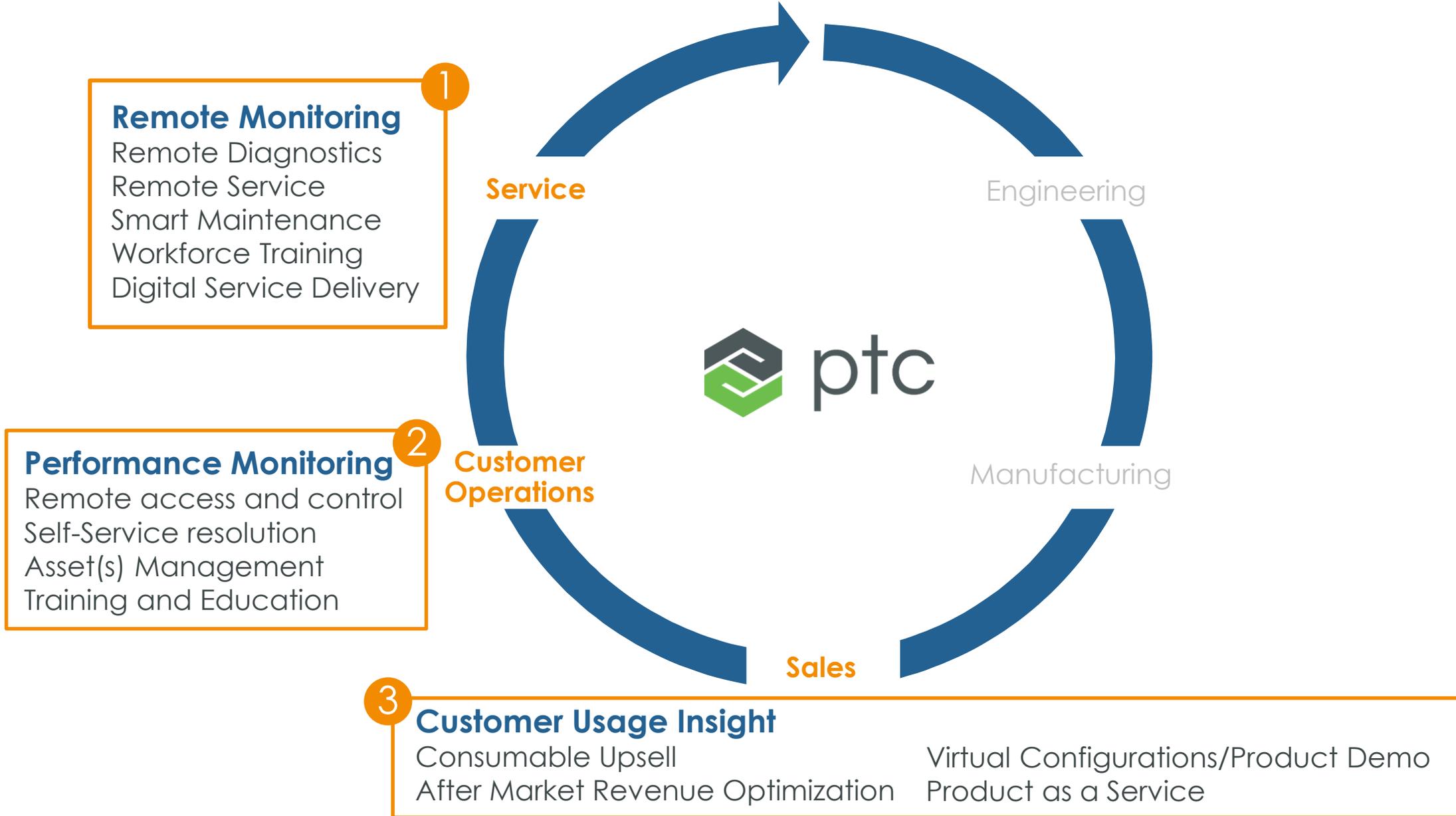
SMART CONNECTED PRODUCT USE CASES



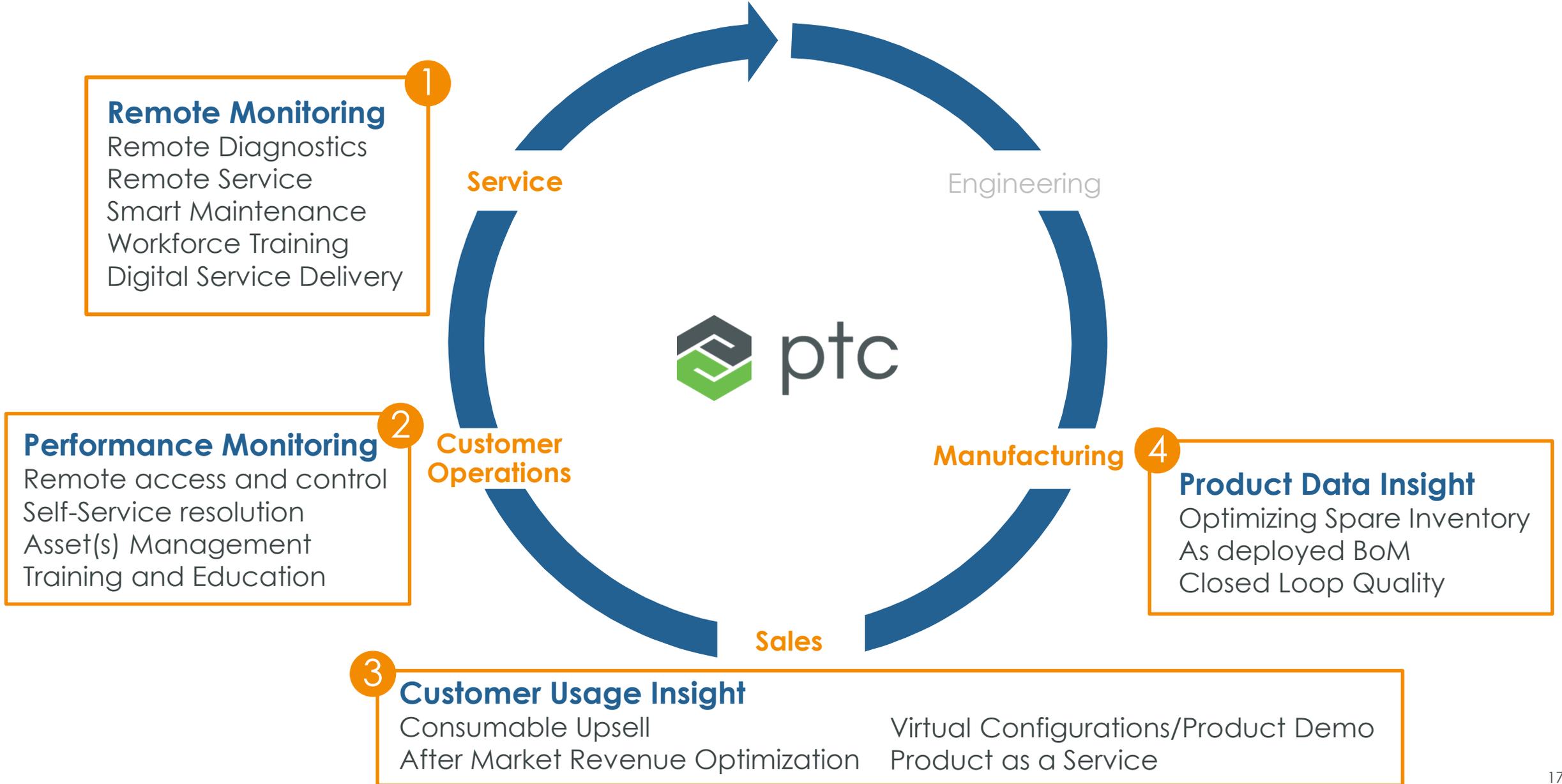
SMART CONNECTED PRODUCT USE CASES



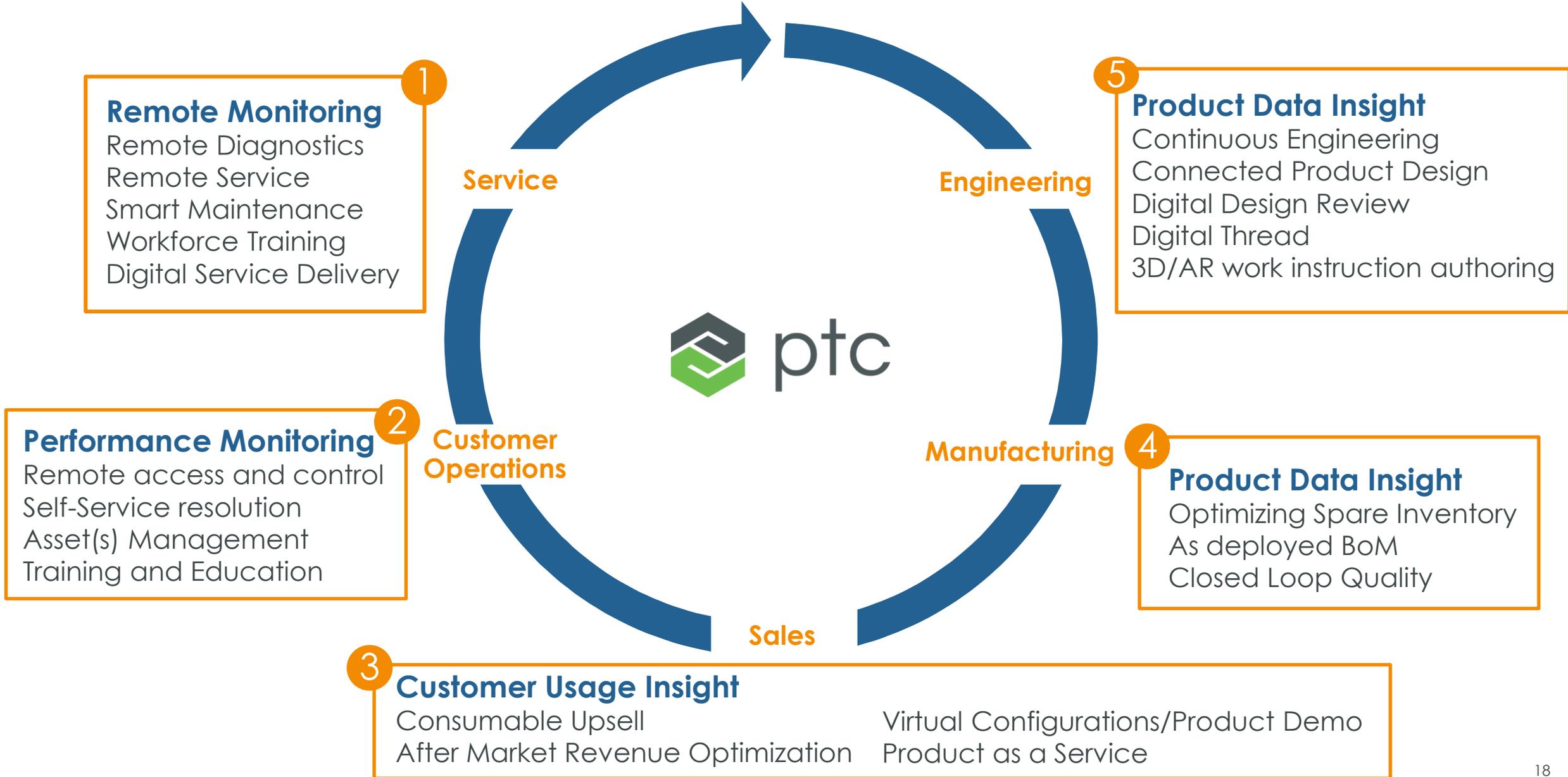
SMART CONNECTED PRODUCT USE CASES



SMART CONNECTED PRODUCT USE CASES



SMART CONNECTED PRODUCT USE CASES



Market research has shown that **revenue** from basic and **value-added services** can **represent** as much as **10 to 30 times the original purchase price** of equipment per year.

- Blumberg

Aftermarket services offer excellent margins — while **aftermarket services** represent approximately 24% of total revenue, it often contributes **40% to 80% of profit**.

- Gartner

THINGWORX CUSTOMER SUCCESS

- **50%** reduction in mean time to repair
- **42%** reduction in on-site visits
- **15% -40%** reduction in unplanned downtime
- Improve first-time first rate from **88% to mid 90%** (industry average 60%)

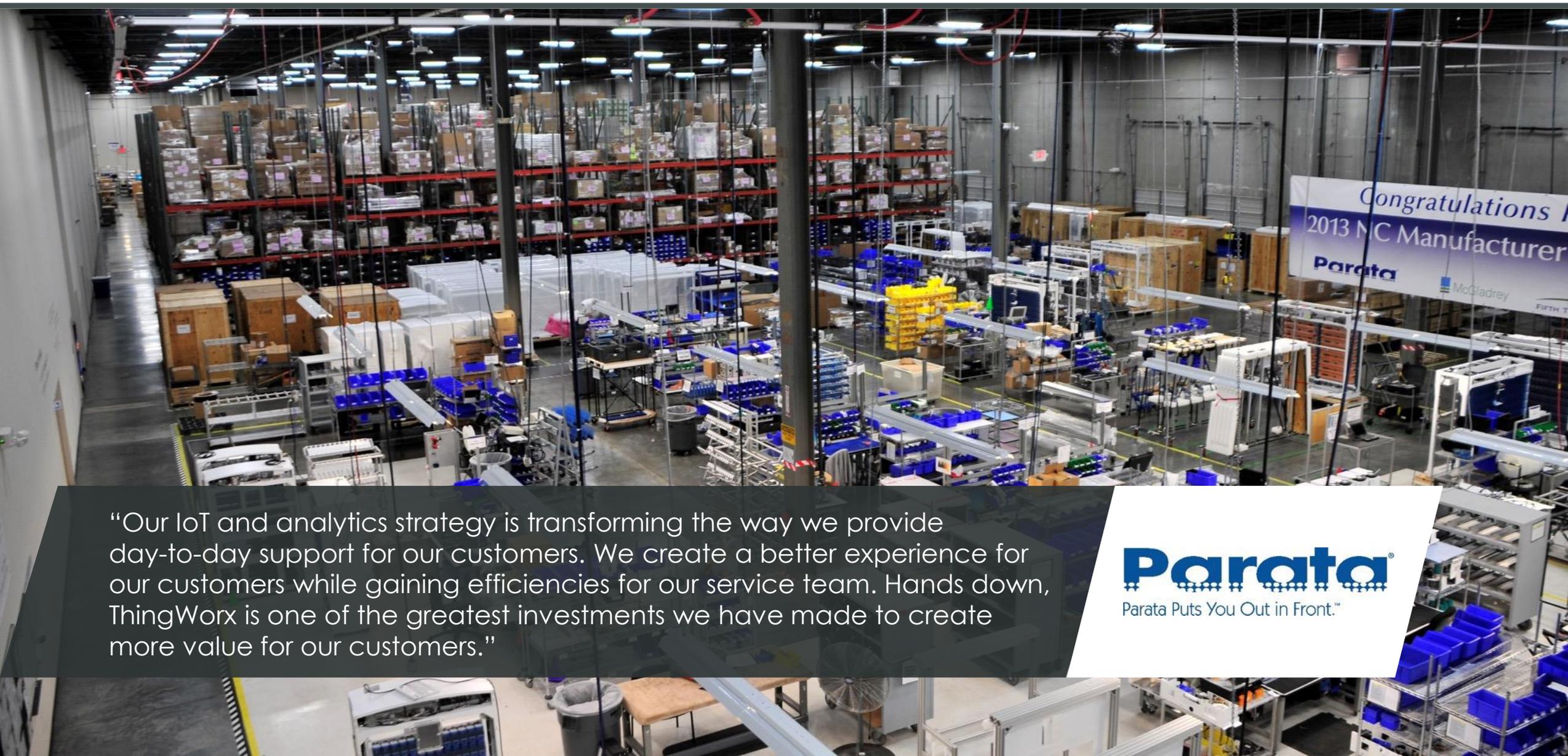
BENEFITS TO ALL ENTERPRISE FUNCTIONS

Parata[®]

Moved from reactive to proactive service



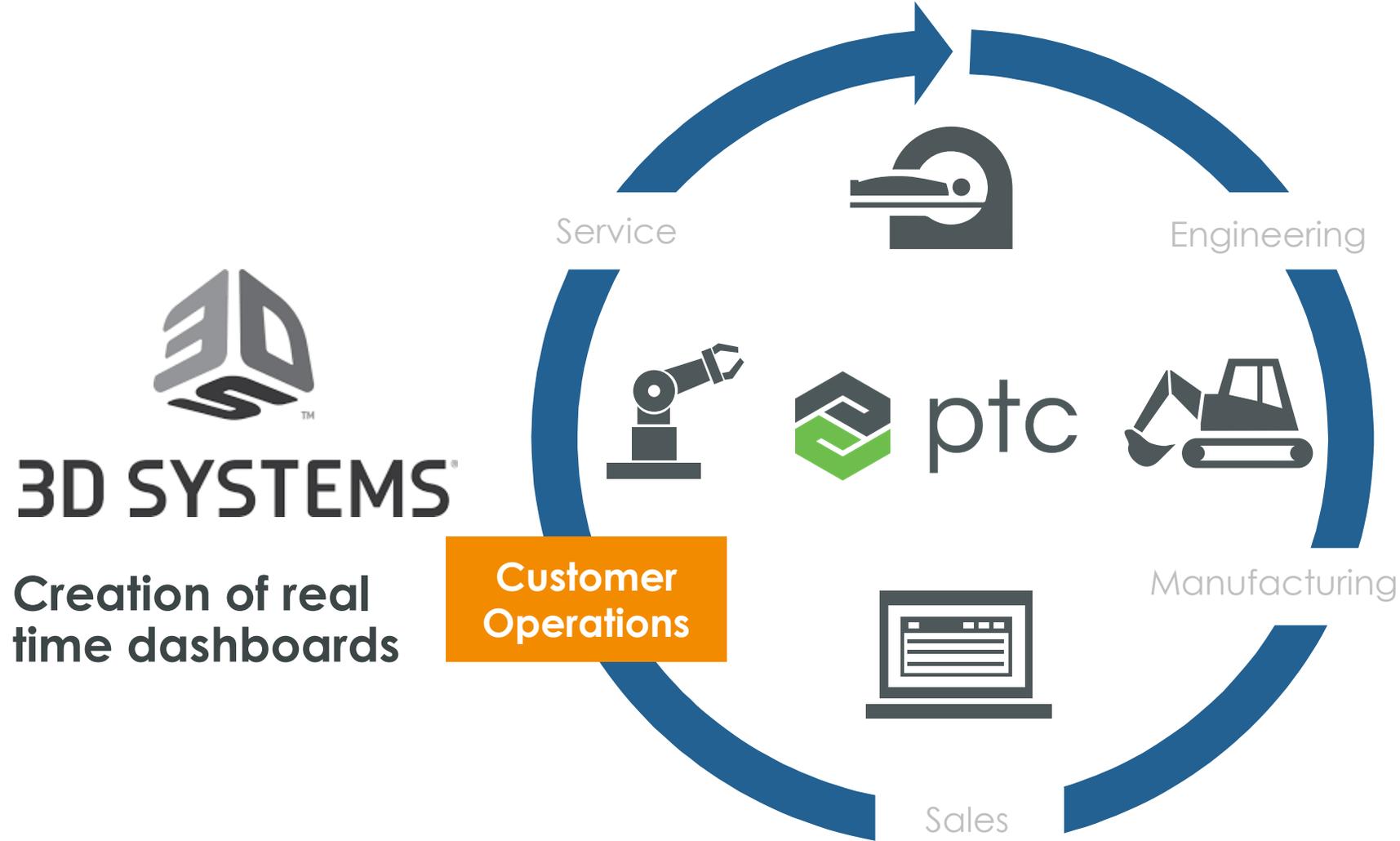
CUSTOMER SATISFACTION WITH PROACTIVE SERVICE



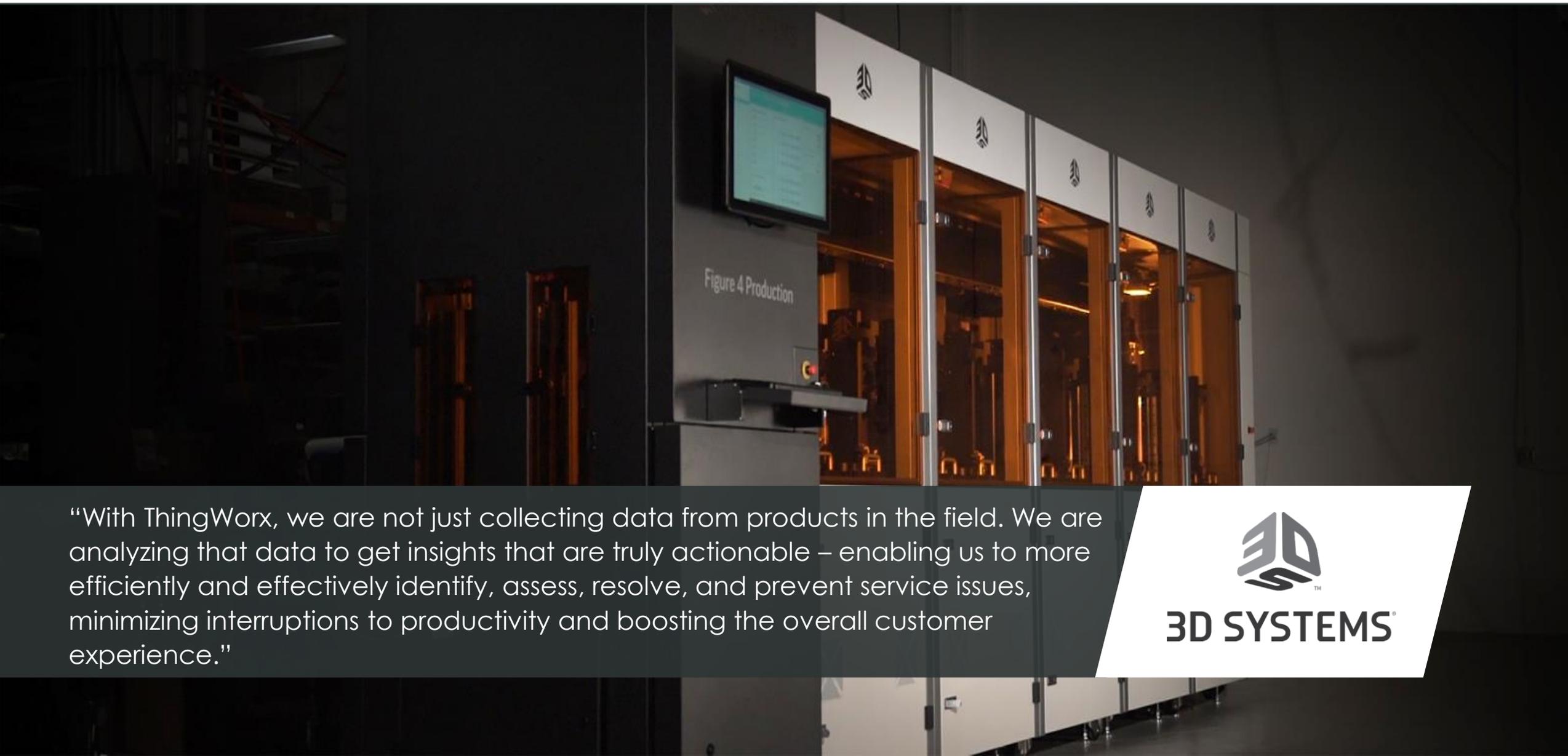
“Our IoT and analytics strategy is transforming the way we provide day-to-day support for our customers. We create a better experience for our customers while gaining efficiencies for our service team. Hands down, ThingWorx is one of the greatest investments we have made to create more value for our customers.”

Parata[®]
Parata Puts You Out in Front.™

BENEFITS TO ALL ENTERPRISE FUNCTIONS



CONNECTED SERVICES FOR 3D PRINTING

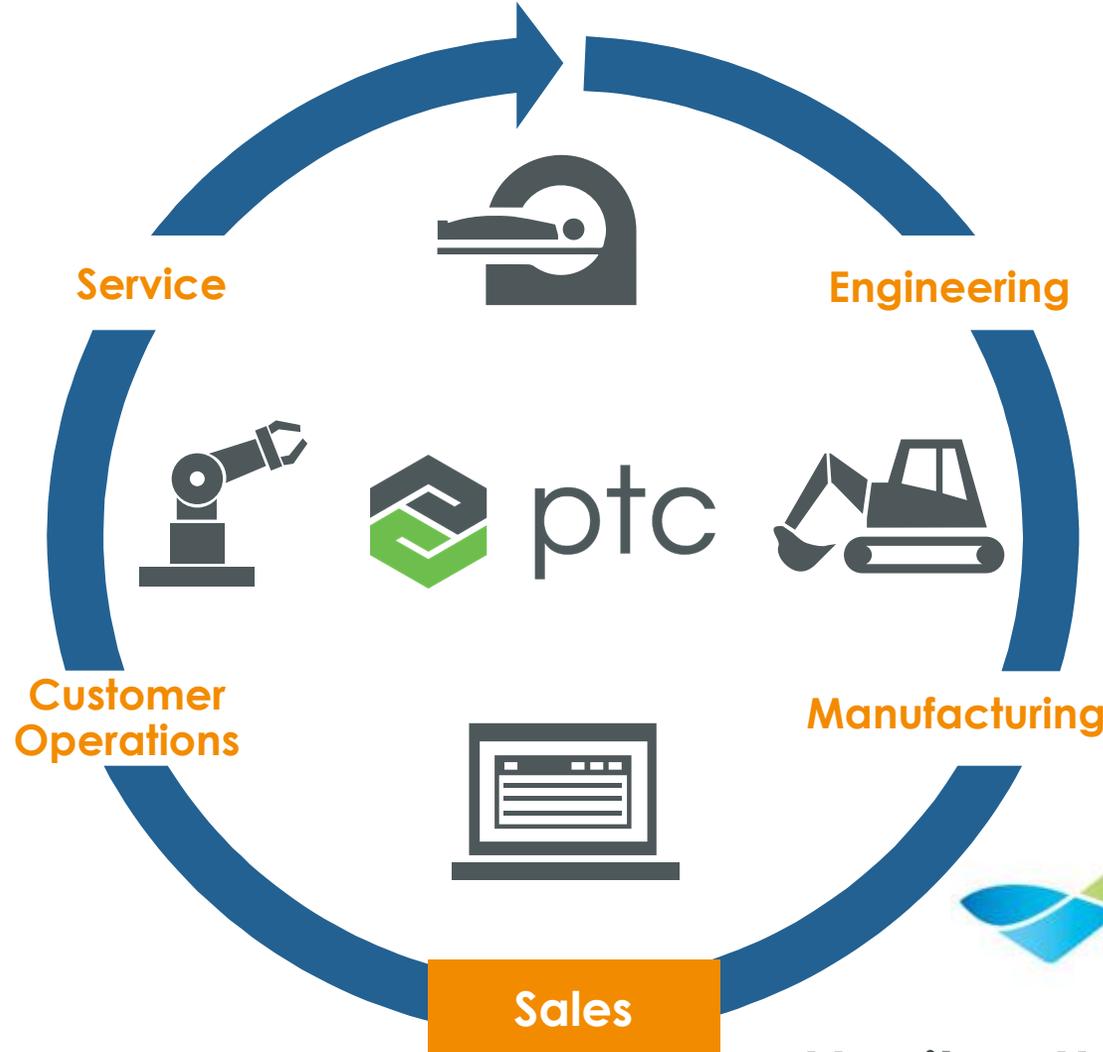


“With ThingWorx, we are not just collecting data from products in the field. We are analyzing that data to get insights that are truly actionable – enabling us to more efficiently and effectively identify, assess, resolve, and prevent service issues, minimizing interruptions to productivity and boosting the overall customer experience.”



3D SYSTEMS®

BENEFITS TO ALL ENTERPRISE FUNCTIONS



Monitors Usage to Create Up-Sell and Cross-Sell Opportunities

ACHIEVING CONNECTED PRODUCT MATURITY



“ThingWorx is at the core of our connected products strategy and remote service offering. We have discovered how to expand the value from instrument data throughout the business, transforming the way we work. ThingWorx data is integrated into every aspect of our business, from implementing process efficiencies to building value-add solutions for customers.”



ALIGNED APPROACHES TO MEETING MARKET NEEDS



ENHANCE DIGITAL
FACTORIES



MONETIZE CONNECTED
PRODUCTS



CREATE INTELLIGENT
VALUE CHAINS

ALIGNED APPROACHES TO MEETING MARKET NEEDS



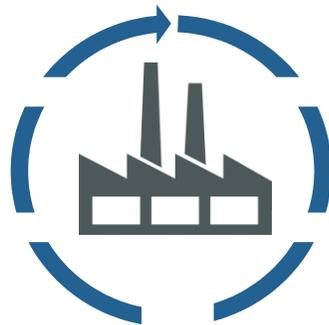
ENHANCE DIGITAL
FACTORIES



MONETIZE CONNECTED
PRODUCTS



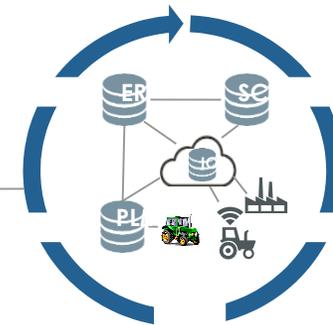
CREATE INTELLIGENT
VALUE CHAINS



Smart
Connected
Operations

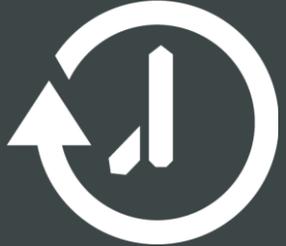


Smart
Connected
Products



Smart
Connected
Systems

COMPLETENESS OF THE JOINT SOLUTIONS

			
Deep Industrial Domain Expertise	Jointly Developed Architecture & Solutions	Widest Use Case Coverage	IoT Solutions to expedite time to value

Joint Architecture designed to provide Enterprise customers **ready solutions** meeting the challenges facing manufacturers.

DIGITAL TRANSFORMATION



Leveraging the product as the “Voice of the Customer”

COLFAX





Leveraging the product as the “Voice of the Customer”

COLFAX



Leveraging the product as the “Voice of the Customer”

COLFAX





Leveraging the product as the “Voice of the Customer”

COLFAX

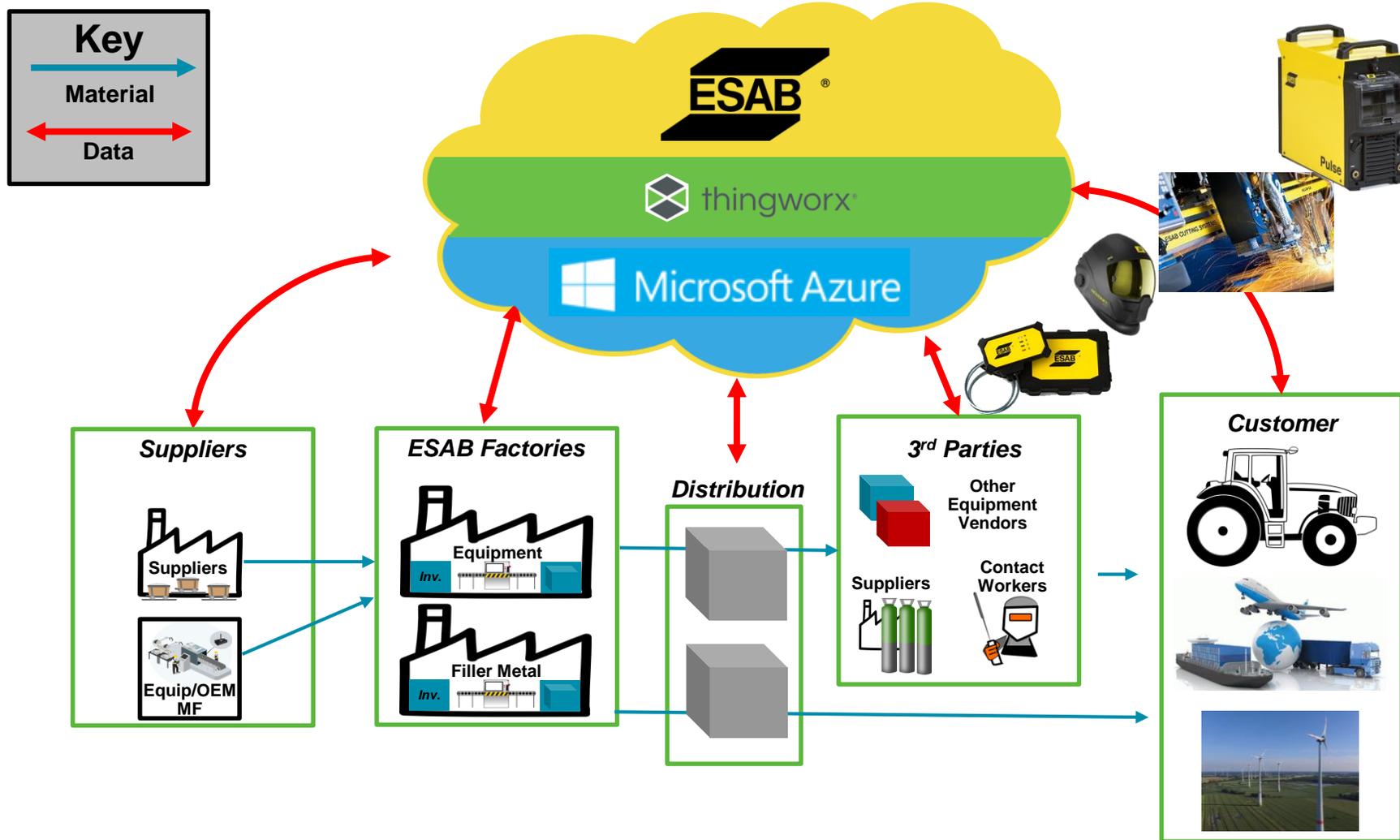


The screenshot shows the Howden website's digital solutions page. The browser address bar displays 'https://www.howden.com/en-gb/digital-solutions'. The navigation menu includes 'Products & Services', 'Industries', 'About', 'Investors', 'Resources', 'Events', and a 'Contact us' button. The page features four main content blocks, each with an image, a title, a description, and a 'Read more' link.

- OPTIME**: Smart connectivity for optimising performance and providing a unique foundation for maintaining and enhancing operational excellence. Includes a 'Read more' link.
- VentSim DESIGN**: VentSim DESIGN version 5 now includes our fan selection tool and allows manual control of your fans, along with all the great mapping features you would expect. Includes a 'Read more' link.
- VentSim CONTROL**: A fully automated digital solution that offers smart control of your mines ventilation. Part of our Total Mine Ventilation Solution. Includes a 'Read more' link.
- Solysmart**: A fan monitoring system that will more than pay back its investment the first time it prevents an unscheduled stoppage. Includes a 'Read more' link, a 'Back to top' button, and a 'Keep in touch' button.

What's Next?

The Smart Connected Value Chain





Purpose-Built for
Industrial
Innovation



Wrap & Extend
Existing Technology

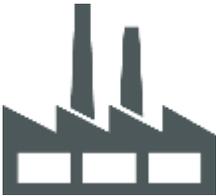


Agile &
Flexible



Engage &
experience

PURPOSE-BUILT FOR INDUSTRIAL INNOVATION



BROAD CONNECTIVITY	DOMAIN EXPERTISE	CUSTOMER FOCUS
<p>Easily connects to millions of assets (including brownfield and greenfield)</p>	<p>History with CAD and PLM gives PTC unmatched insight into the design, manufacture, operation and service of things</p>	<p>With implementations in over 75,000 sites, we have developed solutions based on customers' needs for simplicity, power and flexibility</p>

WRAP AND EXTEND WITH EXISTING TECHNOLOGY



MAXIMIZE EXISTING STANDARDS

Seamlessly ingest rich data from other applications, enterprise systems and cloud technologies

FUTURE PROOF SOLUTIONS

Enable solutions for rich experiences via Augmented Reality/Mixed Reality

EXPANSIVE ECOSYSTEM AND MARKETPLACE

Pre-configured tools and technologies to expedite your time to value



RAPID APPLICATION DEVELOPMENT

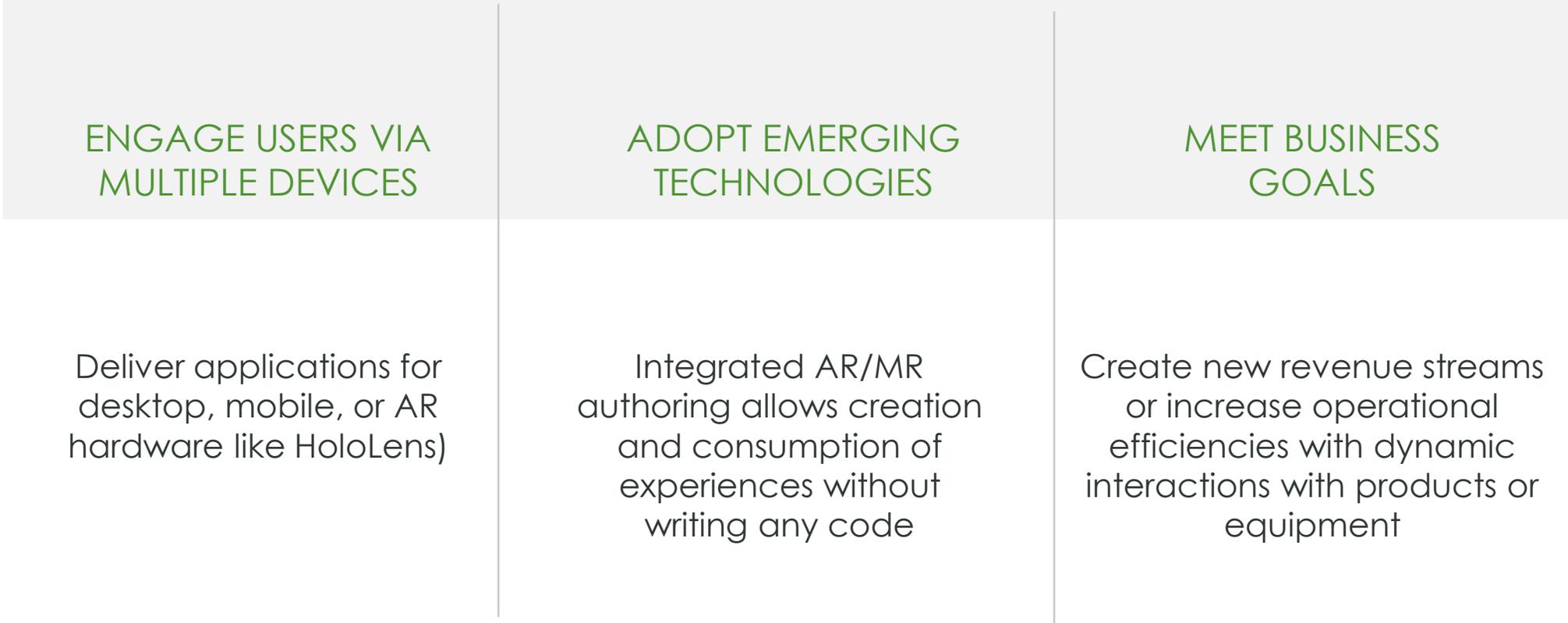
With drag-and drop functionality and intuitive tools, customers can expedite time to value

ENGAGE ON MULTIPLE DEVICES

Deliver applications in the best format for end users (on desktop, mobile, or AR hardware like HoloLens)

MULTIPLE DEPLOYMENT OPTIONS

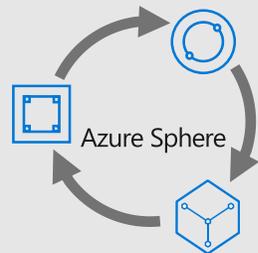
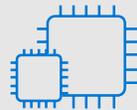
ThingWorx can be deployed in the Cloud, on-premise or hybrid providing ultimate flexibility for customers



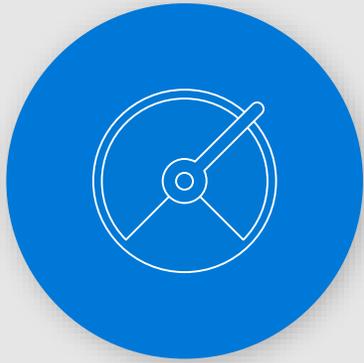
Transform your business with Microsoft



Azure IoT solutions and services



Azure IoT Edge



Productive



Hybrid

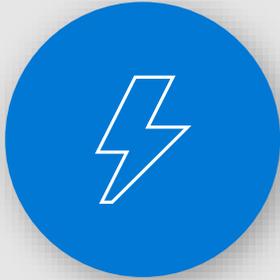


Intelligent



Trusted

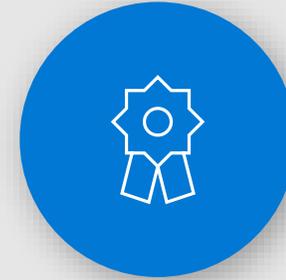
Microsoft and PTC: IoT for every business



Accelerate
your IoT
journey



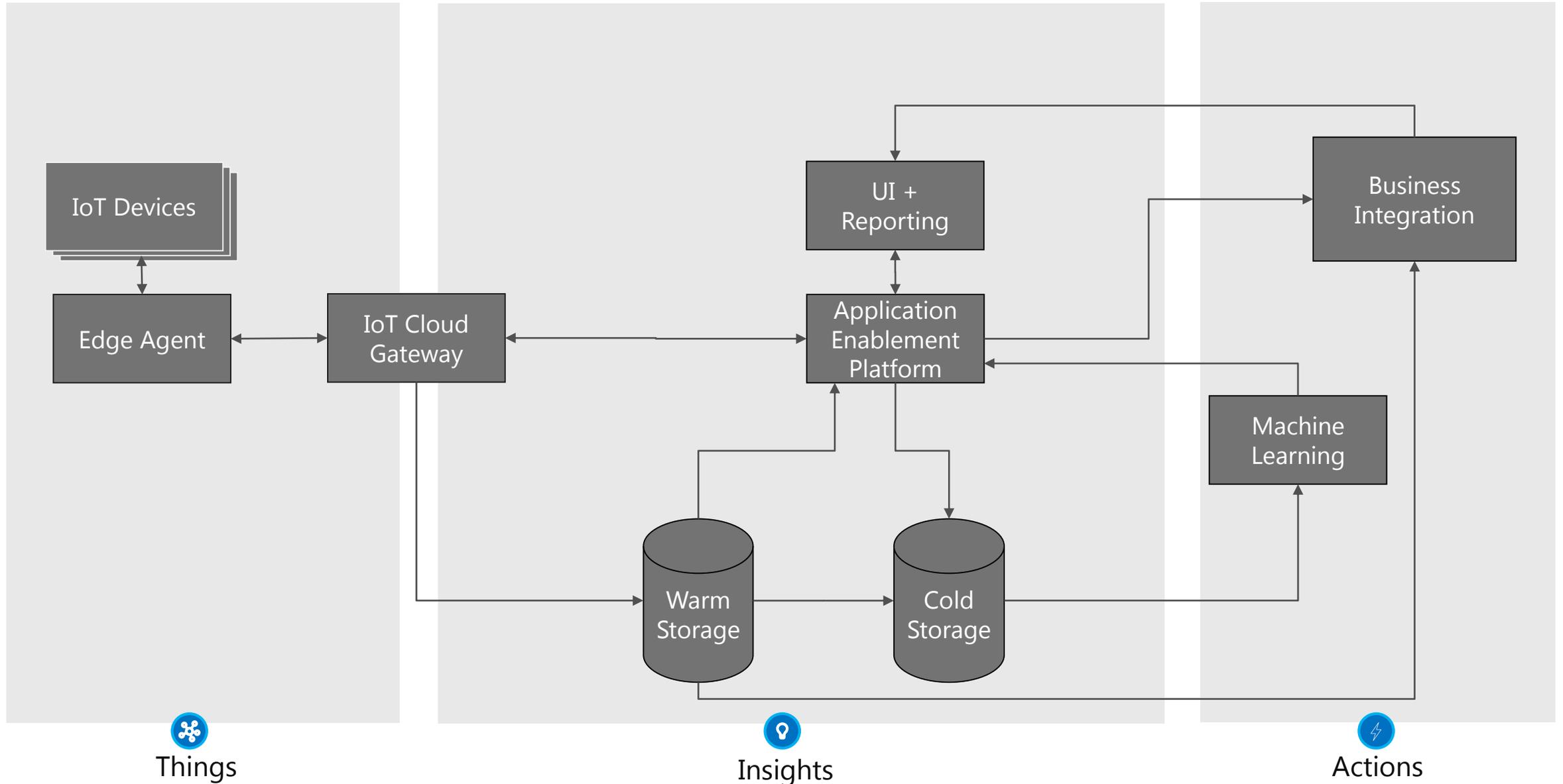
Build on the most
comprehensive
IoT portfolio &
ecosystem



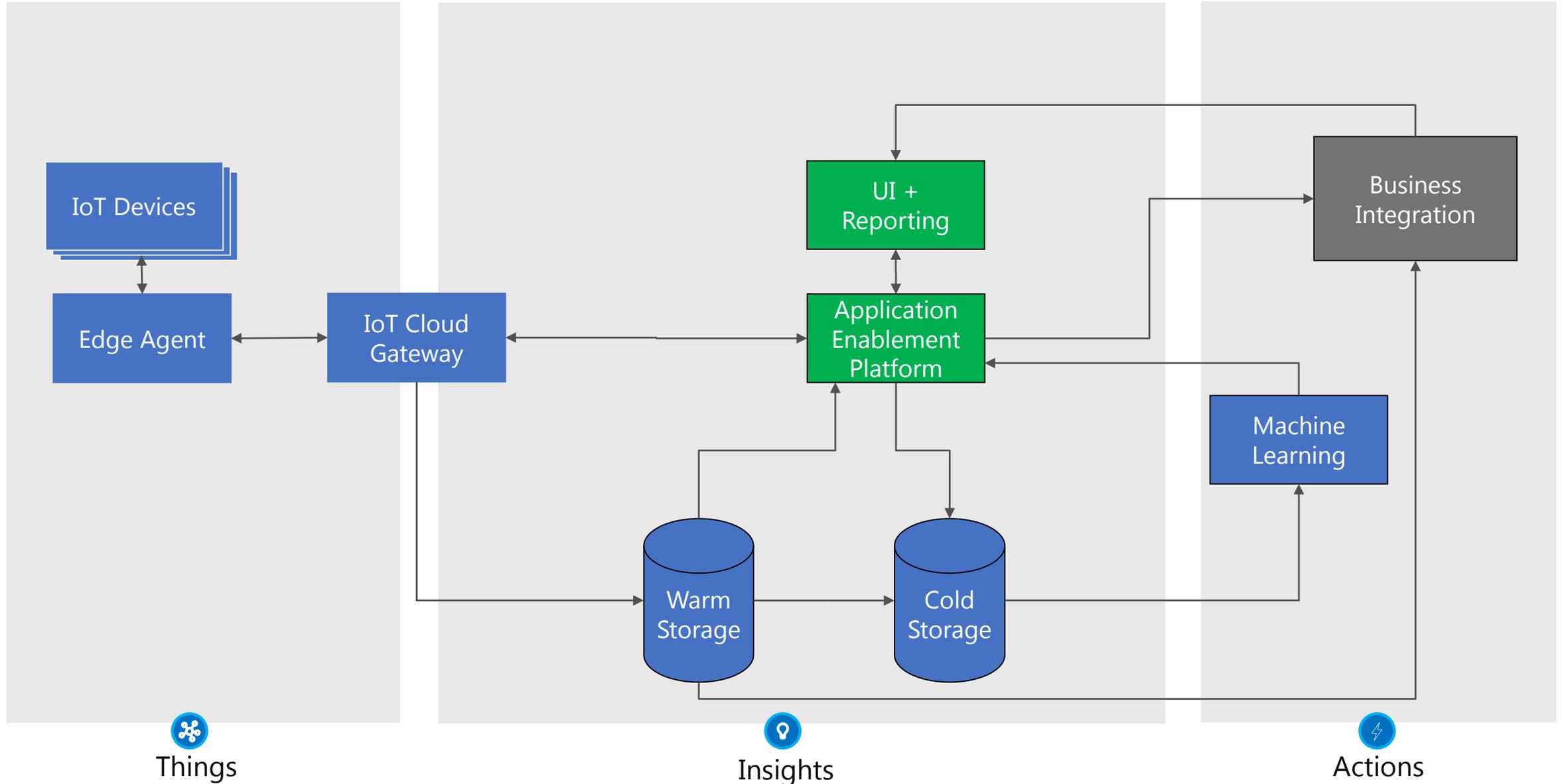
Work with a
trusted IoT
leader



SCP Reference Architecture



SCP Reference Architecture

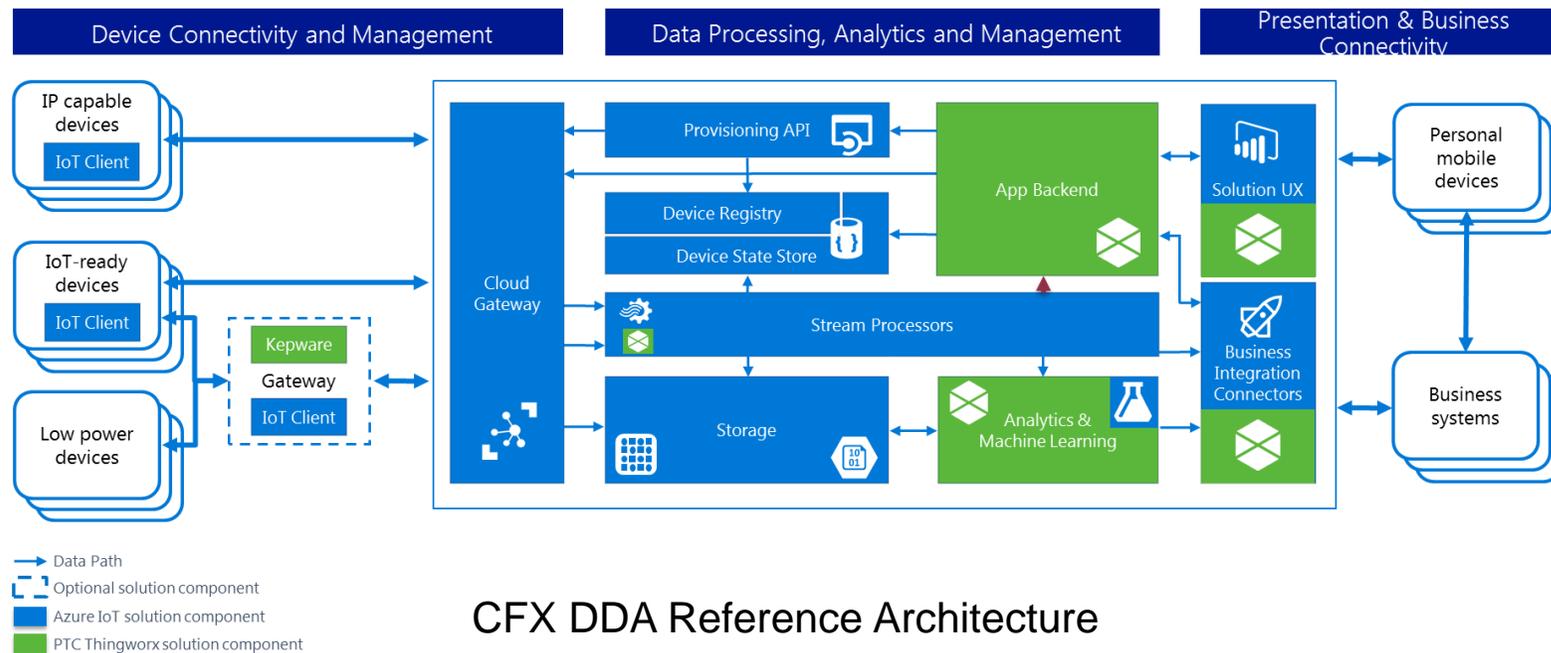


SCP Reference Architecture Components

Component	Role	Critical Capabilities
IoT Devices	OEM Customer's Product	Communicate operational status via on-board capability or via tethered hardware device
IoT Edge Gateway	Broker secure communication to the cloud gateway	Secure operating system, authorization and authentication, resilient messaging
IoT Cloud Gateway	Broker secure communication to the edge gateway	Global scalability and availability, Secure operating system, authorization and authentication, resilient messaging
Stream Processing	Apply data transformation, normalization, aggregation, and rules processing	Declarative expression of data processing rules, execution of business logic and triggering of advanced analytics e.g. ML
ML Scoring	Apply pre-built ML models to real time data streams for predictive scoring	Efficient and lightweight execution of pre-built ML models
ML Training	Train and refine ML models which are then deployed for operational scoring	Training, validation, and refinement of predictive ML models
Warm Path Store	Store recent machine and relevant contextual data (often time series) for ready querying from applications	Optimized for time series, graph, and document storage and speedy retrieval for interactive applications
Cold Path Store	Archive machine data for compliance and longitudinal analysis	Long term, economical, scalable data storage with geo-replication and hooks for analytics tools and ETL
Application Enablement Platform	Digital Twin modeling environment with Citizen-developer oriented tools for customization of business logic, workflows, app construction	Visual environment for assertion of a Thing Model with connections to machine data, contextual data, and encapsulation of business logic and analytics (Digital Twin)
Solutions, UI, & Reporting	Pre-built applications for common use cases, reporting tools for customer-specific data visualizations and analysis	Purpose built for intended IIoT use cases in SCP, flexible self-service reporting and visual analysis tools
Integration and Orchestration	Connect to and orchestrate business workflows with related enterprise systems	Comprehensive coverage of common business systems, visual workflow builder for non-developers
Enterprise Business Systems	OEM customer and OEM user's business systems	

THE PLUMBING: DDA ENABLEMENT ARCHITECTURE

- Common reference architecture allows focus on accelerating application value, not getting mired in the technology
- Same architecture for connected products, operations, and services



CFX DDA Reference Architecture

PTC AND MICROSOFT ACCELERATE DIGITAL TRANSFORMATION

Our joint solutions provide enterprise customers ready solutions to quickly meet the daunting Manufacturing Challenges of today.



ENHANCE DIGITAL FACTORIES



MONETIZE CONNECTED PRODUCTS



CREATE INTELLIGENT VALUE CHAINS

MICROSOFT



Azure IoT Hub



Azure Stream Analytics



Microsoft Dynamics 365



Azure Stream Analytics



Azure SQL



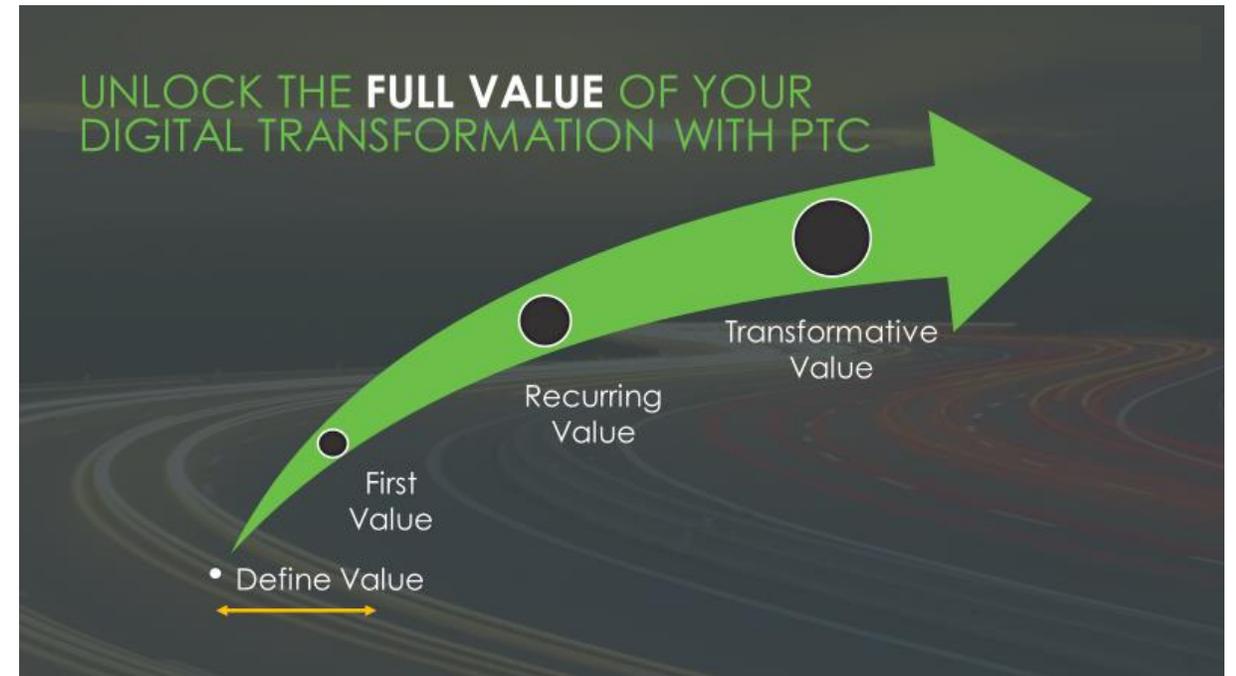
Microsoft HoloLens

PTC



NEXT STEPS

- “Digital Transformation” isn’t Someday; It’s Today
- Data from Products in the Field is Highly Valuable to All Functions of the Enterprise
- Get Started with PTC & Microsoft
 - Proven Domain Expertise
 - Technical Portfolio
 - Partner Ecosystem
 - Resources Dedicated to Customer Success





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Technologists

240+
Breakout Sessions

300+
Industry Experts

100+
Product Demos



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