



# IoT Use Cases:

Start Your Connected Journey Here.



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If you are in the business of creating, operating or servicing things you have likely seen a barrage of “billions and trillions” reports recently describing the impact of the Internet of Things (IoT) on your business.

*Cisco predicts we'll see as many as 50 billion “things” connected to the Internet by the end of this decade. That's a four-fold increase in just six years.*

*GE estimates that the Industrial Internet has the potential to add \$10 to \$15 trillion to global GDP over the next 20 years.*

*McKinsey Global Institute predicts the IoT will generate as much as \$6.2 trillion in global economic value over the next ten years. That's about ten times as much economic value as will be created by 3D printing, another transformative trend.*

At PTC, we agree the IoT opportunity is transformative. In fact, we acquired the leading IoT technologies, [ThingWorx](#), [Axeda](#) and [Coldlight](#), to deliver the world's first complete and purpose built IoT Platform. The combination delivers a disruptive suite of technology that enables companies to securely connect smart things, manage and analyze data, quickly create applications, and ultimately transform their business.

However, in order to create real business value in a smart, connected world, we need to shift our focus away from these “billions and trillions” reports and identify the specific IoT use cases that enable each organizational function to transform their business processes and improve operational effectiveness or create strategic differentiation.

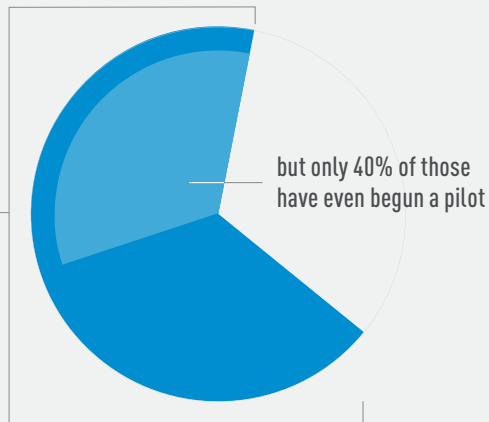
While some organizations have started to create tremendous value from the IoT, data shows that the majority of organizations are still struggling to get started. IDC research found that while 66% of Discrete Manufacturers and 67% of Process Manufacturers are actively pursuing IoT initiatives, less than half

(40%) of those Discrete Manufacturers and only about half (55%) of those Process Manufacturers have even begun a pilot. Why the delay? We have identified four challenges that slow the progress in creating and capturing IoT opportunities.

### Discrete manufacturers pursuing IoT initiatives

66%

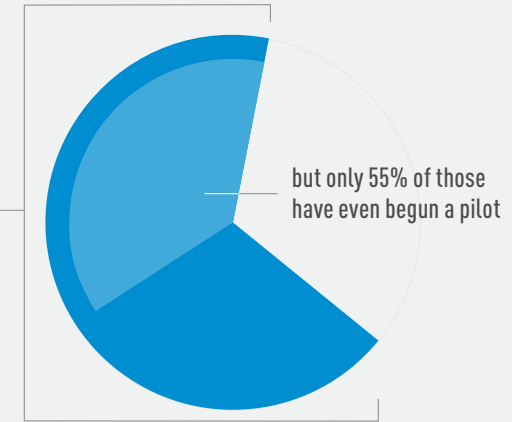
Discrete Manufacturers are actively pursuing IoT initiatives...



### Process manufacturers pursuing IoT initiatives

67%

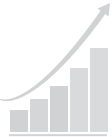





Discrete Manufacturers are actively pursuing IoT initiatives...



### Four challenges that slow IoT opportunities:

Unfunded	Technology driven	Narrowly focused	Poorly aligned
Organizations that struggle to define and prioritize IoT use cases and develop a business case to fund initial investment.	Organizations that define their strategy based on technical capabilities instead of a clear value proposition and monetization plan.	Organizations that are only exploring IoT in one business function, and have not evangelized the opportunity across the organization.	Organizations that have not linked their IoT initiatives with corporate value drivers, such as reducing costs or enabling new revenue streams.

To help overcome these challenges we have developed the IoT Value Roadmap, a guide to help organizations create business value in a smart, connected world. The IoT Value Roadmap defines the top 26 IoT use cases based on hundreds of customer interactions, and organizes them by the business function or stakeholder they benefit.

MARKETING / SALES	PRODUCT DEVELOPMENT	OPERATIONS/ MANUFACTURING	SERVICE / SUPPORT	INFORMATION / OPERATIONAL TECHNOLOGY	CUSTOMER
<p>Customer Insights and Opportunities</p> <p>Flexible Billing and Pricing Models</p> <p>New Value Added Services</p>	<p>Connected Product Usage Analysis</p> <p>Connected Product Quality Analysis</p> <p>Connected Software Management</p>	<p>Asset Material Tracking</p> <p>Connected Operations Intelligence</p> <p>Unified Key Performance Indicators</p> <p>Real-Time Asset Health Monitoring</p> <p>Operations Management Improvements</p>	<p>Monitoring and Diagnostics</p> <p>Remote Service</p> <p>Automated Service Executive</p> <p>Condition-based Predictive Maintenance</p> <p>Connected Service Parts Planning</p> <p>Warranty Cost Management</p>	<p>Flexible Product and Asset Connectivity</p> <p>Identity and Security Management</p> <p>Scalable IoT Operations Management</p> <p>Seamless IoT Data Integration</p> <p>Automated Analytics and Actions</p> <p>Rapid IoT Application Development</p>	<p>Usage and Performance Dashboard</p> <p>Customer Self-Service</p> <p>Product Personalization</p>
					

## IoT USE CASES FOR MARKETING / SALES

As a marketing and sales leader, you are driven to anticipate customer needs, efficiently identify sales opportunities, then continue to expand the relationship with customers, and identify other areas to drive revenue growth for the company.

**Customer Insights and Opportunities** – Collect and analyze product usage, condition, and consumable data to anticipate customer needs, automatically trigger alerts for cross-sell and up-sell opportunities, forecast future purchases, and create new consumable resupply models.

**Flexible Billing and Pricing Models** – Integrate product usage and performance data to enable usage, performance, or outcome based pricing and subscription models that create disruptive business models, and increase value captured and market penetration opportunities.

**New Value Added Services** – Aggregate data from products across the installed base and combine it with domain expertise to provide information, advisory, and managed services that enhance your customer’s operation of the product or understanding of their business.

“  
ThingWorx’s rapid application development environment and scalable platform allow us to extend our solution and deliver new services to our customers in ways that were previously impossible.”

– Scott Johnson, CEO, All Traffic Solutions

## ALL TRAFFIC SOLUTIONS



All Traffic Solutions is the leader in radar speed displays and variable message signs designed to improve traffic safety outcomes.

With ThingWorx, All Traffic is able to rapidly develop information portals, provide more comprehensive business system integration, and offer new advanced data mining services for their customers requesting analytics for traffic safety.



*A sign of the future.™*

## IoT USE CASES FOR PRODUCT DEVELOPMENT

As an engineer or product leader with responsibility for product development, you are driven to reduce costs, accelerate product innovation, enhance product features, improve product quality and get to market faster.

**Connected Product Usage Analysis** – Analyze and benchmark product performance and usage data collected through remote connectivity with sensor-equipped products or systems to inform and improve product requirements definition, prioritization of features, options and variants, life cycle costs, and supply chain coordination and planning.

**Connected Product Quality Analysis** – Continuously analyze field data collected through remote connectivity with sensor-equipped products or systems to improve root cause analysis and corrective actions, product quality, reliability and safety, preventative maintenance, and service.

**Connected Software Management** – Remotely identify and manage the as-maintained configuration of fielded products, systems and assets; control and automate the release of software updates and security patches by securely distributing packages of software files and instructions remotely.



With ThingWorx, I am able to benefit from having features out of the box that we may not be able to develop ourselves for months or even years... The ROI is almost immediate”

– John Beane, VP Engineering ecoATM

### ecoATM



ecoATM is the first company to create an automated self-serve, kiosk system for buying back and recycling consumer electronics

ecoATM is using ThingWorx to provide them with the deployment tools they needed to keep kiosks located in retail environments up to date with the latest software updates without the need to dispatch technicians.



## IoT USE CASES FOR OPERATIONS / MANUFACTURING

As an operations or manufacturing leader, you are focused on improving worldwide performance (cost, speed, quality) and agility in a world of increasing production and operations complexity, reducing risk and ensuring compliance.

**Asset and Material Tracking** – Easily locate and monitor key assets (e.g. raw materials, final products, and containers) to optimize logistics, maintain inventory levels, prevent quality issues, and detect theft.

**Connected Operations Intelligence** – Connect disparate silos of operational data (e.g. manufacturing, supplier, and logistics) into unified, real-time visibility across heterogeneous systems, people and assets to make faster and better decisions and improve operational performance.

**Unified Key Performance Indicators** – Aggregate and contextualize data from isolated manufacturing systems and assets into actionable web and mobile applications that provide role-based views into key indicators, while also allowing drill-down into correlated data to diagnose problems more quickly and improve performance.

**Real-Time Asset Health Monitoring** – Minimize downtime and avoid potential equipment failures by enabling detailed monitoring of critical equipment condition and operating parameters to automatically trigger alerts and proactively initiate response from maintenance teams or OEM service networks when problems are detected.

**Operations Management Improvements** – Quickly improve how complex processes are monitored, managed, and optimized, and accelerate smart factory and Industry 4.0 initiatives, by extending existing equipment and ERP/MES systems with connectivity, interoperability, mobility, and crowd sourced intelligence.

### ATI Specialty Materials



ATI Specialty Materials is a world leader in the production of special alloys and steels for the aerospace, oil & gas, and medical industries.

ATI Specialty Materials selected ThingWorx as the manufacturing enterprise platform for rapidly delivering innovative applications to drive operational intelligence and decision support. ThingWorx provides a real-time layer that connects with their manufacturing, quality, maintenance, and ERP systems and allows them to rapidly create role based decision support “dashboards” and interactive applications.



## IoT USE CASES FOR SERVICE

As a service or support leader, you are challenged to optimally service products in the field and remotely, efficiently manage spare parts and warranty costs, and develop strategies to increase revenue, profitability and customer value.

**Monitoring and Diagnostics** – Interact with connected products to identify and diagnose product issues remotely to eliminate unnecessary service calls and improve first time fix rate.

**Remote Service** – Interact real-time with connected products to perform remote service activities including machine adjustments, software updates, and self-tests to avoid downtime and eliminate need for on-site service calls.

**Automated Service Execution** – Automatically trigger service events based on connected product alerts, diagnose issues, determine the best service response and dispatch technicians based on SLA entitlements and resource availability.

**Condition-based Predictive Maintenance** – Monitor connected product operating characteristics and combine with thresholds, trends, and analytics to move from reactive to proactive maintenance.

**Connected Service Parts Planning** – Leverage connected product data including configuration, utilization, and location to improve balancing of service level objectives with service parts inventory levels.

**Warranty Cost Management** – Continually monitor connected product usage to identify and prevent potential warranty compliance issues; automatically notify operator when compliance issues occur to avoid potential product failures and reduce warranty cost.

### Diebold

Diebold is a \$2.9B provider of integrated self-service delivery and security systems, including ATMs.

By utilizing ThingWorx, Diebold is able to expand the level of its service and support offerings for Automated Teller Machines to avoid trips by resolving problems remotely and improve customer satisfaction by dramatically reducing system downtime.



With the ThingWorx we can start diagnosing problems at the time of failure, and in some cases actually correct the failure without waiting for a technician to go on site, and that could be within minutes”

– Director, Service Product Management, Diebold



## IoT USE CASES FOR INFORMATION / OPERATIONAL TECHNOLOGY

As an IT leader you face increased scrutiny to deliver more business value, maintain existing infrastructure and implement bold, new projects in IoT and big data while creating opportunities to drive innovation.

**Flexible Product and Asset Connectivity** – Leverage proven connectivity services to easily and flexibly connect to any wired or wireless asset via third-party device clouds, direct network connections, open APIs or edge devices.

**Identity and Security Management** – Provide secure real-time bidirectional communication with devices and ensure compliance with policy management for access control, logging, and auditing of interactions with connected products and assets.

**Scalable IoT Operations Management** – Establish a highly scalable system for provisioning and deploying large numbers of products and assets, managing complex event processing and Big Data, and operating in an evolving and heterogeneous environment.

**Seamless IoT Data Integration** – Rapidly integrate enterprise data from business systems, time series data from connected things, and unstructured feedback from people to rapidly respond to changing business requirements and uncover actionable insights.

**Automated Analytics and Actions** – Establish rules, business logic, and algorithms that analyze and correlate unstructured, time-series, and transactional data, to optimize business processes and discover new opportunities and insights that answer key business questions.

**Rapid IoT Application Development** – Leverage an IoT platform with a model-based application development environment to reduce the time, cost, and risk required to build and maintain innovative connected applications that differentiate products and services and provide a competitive edge.

### Systemex

Systemex is a global leader in the design and development of high-quality, reliable, and innovative blood and urinalysis medical equipment.

With ThingWorx, Systemex enabled secure equipment connectivity to deliver service and support, seamless data integration with other enterprise applications, and the ability to rapidly build value-added applications. Customers now experience improved equipment uptime, response time, and labor utilization. The data Systemex is collecting, for example capturing cycle count on an instrument, informs condition based maintenance, triggers automatic consumables replenishment, tracks contract adherence, and enables new usage-based billing agreements.



ThingWorx enabled us to build our Next Generation Remote Service Application 3-5x faster than previous tools, allowing us to gain competitive advantage in the market.”

– Steve Postma, Director, Technical Service at Systemex

## IoT USE CASES FOR CUSTOMERS

The owners, operators and solution providers of increasingly complex and connected things are looking for new ways to improve operational performance and employee satisfaction, increase product uptime, and gain a better understanding of their business.

**Usage and Performance Dashboard** – Enable customer to monitor and track the usage and performance of their products or benchmark with anonymized peers to optimize the value they extract.

**Customer Self-Service** – Enable customers to quickly diagnose and resolve issues themselves by suggesting actions based on connected product data to maximize product availability.

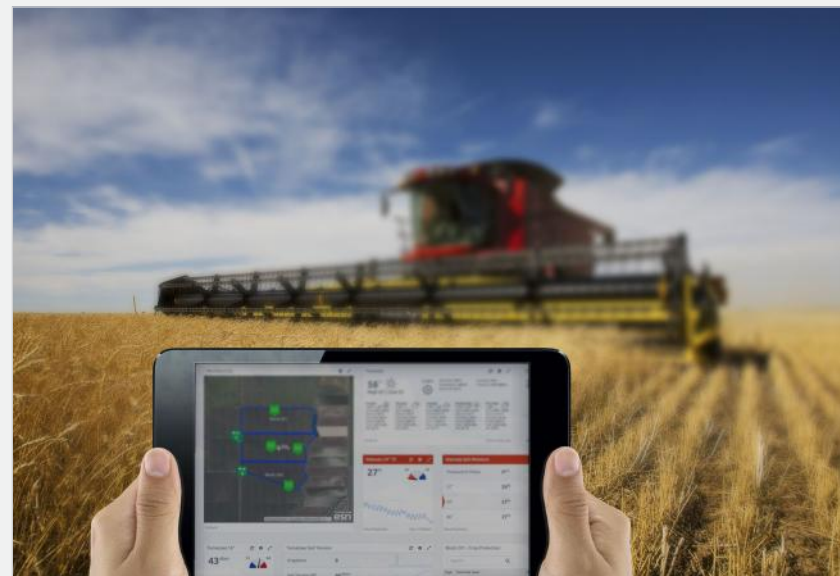
**Product Personalization** – Enable personalization capabilities by allowing users to remotely add features or change parameters to enhance their user experience and product performance.



Using ThingWorx enabled us to get to market at least a year faster with functionality that far exceeded what would have been possible. Because we choose ThingWorx, we were able to focus on developing functionality that provided significant advantages, essentially redefining the market.”

– Lance Donny, CEO, OnFarm Systems

### OnFarm



OnFarm is a highly specialized integrator of agriculture field asset and information systems for the farming industry.

OnFarm utilizes the ThingWorx technology platform to combine real-time sensor data from soil moisture, weather, pesticide usage, alerts and notices, and growing conditions from farming sites into a consolidated web-based dashboard designed specifically for growers. Growers can also take advantage of advanced imaging and GIS mapping information to spot crop issues and visualize where farming assets are located.



To accelerate your IoT strategy, start by gathering the leaders across organizational functions into an innovation workshop. Use this half-day workshop to help your leadership and management team learn about IoT concepts, review how other companies are using the IoT to create value for themselves and their customers, and brainstorm IoT opportunities that could create value across your company.

Contact [PTC](#) to request a printed copy and guided tour of the IoT Value Roadmap or to lead an [Innovation Workshop](#) at your company.

Start your connected journey here.



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