

IoT Use Cases:

Start Your Connected Journey Here.

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That's IT.

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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.

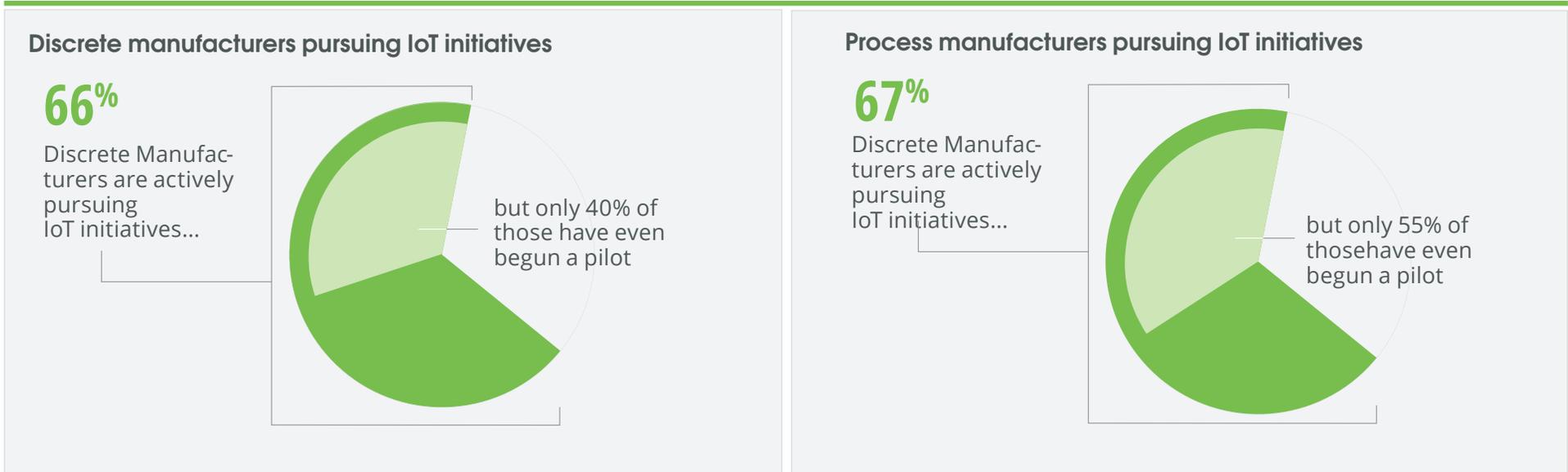
McKinsey Global Institute predicts the IoT will generate as much as \$6.2 trillion in global economic value over the next ten years. That's about ten times as much economic value as will be created by 3D printing, another transformative trend.

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.



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>Flexible Business Models</p> <p>Real-Time Market Insights</p> <p>Immersive Product Demonstration</p> <p>Connected Consumable Resupply</p>	<p>Usage-Based Requirements</p> <p>Immersive Product Review</p> <p>Connected Product Quality Analysis</p> <p>Product Configuration Management</p>	<p>Inventory and Material Tracking</p> <p>Single Screen Operator View</p> <p>Real-time Asset Monitoring</p> <p>Connected Operational Intelligence</p>	<p>Predictive Monitoring and Service</p> <p>Remote Service</p> <p>Connected Service Parts Management</p> <p>Connected Field Service</p>	<p>Product and Asset Connectivity</p> <p>Secure IoT Operations Management</p> <p>Data Integration and Analytics</p> <p>Rapid IoT and AR / VR App Development</p>	<p>Product Customization</p> <p>Usage and Performance Benchmarking</p> <p>Remote Operation</p> <p>Customer Self-Service</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.

Flexible Business Models – Deploy new business models that leverage product data to enable usage, performance, or outcome-based services and subscription pricing models that increase value captured and market penetration opportunities.

Real-Time Market Insights – Analyze usage and condition data across products and customers to trigger automated cross-sell and up-sell alerts and identify opportunities for new market segments, products, or services which align to customer needs.

Immersive Product Demonstration – Deliver interactive, at-scale, in-context product demonstrations using augmented or virtual reality to enhance customer experiences and alignment, and increase close rates. operation of the product or understanding of their business.

Connected Consumable Resupply – Connect and analyze product usage and consumable data to create inventory-based consumable resupply models which enhance the customer’s experience and create new revenue streams.

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.™



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

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.

Usage-Based Requirements – Analyze real-world product usage and condition data across products and customers with PLM, ALM, and quality systems to inform design requirements, support product portfolio optimization, and enable data-driven closed-loop lifecycle management.

Immersive Product Review – Integrate CAD, PLM, and product data into augmented or virtual reality experiences to enable enhanced design reviews for real-time cross-discipline collaboration, shortened design cycles, and reduced physical prototyping.

Connected Product Quality Analysis – Analyze real-world product usage and condition data with FMEA models and predictive analytics for automated root cause analysis, reduced warranty claims, and higher quality design.

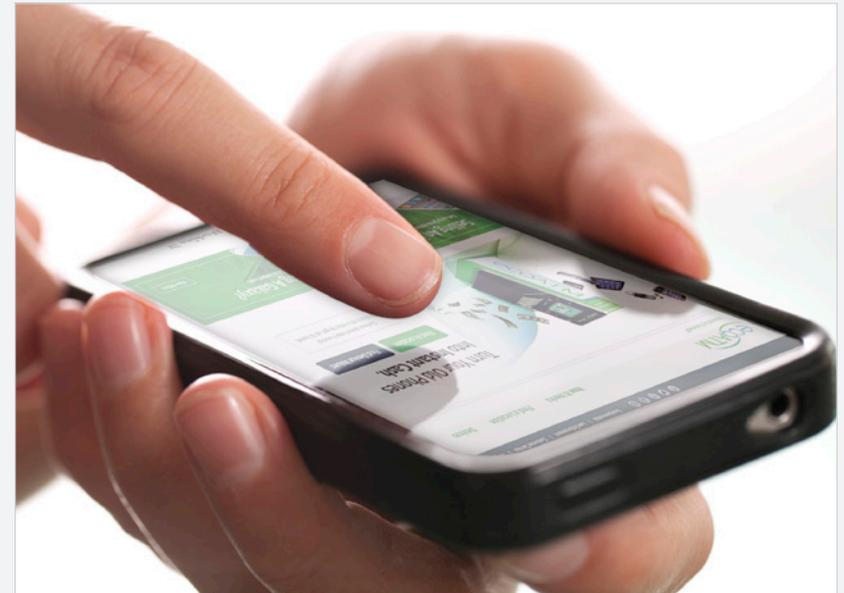
Product Configuration Management – Remotely identify and manage the as-maintained configuration of fielded products and securely distribute software updates to optimize performance, ensure compliance, and remotely deliver new product variants.



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.

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

Single Screen Operator View – Connect factory assets and ERP/MES systems to provide role-based views via augmented reality experiences or connected applications to deliver work instructions and quality capture in-context for increased operator productivity and improved production quality.

Real-time Asset Monitoring – Enable real-time monitoring and predictive diagnostics of assets to automatically trigger and proactively initiate maintenance teams or service networks to minimize downtime and identify maintenance and quality problems before they occur.

Connected Operational Intelligence – Combine, analyze, and deliver insights from disparate and diverse silos of assets, operators, and enterprise systems into unified real-time visibility of KPIs for increased operational performance and improved decision making.

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 / Support

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.

Predictive Monitoring and Service – Monitor connected products and assets for threshold anomalies with predictive analytics and provide real-time alerts to move from reactive to condition-based maintenance and increase service levels.

Remote Service – Expand real-time product and asset monitoring with embedded diagnostics to enable remote access and service including bi-directional file transfer to increase product and asset uptime and reduce on-site service calls.

Connected Service Parts Management – Collect and analyze configuration, usage, and location data from connected products and assets to increase parts inventory forecast accuracy, enable proactive demand forecasting, and optimize inventory levels.

Connected Field Service – Combine real-time and historical asset data to deliver contextual work instructions via augmented reality experiences or connected applications for increased technician efficiency and first-time-fix rate.

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.

Product and Asset Connectivity – Leverage pre-authored device drivers or agent technology and connectivity services to easily and flexibly connect and manage diverse endpoints via third-party device clouds, direct network connections, and open APIs.

Secure IoT Operations Management – Establish a scalable system to provision and deploy assets, secure and manage endpoint access, and manage system processing and analytics to operate with agility in an evolving environment.

Data Integration and Analytics – Integrate real-time usage and condition data with business system data and anomaly detection analytics to predict issues, optimize business processes, and discover new insights that deliver unique business value.

Rapid IoT and AR / VR App Development – Develop, distribute, and manage IoT and AR/VR applications with off-the-shelf extensions and a collaborative developer ecosystem for rapid solution development, high code reuse, and continuous change and process improvement.

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.

Product Customization – Empower customers to remotely add or remove features, integrate with other applications, or change operating parameters to enhance their experience and product performance.

Usage and Performance Benchmarking – Enable customers to monitor and analyze the usage and condition of their products or benchmark with anonymized peers to uncover opportunities for improvement and improve utilization rates.

Remote Operation – Enable customers to remotely control and optimize their products and assets to reduce operational costs, mitigate safety risks, improve business processes, and increase employee and customer satisfaction.

Customer Self-Service – Enable customers to quickly diagnose and resolve issues themselves via augmented reality experiences or connected applications to maximize product availability and uptime and improve customer satisfaction.

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.



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.”

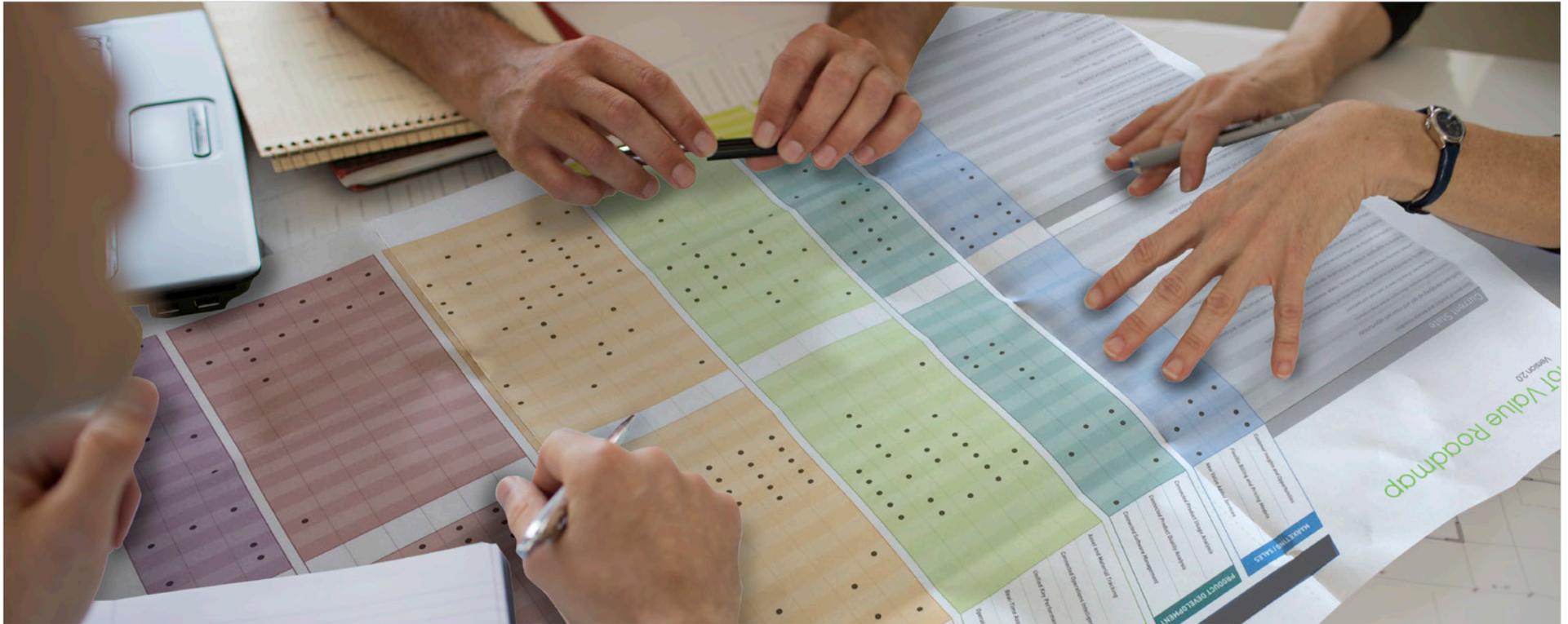
– Lance Donny, CEO, OnFarm Systems

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.

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