



Stepping into the Digital Future with IoT

How 14 companies across industries are demonstrating the reality of IoT-at-scale and generating actionable intelligence to fuel higher levels of efficiency, innovation and new business models.

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The transformation upon us: intelligent solutions are merging digital and physical worlds across industry

The Digital Age – which makes the Industrial Revolution look tame by comparison – is upon us. In this era, organizations are leveraging intelligent products and solutions to realize efficiencies, enable customization and improve the user experience like never before.

And, just as in previous transformations of industry and business, existing processes are being disrupted, innovation is accelerating, and entire industries are being reshaped.

In this new era, the integration of information technology and operating technologies is driving powerful synergies – between the physical world of smart machines, industrial operations and facilities/spaces, and the digital world of Internet of Things (IoT) platforms, applications and insights.

This creates the opportunity to help businesses generate greater efficiency, enhance safety, improve customer experience and develop new business models and revenue streams.

Building end-to-end systems and capabilities is critical to leading in this era – helping to understand and predict equipment performance, get visibility into operations, monitor facilities/spaces and make critical business decisions based on real-time, contextual data.

To succeed, organizations must have a strategy that addresses the four dimensions outlined by the World Economic Forum for this nascent Digital Age: customer expectation, product enhancement, collaborative innovation and organizational forms.

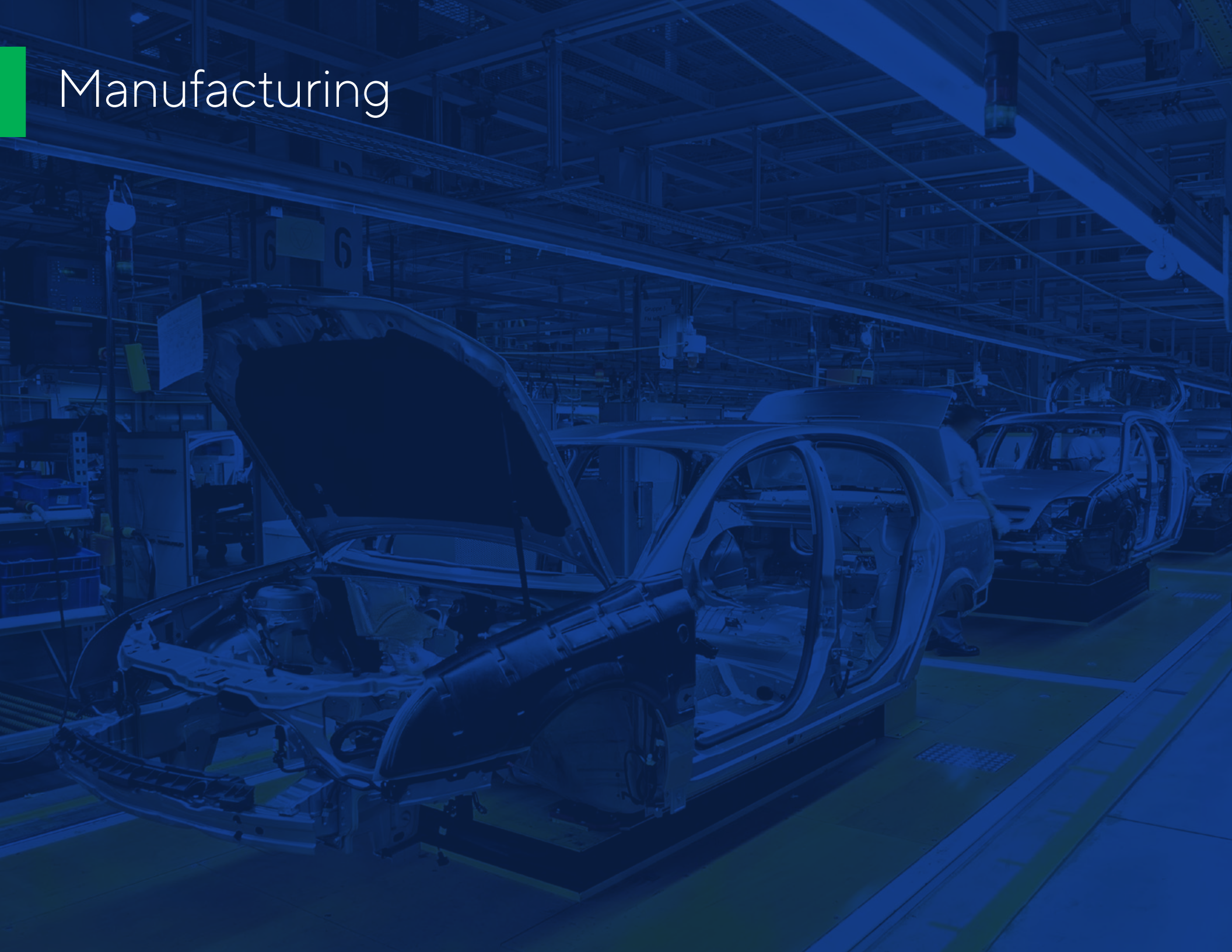
In the following pages, we present examples of businesses across industries that we've helped navigate this epochal shift by examining their challenges, developing strategies, applying design thinking and leveraging our deep domain expertise and analytics. By doing so, we've helped them contextualize, imagine and create smart, connected products and solutions that can help them drive future growth.



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Manufacturing





Digital oil field connects the drill bit to the chairman's office

The Challenge

Across the globe, oil rigs are equipped with submersible pumps lifting oil to the surface to fuel our world. To operate effectively and without fault, these pumps require periodic adjusting based on factors like pressure, temperature and oil prices. Doing so often means a costly trip for an engineer to a remote and possibly dangerous location.

One leading oilfield services provider wanted to eliminate these trips and lower costs and downtime by analyzing and optimizing the functionality of these pumps. The company partnered with us to connect its oil equipment and transform its operations into a remote service model.

The Solution

Our comprehensive analysis led us to develop an IoT approach that enables the gathering of pump information via sensors, analyzes the data to determine what changes



should be made, and programs those changes over the network to remotely update the pumps.

We helped the company enable recalibration from the safety of the office, as well as real-time awareness

of conditions that could signal an impending issue. Predictive maintenance, ongoing pump tuning and real-time information set the stage for the company to maximize oil production no matter the current market conditions.

Our Approach

With the success of connected oil pumps, we are helping the oil provider move forward with its vision of a digital oilfield, bringing oil tankers, trucks, pipeline and other equipment online, enabling actionable intelligence and an optimized supply chain.

Results

- | Decreased travel and enabled faster, cheaper recalibration of pumps in a remote setting.
- | Enabled cost savings amounting to hundreds of thousands of dollars per day through proactive alerts that help engineers prevent equipment failures.
- | Increased response time and minimized downtime.
- | Enabled continuous optimization of production based on market factors.



Connected car to personalized services

The Challenge

A large North American OEM wanted to create a global platform to deliver new connected car applications and services to existing and new markets. It is also wanted to develop a connected services program that would create opportunities for new service revenue as well as leverage captured telematics data of cars and drivers to improve product quality and services.

The company had few in-house resources with the required expertise to fully design and deploy an end-to-end solution and ensure program design success in North America, India, China and Europe.

The Solution

We brought together a blended team with expertise across IoT, machine connectivity, telematics, analytics and automotive industry



knowledge to build a proof of concept and end-to-end roadmap design of a connected car platform.

Roadmap implementation required resources for project management, requirements design,

architecture design, analytics strategy, development integration development, performance and integration testing and infrastructure services to support 50-plus locations across the U.S., China and India.

Our Approach

With the help of digital technologies, a blended team of expert resources and an ecosystem of partners, the automotive giant’s next move will be greater personalization and the ability to impact urban mobility.

Results

- | Scaling of the connected car program to five million cars by 2018.
- | Unified 25+ vehicle data sources on one platform.
- | Ability to rapidly scale program delivery across multiple countries and new technologies.
- | Ensured fast go-to-market timelines for releases.
- | Localized development, testing for specific geography releases.



Manufacturer unifies its connected equipment solution

The Challenge

The drawback to being an early adopter is that your mistakes are the ones that benefit others. A manufacturer of heavy equipment had been using telemetry data for over 15 years to enable fleet and equipment management, but the solutions were disjointed. Although each unit could meet its own needs, the company sought a more holistic approach.

The manufacturer recognized that a new look at telemetry would allow it to leverage data across units in order to adopt enterprise-wide analytics and monetize the information. It partnered with us to lead this change.

The Solution

We are leading a transformation initiative for the manufacturer, leveraging Microsoft Azure, remote configuration, predictive analytics and data monetization at scale.



The new IoT platform will manage all data across the company with one enterprise-wide data warehouse. This single source of data will enable the

manufacturer to develop advanced analytics, and make data accessible to other applications when needed through an API layer.

Our Approach

With a single cohesive IoT platform, the manufacturer will improve its ability to optimize the opportunities of telemetry data. Through a more cohesive and accessible set of enterprise-wide data, the company can provide better solutions, drive innovation internally and with partners, and scale faster and more sustainably.

Results

- | Improve scale and support of two million pieces of connected equipment, up from 300,000.
- | Enable a development operations and governance paradigm to support the new IoT-enabled business.
- | Drive new revenue channels and growth with data-based offerings.
- | Scale data collected in the field from 15 gigabytes to 6,000 terabytes per day.
- | Consolidate data and processes to drive consistency and innovation.
- | Increase the accessibility of equipment and job data from weeks to hours to enable discernable insights into performance and productivity.



Knowledge is power with adoption of smart processes

The Challenge

The massive adoption of digital is pushing companies to reimagine how they do business. One large U.S. manufacturer of packaging solutions saw great opportunity in adopting knowledge-based services: to become more service-oriented in its offerings, and grow beyond products.

As competitors had begun to leverage knowledge-based services, the company sought to develop an approach to create and support such capabilities, and engaged us to help it build the process.

The Solution

Through a comprehensive analysis, we helped develop a strategic roadmap for setting up a sensing and analytics IoT center of excellence. By leveraging our leadership, the company ensured the use of the right technology and business planning resources to support the new approach and forthcoming service offerings.



We leveraged our asset performance excellence (APEX) offering as a solution accelerator in order to build pilot solutions that gather data and provide insights that enable the

company to understand equipment performance. The monetized data emanating from the equipment and the environment also fueled the creation of new services.

Our Approach

With APEX, we are helping to provide data and insights that enable the company to understand equipment performance, drive cost efficiencies and make informed decisions about production equipment. Access to this real-time insight into asset and equipment status is also something the company can provide to its customers as a service offering. Leveraging knowledge and information enables optimized processes based on asset conditions, and proactive identification and prevention of service bottlenecks.

Results

- | Optimized consumable utilization and replenishment by 9%.
- | Increased service parts revenue by 12%.
- | Improved cost competitiveness.
- | Enabled 12% savings in inventory carrying cost.
- | Realized 5% savings from product obsolescence costs.
- | Scaled eight pilot sites with 100 assets each, 200-plus concurrent users and 10,000 connected machines.
- | Customer onboarding cut from two months to one week.



Eliminating shop floor production waste with track and trace

The Challenge

A growing number of manufacturers are in search of modern track-and-trace solutions that can help pinpoint and resolve issues on the shop floor to keep production moving forward at a steady, reliable rate.

A global heavy equipment manufacturer that was pressured to reduce costs, improve quality and decrease demand uncertainty with custom orders wanted to address these problems on the factory floor in real-time. To drive efficiencies, managers needed to gain more visibility into the movement of chassis, parts and operators. Track-and-trace capabilities could also help them visualize all aspects of custom order production and eliminate unnecessary downtime.

The Solution

We worked with the manufacturer to define and architect a sensing and analytics solution to track and trace the custom order production line end-to-end. We deployed third-party RFID and beacon technologies leveraging Intel's Retail Sensor



Platform and integrated these with Microsoft's Azure IoT platform to track, trace and alert when problems arise in real-time.

The solution provided management with real-time tracking of operator productivity using beacons; traceability of custom equipment as it moves through the assembly using

RFID tags; reporting and compliance with automated computations of employee-to-station cycle time; trend analysis by workstation and employee; and the ability to track parts location on the shop floor as the custom equipment moves across workstations.

Our Approach

With proper systems deployed, workers were prepared, parts were in place, delays were minimized, and overall factory output increased. Management can visualize all aspects of production and address problems in real-time.

Results

- | Reduced production time by nearly 50%, from 40 minutes to 20 minutes per machine.
- | Increased assembly line process compliance and efficiency.
- | Enabled management with real-time views into line delays and activities performed at each workstation.

Travel and Hospitality





Saving millions, one fuel tank at a time

The Challenge

For an equipment rental company, missing a quarter tank of gas here or there may not seem like a big deal. But spread that over 33,000 pieces of equipment in the field throughout a year's timeframe, and it equates to millions of dollars.

This issue was just one of a number of areas where a heavy equipment rental agency saw opportunity for process optimization. The company had been using sensors and IoT capabilities for various purposes over the years, but asked us for help combining its sensor equipment with contemporary techniques and technology to address numerous issues with equipment tracking and optimizing operations.

The Solution

We focused on re-architecting and enhancing the rental company's IoT and logistics applications. Using telematics data, we are enabling new capabilities in managing equipment availability and utilization tracking.



This includes real-time monitoring of equipment asset status, indicating inefficiencies like idling, underutilization and misuse.

We are also developing mobile services to replace paper ones, like accurately capturing fuel and damage charges at equipment

check-in. To drive customer satisfaction, we're incorporating additional features, such as electronic signatures and automated SMS alerts for estimated equipment arrival time, which includes a link to a sensor-powered location map.

Our Approach

Mobile-based services will provide several benefits, including improved equipment location tracking, fuel consumption monitoring, and damage assessment, resulting in millions of dollars in savings for the company. Through new customer service features based on telematics, the company is positioned in the market as an innovator that offers value-adding benefits over its competitors.

Results

- | \$10M estimated decrease in revenue leakage.
- | Support for telematics data generated by 33,000 pieces of equipment.
- | Increased efficiency through mobile job schedules for over 700 drivers.
- | Reduced time spent locating equipment by thousands of hours annually.
- | Increased market share through innovative customer-facing solutions



Connected kitchen improves morale, customer satisfaction

The Challenge

Maintaining market share in the fast food industry requires more than just providing inexpensive food on-demand. Customers expect a quality experience in addition to the low price, and one of the world's largest fast food chains wanted to improve that experience.

The food company asked us to help digitize its store operations to improve food quality and consistency, minimize consumables and reduce employee turnover.

The Solution

We introduced an IoT infrastructure to the company to improve kitchen monitoring and management. We focused on connecting the most important part of the kitchen equipment – the deep fryer – to allow the food company to monitor and analyze parameters like temperature, status, equipment fatigue and fault diagnostics.



We also implemented a new control panel to allow remote programming of recipes and rollout of new product cooking routines, in order to more

accurately control final product quality, simplify the overall process and lower employee frustration.

Our Approach

Connected fryers mean more than maintaining consistent frying temperatures. Better oversight of equipment can eliminate the sources of the biggest employee frustrations, like equipment failure and confusing product recipes. Consistent control of food preparation simplifies processes for employees, improves quality and speeds delivery to customers.

Results

- | Reduced time-to-market for new menu products.
- | Strengthened the customer experience by improving consistency and shortening wait times.
- | Reduced downtime for fryer equipment through proactive maintenance.
- | Decreased consumable utilization by minimizing fryer error in product preparation.



Healthcare and Life Sciences



Increasing adherence to a treatment routine with the push of a button

The Challenge

Living with diabetes can be a major challenge for an individual to overcome. Daily insulin injections, when needed, are especially important to maintaining quality of life for patients with diabetes. Adherence to a treatment plan prevents complications from arising.

A European life sciences company was struggling to find innovative approaches to improve treatment adherence for patients with Type I diabetes who were moving to injectable insulin for the first time. The company approached us for help.

The Solution

We identified a combination of solutions that together could encourage and track insulin treatment adherence. Through a tool called The Button, we introduced a digital tap point into the patient's home in a location where other daily routines occur. The patient taps the device after taking an insulin dose,



which helps to establish routine and build a history of behavioral data.

Combined with The Button is a sponsor network, connecting a friend or network member to the patient's progress for daily emotional support. Further, a personal counselor assignment provides a consistent

point of contact enabled by data analytics and automated daily service.

These components inject support and knowledge into a process built around encouraging treatment adherence.

Our Approach

Combining capabilities across our company — including our digital strategy, intelligent product and services, and insights, strategy and design teams — we applied human science and insights to re-imagine the customer journey for adherence. Our objective was to first gain a deep understanding of treatment adherence drivers, and then frame the study around using digital services to reinforce daily routines and support services.

Results

- | Increased patient adherence to treatment plan.
- | Optimized the traceability of products in the field.
- | Designed a 24/7 Sponsor Network for support.



Bringing medical therapy home to increase treatment accessibility

The Challenge

For most patients, at-home treatment is preferred to traveling to a clinic or hospital. When a medical device manufacturer saw an opportunity to turn one of its specialized treatment devices from a hospital-only product into a connected mobile solution, the company acted to do so. Success would reduce patient costs and lay the groundwork for real-time monitoring.

The company began developing the new device, but creation of the basic therapy consumed more time than anticipated, and it cut into the schedule for enabling connectivity. With an aggressive timeline, the company asked us for help with connectivity and the user experience.

The Solution

After collecting basic requirements on data integration and documentation, we engaged in planning and delivering a connectivity roadmap. Addressing data storage was



imperative, so we provided a product lifecycle management administrator to work on-site to manage the system of record.

We also helped address the patient experience for using the device, ensuring that patients and caregivers

could easily operate the device for home therapy and data transmission. We are now delivering on projects directly tied into connectivity, including deploying RFID for the device's rechargeable components to capture data into the supply chain system.

Our Approach

Our role in accelerating development of this new product, through IoT strategy, staff augmentation, user experience and technical expertise, will ensure this medical therapy is delivered in a timely and meaningful way, greatly benefiting the company and its patients worldwide.

Results

- | Reduced device downtime.
- | Improved patient experience.
- | Increased clinician productivity.
- | Enabled data analysis for preventive maintenance.



Device maker improves health of its health equipment

The Challenge

Waiting on a runway due to an equipment issue is one thing. Lying on a gurney in advance of a surgery is quite another.

To prevent delays due to the failure of its endo-surgical equipment, a large U.S. manufacturer routinely dispatched highly trained sales personnel to visit hospitals and examine each piece of equipment. The process was extremely costly, and led to opportunity costs as well, as the service activity meant lower sales. Further, the manual nature of maintenance meant the company could only slowly respond to failures.

The Solution

We worked with the device maker to improve its service and maintenance process. Each device already stored important data, such as surgery type, tool usage, surgery time and total lifetime usage. We helped the company create a process for capturing this data in an automated



and remote way, eliminating the need for field personnel to visit sites for simple data collection.

We also devised an IoT instrument to plug into the device maker's existing equipment, which prevented major delays in deployment and avoided

the need for recertifying devices in the field. Data about each device is transmitted automatically, enabling maintenance planning and faster remote updates. Issues are identified immediately, and downtime is reduced.

Our Approach

With the improved ability to provision software updates and enhancements, and a better understanding of device performance, the device maker can now provide more effective surgical tools and greater uptime, driving better customer service and improved patient experiences.

Results

- | Achieved ROI in less than one year.
- | Enabled \$6 million in projected savings annually.
- | Improved patient outcomes and sped deployment.



Communication and coordination at the heart of transforming patient care

The Challenge

With a shifting focus to patient outcomes, health providers are challenged to improve patient experiences. A large nonprofit health system recognized that by digitizing, it could reinvent the healthcare landscape by driving consistency, responsiveness and quality. This would greatly improve patient and provider satisfaction in a highly competitive market, in which 22 area hospitals serve fewer than two million residents.

The organization partnered with us to improve patient engagement and enable more effective communication and coordination among primary care physicians, hospital physicians and system facilities.

The Solution

After working to understand the organization's business objectives, completing interactive workshops, interviewing key stakeholders and analyzing workflows, we deployed an as-a-service, high-touch patient engagement platform. This solution



incorporates live interactions, portals and communications tools, including chat, e-mail, phone and social media feeds to create a comprehensive view of patient and care information.

Built-in analytics track performance and create real-time alerts for nurses,

such as when a prescription has not been filled, an appointment has not been made or a primary care physician has not been assigned. The platform now coordinates a large number of administration and care services.

Our Approach

Our solution aimed to transform patient communications and coordination has helped the health system continually differentiate itself with its quality of care and patient and physician experiences it delivers. The health system has moved from the 24th percentile in the Centers for Medicare and Medicaid Services' HCAHPS Patient Satisfaction Survey Top Box to the 98th percentile.

Results

- | 15% reduction in no-show appointments through improved care coordination.
- | Improved primary care physician experience, with 24x7 on-demand live clinical call support and real-time information.
- | 350% increase in incoming patient transfer volume.
- | 100% patient follow-up post discharge within 48 hours.



Retail and Consumer Goods



Keeping food fresh, and the data even fresher

The Challenge

Every year, a large retail chain attributes nearly \$2 billion in losses to food wastage. Of that, refrigeration system failures or issues account for roughly \$300 million. Alarms raised by the controllers of these refrigeration systems reach the operations team after five to six hours, and there is no mechanism to predict failures before they occur.

To compound the problem, these legacy controllers are no longer supported by the vendor, making it nearly impossible to change the alarm and logging parameters. The retailer needed new ideas to address these challenges and partnered with us to envision solutions.



The Solution

We endeavored to create an extraction utility that can directly interact with the refrigeration equipment's controllers, and retrieve a set of prioritized sensor information on a periodic basis.

Further, we are designing a platform powered by the IoT that would log, monitor and predict the alarms and failures for all U.S. stores, based on the data retrieved from the various controllers.

Our Approach

We are currently iterating on the IoT solution for the retail giant. When completed, the solution will enable the collection of data from meters, energy sources, fleets and other sources and provide an enterprise-level platform for energy, operational and supply chain excellence. Collection of this data will also open the door to algorithm development, which will serve as the foundation for prediction of failure and prevention of food loss.

Results

- | 40% reduction in food waste costs forecasted by 2019.
- | Automated 87% of work orders, reducing response times from 36 hours to less than 4 hours.
- | Drastic reduction in false alarm alerts through normalized rules engines.
- | Significant reduction of 100 million alerts per year on average through automation solutions.
- | Production-level deployment in 200 stores, with expected rollout to 5,300 stores.



Connected vending machines ensure customers can always quench their thirst

The Challenge

As soda sales wane in retail outlets, beverage distributors must find new ways to get their drinks in the hands of thirsty consumers. A major global food and beverage company saw an opportunity to improve the profitability of its vending machines, soda fountains and coolers by using the IoT.

The company asked us to help connect its equipment to avoid out-of-stock situations, prevent product theft, gain insights about buyer behavior and lower restocking costs.

The Solution

We managed a multi-vendor effort to build an equipment network leveraging connected services, and oversaw prototyping and technology selection. Our IoT solution included a big data analytics application and software to interpret sensor data in order to send alerts.



When supplies run low, software automatically orders new products, enabling unnecessary supplier visits. Alerts notify the company when sensors predict future equipment

problems, and continuously update security personnel with equipment location if moved.

Our Approach

Better intelligence about vending equipment enables the beverage company to optimize the product mix in any given location, while also minimizing product inventory outages. The equipment's sensitivity to potential malfunctions and possible theft also drives down costs, enables preventive maintenance and reduces downtime.

Results

- | Increased revenue 5% in one division.
- | Reduced supply chain costs 15% in the same division.
- | Enabled 5% savings in equipment loss due to projected theft.



Conglomerate speeds business outcomes with IoT Center of Excellence

The Challenge

Most corporations operate their business with a CEO, CFO and CIO, but you'll rarely find a Chief "Internet of Things" Officer to manage enterprise-wide transformational initiatives.

A large conglomerate had multiple "things" officers responding to their corporate digital charter to develop innovative new products for their customers. While some of these siloed IoT initiatives met with success, failures were more numerous due to lack of consistency, timeliness and cost-effectiveness, as well as paltry outcomes. The leadership team wanted to coalesce its IoT/digital programs and align IoT efforts toward a vision of long-term sustainability.

The Solution

Through a series of digital workshops, the company agreed to build a centralized services hub focused on a common mission and vision to scale IoT initiatives and drive better outcomes. The center of excellence (CoE) will hasten the development of



new IoT solutions through platform standardization, provide a secure environment, and use a flexible service model.

Using Microsoft Azure and Amazon Web Services, we are designing and building the IoT platforms that will

be used to build consumer-facing connected products solutions. We will provide services for device management, device registration, user management, security, DevOps and infrastructure integration.

Our Approach

With a centralized CoE, the conglomerate can speed its IoT initiatives, ensure tighter alignment and collaboration with the various product business units, establish project delivery discipline, achieve service excellence for customers, and leverage resource talent to sustain and grow domain experience.

Results

- | Reduce resource acquisition and retention costs.
- | Reduce the cost of tools and technologies.
- | Improve accessibility and visibility information for business.
- | Improve customer experience.
- | Improve productivity of each project delivery.
- | Reduce turnaround time for resource acquisition.

Learn More

For more information and to view our full library of client case studies, visit www.cognizant.com/iot.

About Cognizant Digital Business | Internet of Things

Cognizant Digital Business helps our clients envision and build human-centric digital solutions – fusing strategy, intelligence, experience and software to drive industry-aligned transformative growth. As emerging technologies like IoT extend across the enterprise, factories, supply chains and beyond – as well as become more pervasive throughout our everyday lives at home, school and work – clients across industries are seeking Cognizant’s expertise to advance and implement their IoT strategies. IoT, combined with applied analytics and intelligence, is helping them deliver greater business performance, products and service offerings – all leading to superior customer experiences. To learn more, please visit cognizant.com/enterprise-iot-solutions or join the conversation on [LinkedIn](#).

About Cognizant

Cognizant (Nasdaq-100: CTSI) is one of the world’s leading professional services companies, transforming clients’ business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 193 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at www.cognizant.com or follow us [@Cognizant](#).

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