Driving the Convergence of the Physical and Digital Worlds

How 14 organizations are using intelligent connectivity to boost operational efficiency, improve the customer experience and create new business models for revenue growth.

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Toward a more connected, intelligent world

It's becoming increasingly difficult to separate the physical from the digital worlds. From how consumers drive their cars, to how field engineers perform maintenance, physical tasks are now augmented with real-time digital experiences.

We're seeing this physical-digital convergence on factory floors, where 3-D printing, sensors, robotics and machine learning are increasing efficiency, reducing downtime and enabling agility. We're seeing it become more pervasive in intelligent products, where Internet of Things (IoT) platforms are enabling remote monitoring, near-real-time service and proactive field servicing. And we're seeing it in new industrial information ecosystems, in which traditional businesses have learned to monetize their IoT capabilities to offer new data-rich services.

Across industries, businesses are interested in transforming all aspects of how they run, from product development and manufacturing, to supply chain, logistics and service lifecycles. And for this, they require intelligent products, process and connections between them. As IoT connectivity extends across the enterprise and factories, many industries are seeking Cognizant's expertise to advance and implement their IoT strategies. They require help in understanding how to converge the physical world (sensors, machines, industrial processes, places and people) and the digital world (software, platforms and analytics) to create meaningful insights that can revolutionize operations and business models.

Increasingly, our clients realize the power of IoT in connecting people, places and things, and the rich insights the data from this ecosystem can provide.

In the following pages, we present examples of businesses in several industries that we've helped in their endeavor to bring together the physical and digital worlds by combining product engineering, industrial automation and IoT to deliver vertically integrated end-to-end solutions.

By doing so, we've helped them deliver tangible results, whether it's boosting operational efficiency, discovering new revenue growth opportunities or developing amazing customer experiences at scale.

Frank Antonysamy

Global Markets Head,
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Boosting Operational Efficiency

Smart glasses improve efficiency for energy company's field engineers

The Challenge

A leading clean-energy company, and one of the largest rate-regulated electric utilities in the U.S., undertook multiple digital initiatives to increase its operational efficiency. While doing so, it determined that the activities of its power distribution engineers — charged with assessing the condition of the electrical infrastructure in the field — were overly manual.

The company sought our assistance in helping to improve the productivity and efficiency of its distribution engineers. Its goal: provide engineers with a hands-free way of entering or retrieving salient maintenance information on-demand, reducing equipment downtime and costs.

The Solution

We designed, developed and implemented a proof of concept for using augmented reality (AR) smart glasses designed for the industrial industry by Daqri, an innovative wearable technology company. Daqri's glasses use sensors and cameras to gather data and overlay it onto a transparent AR display. The glasses also integrate with external devices, such as Bluetooth keyboards and GPS sensors, to provide an intelligent, efficient and productive solution.

Using AR, distribution engineers can view detailed work orders and instructions, identify locations, visually analyze a heat map and activate remote assistance. They can also launch, update and submit inspection forms using a visual interface.

Our Approach

We met with stakeholders to understand requirements, develop the solution architecture and design, and connect the user interface and API with the sandbox environment, while also providing integration, testing and support. The next step is to move forward with the pilot deployment and then full-scale production.

The Results

- Higher productivity and efficiency, as distribution engineers understand processes more quickly, spend less time on each step and make fewer errors.
- Improved monitoring and maintenance of critical electrical infrastructure, resulting in less downtime and lower costs.
- Better connection between digital data and actual physical measurements.
- Increased safety and protection of field personnel.
- Ability to support training in the field.

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Global manufacturer increases efficiency, improves decision-making with real-time data

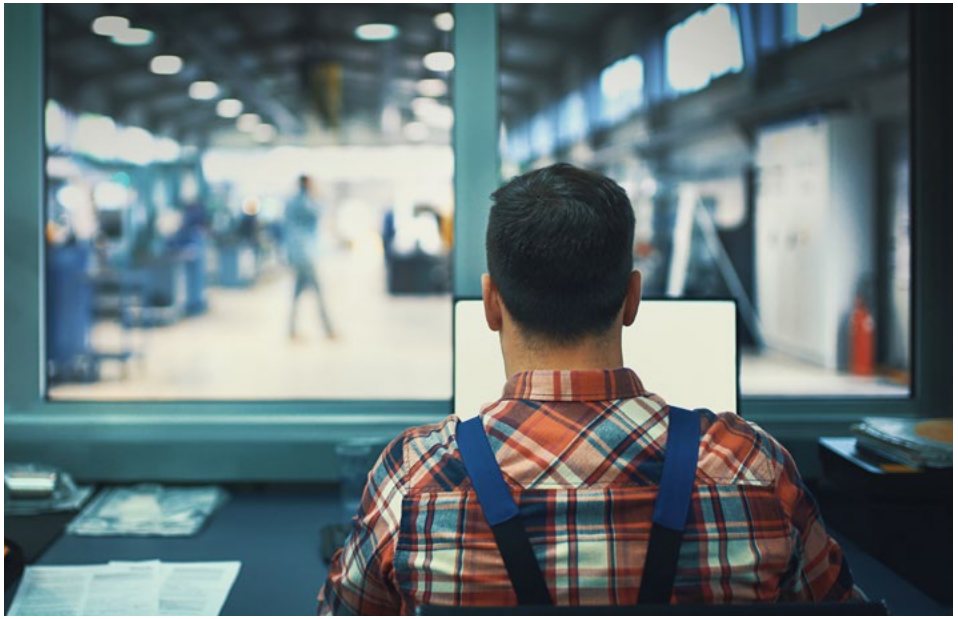
The Challenge

A top U.S. manufacturer relied on over 20 plant floor applications, each operating in its own silo, with no integration with the company's ERP. The result: a lack of real-time visibility into the supply chain, impeding the manufacturer's ability to identify and fix problems with its factory workflows.

The company knew it needed a more agile, responsive approach to boost productivity, by consolidating and aligning plant floor applications with its enterprise software. It was also looking at a multi-year migration to a new enterprise manufacturing solution — a costly and risky proposition.

The Solution

Using our Cognizant OnePlant™ blueprint, we brought digital integration to the client's dispersed factory floor. We also accelerated the ERP deployment and new manufacturing plant acquisitions to a matter of months.



We worked with the business to integrate all its applications, standardize plant operations and incorporate its supply chain into an enterprise-wide manufacturing service business. Its digital platform harmonizes plant and operations processes and improves operational agility. Integrating new products, upgrading designs or rolling out new software applications are all dramatically simplified.

By integrating operational applications with its ERP, the organization now has unprecedented access to real-time data, as well as actionable analytics and collaborative work-flows. This allows the company to predict production pain points, adapt to evolving customer needs and solve problems in real-time. Management now has end-to-end visibility into the supply chain, enabling alignment of plant systems and applications with the extended value chain.

Our Approach

Our strategy enabled the manufacturer to achieve its smart factory innovation goals faster, reducing cost and risk, and bringing its digital vision to life.

Results

- Accelerated a planned multi-year digital migration strategy to just months.
- Modernized factory floor operations.
- Increased visibility into production workflows.
- Boosted efficiency while optimizing management control and collaboration across the enterprise and through the supply chain.
- Enabled faster ERP deployment to satellite operations.

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Using data analytics, semiconductor manufacturer avoids costly breakdowns

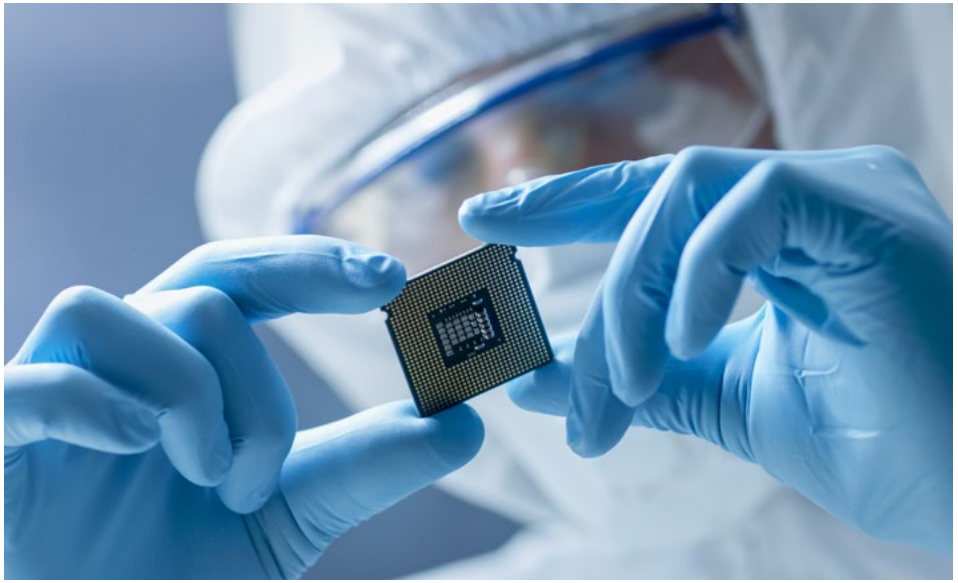
The Challenge

A semiconductor manufacturer needed to better understand and predict breakdowns in its production equipment. These machines were breaking down every 12 to 15 days, compared with what should have been one or two unscheduled downtimes per year.

While the manufacturer had no way to electronically collect data on each shutdown, it discovered that in each case, the heating filament in the machine had failed. Further testing wasn't feasible, as it would mean interrupting a production run and discarding any wafers that were in process. In addition, testing a filament was impossible without incurring delays and costs.

The Solution

We worked with the manufacturer to develop the teams, tools and skills to identify the most valuable data to better predict failures, and move toward a predictive maintenance capability.



Using a Six Sigma process improvement methodology, we correlated the causes and effects of the failures, and facilitated several sessions with production staff to gather and analyze the data in a structured way. Using this formal process, as well as our deep analytic and data management skills, the manufacturer has increased its predictive downtime accuracy rate from 65% to 87.6%. The company now uses an analytics dashboard to predict downtime without interrupting production or replacing working filaments.

We're now working with the manufacturer to further improve forecasting accuracy through the use of sensors, which will provide real-time information to warn of impending failures. With this added data, and refinement of the analytics, we hope to boost forecasting accuracy from 98% to 99%.

Our Approach

We applied a structured analytic methodology to dramatically improve the accuracy of predicted downtime. We're working with the manufacturer to perform predictive maintenance and link its maintenance and production planning processes for improved efficiency.

Results

- Reduced unscheduled downtime from every 12 to 15 days to minimal levels.
- Digitized manual, paper-based processes for collecting critical operational data.
- Increased the manufacturer's previous 65% accuracy rate for predicting downtime to 87%.

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Auto parts maker will cut costs, improve agility in its move to a smart factory model

The Challenge

In order to lower costs, comply with higher quality standards, respond to unpredictable customer demands and track components for recall processes, a global auto parts manufacturer needed access to real-time information at about every step in the production chain. However, it lacked real-time communication between its ERP systems and its operational systems.

The manufacturer wanted to pursue the Industry 4.0 model, utilizing technologies such as 3-D printing, sensors, robotics, machine learning and artificial intelligence to increase efficiency, adaptability and agility while reducing capital and operational expenditures.

The Solution

We plan to implement our Cognizant OnePlant™ framework to define a transformation roadmap, select the most appropriate systems and products, implement the solutions, ensure user adoption, and support deployment and use of the enabling platforms.

We began the project using a simulation tool to model the current and ideal production flows. Data consolidation in the manufacturing execution system (MES) will fuel analytics that can help prevent production line slowdowns, improve quality, reduce waste and reduce data management costs.

Based on findings from our pilot programs, we'll help the company choose, configure and implement an MES solution that will provide more complete visibility into all plant operations in compliance with the ISA-95 standard for automated interfaces between enterprise and control systems.

Our Approach

We designed a solution to increase the data flow between ERP systems and production systems. Using simulation tools and our Cognizant OnePlant™ framework, we helped the manufacturer understand the cause of inefficiencies, improve data flows and choose an MES to implement new production flows.

Results

- The manufacturer has begun the journey toward the Industry 4.0 vision to drive competitiveness and agility.
- Data analytics enabled by the new MES solution will streamline the production process.
- The result will be increased efficiency, lower costs and increased agility, as factory staff can devote time to quality and customer service rather than paperwork.

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With better data access, medical device maker ensures product quality

The Challenge

A global manufacturer of medical devices sought to improve its process for addressing adverse events, to comply with standards for Corrective Action and Preventive Action (CAPA) and control product quality.

The company used multiple applications for handling data on products, processes, patient treatments, outcomes and compliance. Much of its event monitoring was kept in local databases or applications, and approaches to implementing standards, processes and information management were inconsistent, increasing operational risk, cost and downtime.

The Solution

To continue delivering safe, reliable products while quickly responding to quality events, the device maker needed a strong, centralized analytical platform for decision support, along with the means of ensuring accurate data for compliance.

We developed a single data management system, with a centralized governance program, providing a single source for verifiable data. The solution allows the company to validate data, monitor data ownership and create an audit trail; quickly address adverse events; track key performance indicators; and manage user access privileges to reduce data-handling violations and risk.

The device maker now runs a single decision support and analytics system that meets its operational and compliance needs, with faster response times, more accurate data for decision-making, lower costs and increased efficiency.

The solution also provides readily available access to data and reports on quality events. Users can specify the type of report they need, display key information graphically and drill-down for further analysis.

Our Approach

Using PTC's ThingWorx® Navigate™ and Windchill® platforms, we helped the medical device maker centralize data systems, streamline information flows and reduce response times from 20 days to less than a week.

Results

A client dashboard enables the device maker to:

- Monitor device information to drive efficiency with first-time right information, for the right people, at the right time.
- Improve compliance and reduce risk events.
- Enable accurate reporting for compliance audits.
- Provide feedback to product design for improvements.

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Global health diagnostics provider ensures compliance, improves products with a connected platform

The Challenge

A global health diagnostics provider needed to ensure compliance with the U.S. Health Insurance Portability & Accountability Act (HIPAA), particularly the requirement that patient data sourced in the U.S. remains in its country of origin. With operations in more than 150 countries, the company had an existing IoT platform (based on PTC's Axeda™), and needed to ensure HIPAA compliance for connected devices that gather and store patient information.

The diagnostics provider needed to continue remote testing, monitoring and upgrades of its diagnostic devices, while protecting privileged data and using HIPAA-certified data management protocols, techniques and repositories.

The Solution

We approached this project as a classic enterprise systems integration initiative, using Amazon Web Services (AWS) as the cloud platform and applying specific protocols for which data can move across borders and how devices are protected.

We implemented a cloud-based infrastructure, installed the latest version of Axeda™ as a new instance, validated the system operation, and developed HIPAA compliance checks for the software and infrastructure combination. We then began onboarding the company's devices to the new U.S.-based cloud platform, cutting the cord with the non-U.S. database, while maintaining data gateways as necessary.

The solution not only ensures local country compliance, but it also enables data to be used to improve products and predict device needs. As a result, the company is considering how to extend its U.S.-based project to device management and compliance enterprise-wide.

Our Approach

We helped the company address data management, patient privacy and IoT device security across a global platform of diagnostic equipment, local and remote servers, and enterprise applications.

Results

- Ensured HIPAA compliance for enterprise-wide data generated by connected products.
- Established process for product data insights to improve product development and prediction of device needs.
- Optimized transition and IT costs of migration from Axeda™ to ThingWorx®.

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Streamlining information flows for biotech manufacturing

The Challenge

A global biotech company needed to streamline, simplify and rationalize its manufacturing processes worldwide, as well as consolidate the associated production data in its manufacturing execution system (MES).

The company's global biotech plants had developed their own processes for managing production data, which was tracked in platforms ranging from enterprise resource planning (ERP) software to spreadsheets. This manual, siloed information flow reduced workforce productivity and increased the risk of errors. The lack of a common, automated information flow also made it difficult to ensure compliance with proper production processes and prevent waste.

The Solution

We helped the biotech company develop consistent, automated information flows to maximize efficiency while assuring product safety, traceability and compliance in its manufacturing facilities

worldwide. We began by developing templates of suggested global manufacturing processes within the MES that will meet 80% of the requirements common across global sites and business units. This will encourage the use of best practices and reduce the need for site-specific customization.

Using these templates, as well as reusable tools for functions such as readiness assessment, data management and documentation, we will bring this automated information flow to a new plant every three months. Doing so will help all players — from plant managers to senior leaders — share information and access analytics to improve operational efficiency and productivity.

Our Approach

We implemented a single information platform to drive consistent information handling practices across the company's worldwide biotech production facilities.

Results

- 20% reduction in manual data entry and paper-based tracking.
- 10% reduction in scrap and waste.
- 15% increase in asset utilization.
- 20% improvement in product lead time.

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Global pharma moves to smart manufacturing

The Challenge

Following an acquisition, a Fortune 50 pharmaceuticals company needed to streamline its varied manufacturing processes and systems. The company wanted to replace its disparate legacy applications with a unified, flexible manufacturing system that would lower operational costs, reduce complexity and increase visibility into its plant floor systems.

The Solution

We worked with the company to unify processes and systems while improving operational efficiencies across 70 global locations. Our team conducted an initial site readiness assessment, and executed parallel implementations of the manufacturing systems and go-live and support.

Using the Cognizant OnePlant™ framework, we helped the company reduce cycle time, increase yield, introduce paperless systems and enhance compliance and quality. We also established a structured training and change management process and utilized OnePlant™ templates and assessment kits to promote adoption.

Our success at the initial plant sites enabled the company to retire several end-of-life systems. The efficient and evergreen standardized platform lowers cost of ownership for the company, which can now invest those savings in further developing the smart factory strategy and other areas critical to business. Moreover, we empowered the business to harmonize critical manufacturing processes, giving a major boost to the ongoing pursuit of excellence in operations, quality and compliance.

Our Approach

The pharmaceuticals company engaged with us to lead its smart factory transformation program. By helping to deliver consistent business processes and procedures, the company realized globally maximized specific outcomes. The solution enables collaboration of diverse stakeholders and systems across the business, as well as global deployment of processes and solution accelerators to speed implementation. It also automates process yield and compliance, and reduces cycle time.

Results

Thirty of the company's 70 sites are now live, with a unified manufacturing execution system integrated with ERP, resulting in:

- 20% increase in throughput.
- 50% decrease in batch review efforts.
- 10% decrease in inventory costs.
- 15% decrease in rework.
- Savings of over 4,000 person-hours.
- ROI realized within six months of rollout.

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Improving Customer Experience

Automaker forges better, smarter connections between drivers and cars

The Challenge

A global automotive manufacturer wanted to enhance the car ownership experience by giving drivers more useful and natural ways to interact with their vehicles. The two focal points included a mobile app for its electric vehicles and remote vehicle communication for its luxury cars through Amazon Alexa.

The company recognized the merits of combining cloud and mobile technologies but lacked the resources and expertise to develop the applications.

The Solution

Our objectives were to enhance vehicle safety and security through the mobile app and expand the range and capability of the app's features. The project included native development of middleware for Android and Apple wearable products, coding for the mobile application in Java using Swift, and development of the vehicle server software.

The principal enhancement was to add remote control and monitoring features, such as route planning, range and electricity consumption, and notifications of necessary maintenance. Drivers can also remotely check battery charge levels, receive notifications when charging is complete, adjust internal climate before arriving at the car, and verify the auto's location. Safety and security features include remote door lock/unlock, and parental monitoring of the vehicle's use.

We also developed parallel functionality for drivers to interact with their vehicles using Amazon Alexa, which required highly sophisticated voice recognition and processing. Security is maintained using token-based authentication and authorization and the user's personal identification number.

Our Approach

We helped the automaker rethink how users interact with its vehicles by improving the user experience of its mobile application and creating a new "conversational channel," using Amazon Alexa.

Results

- Designed and integrated new features into the manufacturer's electric vehicles and luxury brand.
- Enabled service alerts and vehicle monitoring in the mobile app.
- Improved customer experience with added convenience, safety and security, including voice commands.

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Medical equipment provider on-plan to reach full convergence of connected devices by 2020

The Challenge

A major provider of medical equipment needed to reinvigorate its stalled initiative to implement IoT across its full suite of hospital equipment products. The business had acquired several companies, and while 70% of these products had some element of connectivity, many had their own protocols for how they connect and operate. The goal was to achieve full operational convergence of its connected devices by 2020; doing so would ensure devices were updated automatically, rationalize the IT architecture and enable new revenue streams through data monetization.

We had provided the company with an IoT roadmap, which the business had pursued internally. However, progress was slow while customer demands increased.

The Solution

Using an Agile development process, the ThingWorx® IoT platform and Microsoft Azure, we focused on a modular, scalable, manageable approach to implementing the company's IoT solutions.

In line with the company's enterprise digital strategy and working with a cross-functional team, we're enabling remote monitoring, near-real-time service, proactive field servicing and optimized rental processes across the company's flagship product line. This approach will result in incremental improvements to these products, while increasing IoT-enabled interoperability that will return value to the company and its customers in the long term.

The solution can be progressively applied across the portfolio, while reducing duplicate or outdated toolsets. Once the onboarding work is complete, we'll focus on enabling downstream analytics.

Our Approach

We helped the medical device manufacturer address the shortfalls of its IoT enablement initiative, enabled implementation across a range of operating divisions, and helped monetize its IoT-enabled equipment.

Results

- Prioritized top-level products for which digital enablement would promote customer satisfaction and return the highest value.
- Developed a plan to make incremental improvements while increasing IoT-enabled remote monitored services.
- Minimized IT costs as a new or existing product is onboarded, while winnowing out duplicative or legacy digital toolsets.
- Accelerated time-to-market of add-on new services of flagship products while utilizing platform-as-a-service approach.

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Global appliance manufacturer envisions its products' future in the connected home

The Challenge

A global appliance manufacturer wanted to roll out a suite of connected, intelligent devices that enhance the customer experience in the home while making consumers' lives easier. The future of consumer appliances, the company believes, revolves around intelligent cooking (accessing recipes, simplifying shopping and improving cooking technique and flavor) and intelligent management of laundry and household tasks.

In both cases, appliances would select information, interact with owners and inform them when tasks need attention or are complete. Machines would send alerts to users, diagnostics to service personnel, and anonymized data to product development. Devices should be able to interface with suppliers to place orders, and update software or add new features automatically.

The Solution

Our multidisciplinary team embarked on an organizational deep dive to gauge our client's IoT maturity, and ensure its architecture could support that initiative. Through meetings with stakeholders in IT, design, product engineering and business management, we assessed the viability of technology feature sets end-to-end, and how hardware needed to evolve to enable intelligent capabilities.

As a result of our findings, the company is now putting in place the product managers, IoT architecture and management structure to develop more realized designs and more complete technical specifications.

As we've established relationships with important stakeholders, and delivered recommendations directly to the C-suite, a project initially focused on product design, function and IoT effectiveness has led to our participation in strategy development and the transformation of the client's business.

Our Approach

We connected the appliance manufacturer's business strategy and conceptual design to its product engineering team, and established priorities for product enablement. We also assessed its forecasted feature sets for viability, and aligned them with customer experience design.

Results

- Connected strategy and design to product engineering.
- Established priorities for product enablement.
- Created new roles to support product development, such as product managers and end-to-end system architects.

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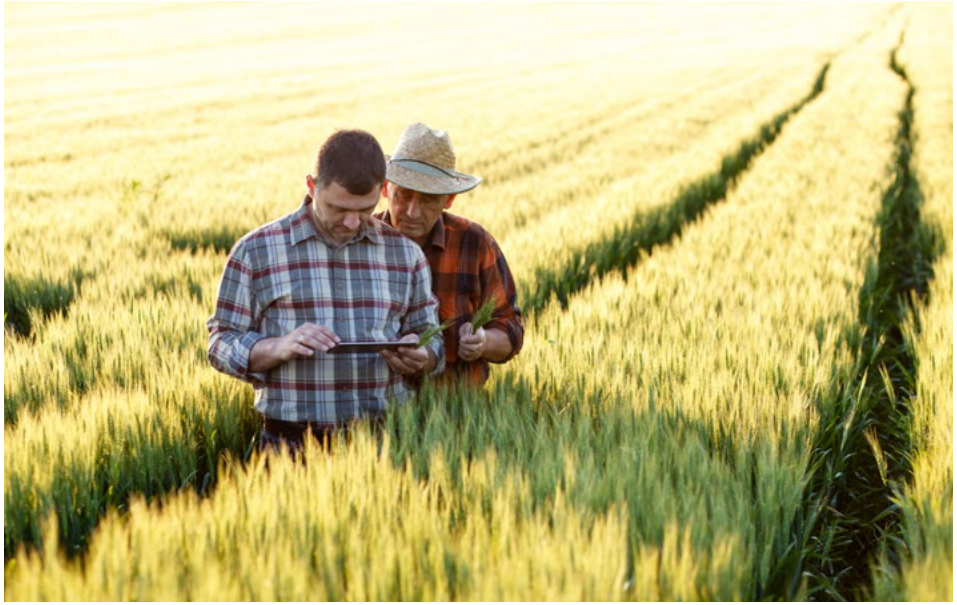
Bringing the labor-intensive business of agriculture into the digital fold

The Challenge

An agricultural services and support organization envisioned the need for an easy-to-use digital application to help farmers monitor the health of their fields directly from their mobile devices, allowing them to take action before a problem occurred. For farmers around the world, irrigation has become more cumbersome, due to unreliable weather patterns and the cost of water, labor and irrigation infrastructure.

The organization wanted to provide farmers with real-time information on weather, humidity and crop needs, and provide accurate irrigation forecasts and field status, with little infrastructure cost.



The Solution

Using our "Insight-to-Code" methodology, we developed an integrated application that provides daily satellite data and alerts on weather, irrigation needs, areas that are water-stressed, and metrics for field health. Using their mobile devices, farmers can also track resource usage, save water and electricity, and lower labor costs. Supplying farmers with relevant information about crop health and efficient water use results in improved crop yields and gives the farmers more control over their land.

With user experience at the forefront, we implemented a responsive web design platform, using an intuitive design flow and video tutorials to coach on application usage and capabilities. Sales teams can track farmer engagement and generate leads, and marketing and customer engagements can be planned through Salesforce.com and SAP integration.

In a future release, leads will be leveraged for add-on sales opportunities. The system now has active users in Italy, Spain, Portugal, Romania, Hungary, Turkey, Greece and Ukraine.

Our Approach

We built an easy-to-use application with an intuitive interface to allow farmers to make decisions about where and when to irrigate, in order to optimize resource use.

Results

- 20% savings in water use.
- 17% improvements in irrigation water productivity and fuel cost efficiency.
- 300 farmers in Europe currently use the application to monitor their fields; 1,500 farmers targeted by end of 2018.

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Creating New Revenue Growth

Transportation OEM drives new revenue streams through connected vehicle data

The Challenge

A leading manufacturer of commercial trucks, buses, defense vehicles and engines wanted to drive operational and performance improvements, using insights from vehicle data patterns. However, it faced significant industry challenges, including driver attrition, new regulatory compliance demands, stagnating revenues and rising costs.

The Solution

With our help, the manufacturer shifted its vision to changing its business model by becoming a value-added provider of critical information to its freight trucking clients.

We helped mine the company's enormous volume of IoT data to develop insights about product performance and customer behavior. We demonstrated how to use sensors, telemetry and custom analytics to gather and process diagnostic equipment data and operational data, such as fuel consumption, driver behavior and run-time vs. idle time on longer routes.

We then built an open digital marketplace designed to improve driver experience and reduce fleet liabilities. We created the system architecture for the platform, applications, analytics and APIs that connect to the company's devices, integrating those devices with data from its telecommunications provider and conveying it to its data warehouse.

The manufacturer can add in data sets for traffic and weather, layer in geo-fencing and offer insights to optimize travel routes and times, reduce fuel consumption and lower maintenance costs — improving driver experience and retention. This data is made available to applications on the platform, including a drivers' app that provides electronic logs and details on vehicle health.

Our Approach

We designed and delivered an industrial information ecosystem integrated with our client's existing data platform, and developed ways to deliver information as a monetized service to a variety of customers.

Results

- Ability to operate in a value-added manufacturing ecosystem, using an integrated platform that pulls in data from individual trucks to entire fleets.
- Development of a new business and new partnerships, while keeping CapEx investment low.
- Launch of a new subscription-based driver information and management business, with the goal of 50,000 subscriptions after six months, 500,000 after one year, and ultimately over one million.

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With a connected car platform, automaker develops a whole new value proposition

The Challenge

In the face of changing consumer trends, a global vehicle manufacturer wanted to increase the value proposition of its sport utility vehicles (SUV), while also developing new sources of revenue to compensate for decline in vehicle sales.

The Solution

We engaged with the automaker across business lines to improve customer experiences and digital business processes. Through our connected products, interactive experience, digital engineering, and quality assurance and testing teams, as well as our partners ReD Associates and Idea Couture, we conducted projects along three principal axes: a connected car experience, a lifestyle application and analytics for design agility.

We first worked with the company to design, develop and roll out digital services that make the experience of using the SUV more enjoyable and useful. Second, we developed apps to help customers better manage

their vehicles. And third, we created new revenue opportunities through in-app advertising and the sale of anonymized customer behavior data.

Key to our approach was an ethnographic study to gain a deep understanding of customer needs, behaviors and preferences. Using our "Insight to Code" model, we moved from research to production-ready code for the app in only six weeks. The automaker introduced the app with its 2018 models and is exploring potential revenue-sharing partnerships.

Our Approach

We helped the business identify, design and build innovative capabilities and services that drive value, loyalty and engagement with car owners. The connected car platform is foundational to the automaker's plan for intelligent mobility and its evolution toward autonomous vehicles.

Results

- Customers report the application greatly reduces barriers to having outdoor adventures, which increases the perceived value of SUVs and opens potential new revenue streams.
- The target market includes more than one million of the company's portfolio of car owners.
- Created new revenue opportunities through location-based advertising or sponsorship, fees for use of the application, and the sale of data about customer needs and behaviors.

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About Cognizant Digital Business | Connected Products

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: CTSH) 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 195 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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