Digital Transformation with the Internet of Everything

Manufacturing Customer Stories

For 30 years, Cisco has been committed to changing the way the world works, lives, plays and learns.

We have helped the world connect to the Internet, embrace voice, video, and data communications and blend technology and business together in ways that many thought were impossible. Together with our partners, we have been able to help our clients innovate, manage market transitions and turn technology into business advantage.

Two years ago, we began a discussion about the next wave of the Internet – a digitized world where the networked connections of people, process, data and things are brought together to unlock unprecedented business value. The power of the connections unlocks new types of data and insight, and physical and virtual environments are blended seamlessly for greater business and societal outcomes. We called this new digital era the Internet of Everything.

Now the term "digital" is everywhere – digital transformation, digital business, and digitization are the key topics in nearly every technology or business conversation. While many are now defining what it means to be digital, very few have defined how industries, cities, and countries are becoming digital.

Cisco and our partners have been working with innovative clients around the world to help them digitize. We are building and implementing digital roadmaps and transformations in industries from manufacturing to retail to government. We are helping countries transform the citizen experiences, banks reimagine the customer experience, and helping energy providers become more efficient. And we're doing it today.

We invite you to read the stories of manufacturing companies who are using the Internet of Everything to become digital. They are turning technology into business outcomes and are truly changing the way we work, live, play and learn. And to read the stories of other industries, click here.

Sincerely,

Mike Riegel
VP, Internet of Everything
Cisco

Manufacturing

Benteler
Automobiltechnik GmbH

Bosch

Device Manufacturer

FANUC

Mahindra and Mahindra

Panasonic

Shelburne Vineyards

Stanley Black & Decker

Sub-Zero

TATA Motors

Trident Group

*Benteler Automobiltechnik GmbH Automates Plants
and Processes to Maintain Competitive Advantage*

Leading manufacturers are racing to harness the possibilities being created by digital transformation. When every tool and part is connected to the network and production processes can be analyzed and controlled from the cloud, factories are able to achieve better outcomes, faster changeovers, and tighter cost controls. As more seamless ways to connect people, process, data and things have emerged, automotive manufacturers such as, Benteler Automobiltechnik GmbH, are taking giant steps toward evolving its factories.

German-based Benteler operates 70 plants in 29 countries, and nearly every major automaker worldwide relies on their components. To make its factory floors more agile and efficient, Benteler created a fully modular next-generation production environment of automated, self-running plants with the help of Cisco and its extensive ecosystem of partners.

With Cisco's Application Centric Infrastructure (ACI™) and ruggedized routers and switches, Benteler's new production environment is powered by a robust foundation. In order to connect the tools, parts, and belts in each factory to each other and to a central location, Benteler worked with Cisco® Partners nemetris and CANCOM DIAS. Together, they built the appropriate applications through fog computing and cloud, as well as integrated hardware and software components to provide Benteler with an easy to manage, end-to-end solution.

By connecting every aspect of the factory together, Benteler will soon realize better outcomes, faster changeovers, and increased operational efficiencies with the Internet of Everything (IoE).

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With the Internet of Everything, Benteler Automobiltechnik GmbH will soon realize:

Faster changeovers

Increased operational efficiencies

"The advantage we get from the Cisco Partner Ecosystem is seamless integration between the hardware components and the software side. To get this out of one ecosystem, that is a significant value for us as a customer."

Alexander Stamm, CIO, Benteler Automobiltechnik GmbH

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*Bosch Connects Industrial Tools for
Improved Quality and Safety in the Factory*

To achieve the highest quality standards in industrial manufacturing, connecting tools, people, and processes on the plant floor is key. Recognizing the advantages of a connected factory, German multinational engineering and electronics company, Bosch, partnered with Cisco to improve product quality and worker safety.

Today, Bosch's tools are fully connected and generating production data. With information on the tools' location, calibration state, and other context, workers now have a detailed overview of the conditions of their tools at all times. As a result, Bosch has automated a number of routine tasks such as the replacement of worn parts on power tools. Bosch is also able to record the torque used to tighten hundreds of thousands of bolts

and to store that information for quality, tracking, and traceability. This provides workers with clues as to the possible causes of torque faults and improves overall quality. These new connections are also aiding in error avoidance. If a worker tries to use a tool mistakenly for the wrong task, the tool automatically powers itself down to avoid a potentially critical manufacturing mistake.

Cisco is providing the precision location identification of the tools. Bosch supplies the cordless nutrunner used to track the tools, and Bosch Software contributes to the software used to gather and evaluate data. Working in partnership with Cisco, Bosch is harnessing digital technology to improve the safety of its workers and the quality of its products.

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Bosch created a connected factory with the Internet of Everything, achieving:

Increased efficiency and competitiveness and a lower number of errors

Increased safety for workers

Cross-industry cooperation and universal use of tools from open standards

"Connected tools contribute not only to product quality and safety, but also to making production more efficient, which improves competitiveness."

Dirk Slama, Project Manager, Bosch

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*A Device Manufacturer Assesses the Digital
Security of New Products Early in the Lifecycle*

As the Internet of Everything (IoE) becomes reality and the number of connections to the Internet proliferate, it's essential that security is built into networks, devices, and applications to protect businesses and consumers from cyber threats. Enabling seamless and secure access across a diverse array of people and endpoints requires careful attention to security. In order to assess the security of these pieces of technology, a device manufacturer called in Cisco.

Cisco® security experts performed a comprehensive audit of all of the manufacturer's client devices and the associated apps and cloud platforms that support them. After assessing the customer's environment for potential avenues of attack, Cisco recommended solutions to close gaps in the manufacturer's security coverage. Cisco increased the manufacturer's understanding and awareness of how the IoE is changing the security challenges of today and influencing remediation plan development and implementation.

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With the Internet of Everything, this device manufacturer:

Identified and remediated vulnerabilities

Avoided expensive reorganization of security infrastructure and initiatives based on information gained in the Cisco device audits

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FANUC Gathers Predictive Analytics and Generates Greater ROI for Customers

Manufacturing plants are running at a much higher capacity utilization than ever before. Often, it is a 24-hour a day, seven days a week operation. With downtime costing plants up to US$20,000 a minute, they cannot afford disruption to their processes. In fact, a single occurrence can cost a plant upwards of US$2 million.

Founded more than 50 years ago, FANUC provides a wide range of automation equipment for automotive components and the general industrial market. FANUC was struggling with lack of visibility into how their customers were leveraging FANUC equipment on the factory floor. The only insight was gained after a problem had already occurred resulting in costly downtime for the customer. After meeting with Cisco and exploring the possible solutions, they saw potential to change their entire go-to-market business strategy. Leveraging the Cisco Intercloud™ solution, FANUC can extract customer data, store it in the cloud, and leverage predictive analytics to remedy any potential problems before it can negatively impact their customers. FANUC leveraged Cisco expertise to influence their customer's IT departments to share their data in the cloud.

By storing their customer's data in the cloud and improving their response time to potential incidences, FANUC is leveraging the Internet of Everything (IoE) to deliver a proactive go-to-market strategy for their customers.

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FANUC is capturing value with the Internet of Everything. They are:

Improving their go-to-market strategy

Saving US$2M in costs from reduced hours of downtime with big data and analytics

"I've been in manufacturing automation for 35 years and what we are working on with Cisco has the potential to have the biggest impact more than anything I've seen in that timeframe."

Rick Schneider, CEO, FANUC

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Mahindra and Mahindra Increases Operational Efficiencies and Improves Energy Management

For many manufacturing companies today, the opportunity to connect people, process, data, and things created by the Internet of Everything (IoE) presents a new way to look at factory automation. The opportunity for digital innovation often arises when a company is expanding capacity or building a new production facility. Mahindra and Mahindra, one of India's leading automakers, seized the opportunity to deploy a connected factory of the future at their new Chakan facility.

As they prepared for a brand new plant, Mahindra and Mahindra saw the opportunity to rethink the design of their manufacturing operations for greater flexibility and agility. Combined with their desire to embrace the latest technology, the company looked for a manufacturing process that used digital manufacturing tools and a high-level IT architecture for the plant. With the help of Cisco, Mahindra and Mahindra migrated from a traditional IT system to a

dynamic, integrated, real-time and connected environment with unified communications. By automating all aspects of production— from top floor to shop floor, the company provides IT with visibility on all 20,000 IT and operational technology (OT) systems from the command center.

Today, Mahindra and Mahindra have reduced their changeover time on the shop floor and improved quality as a result of discovering issues sooner. Better decisions are made due to more accurate and timely reporting, and connecting people and equipment on the factory floor over Wi-Fi has helped them with higher output. With a connected factory, Mahindra and Mahindra is embracing the IoE for better energy management and increased operational efficiencies, leading the company to produce state-of-the-art, environmentally friendly vehicles of the future.

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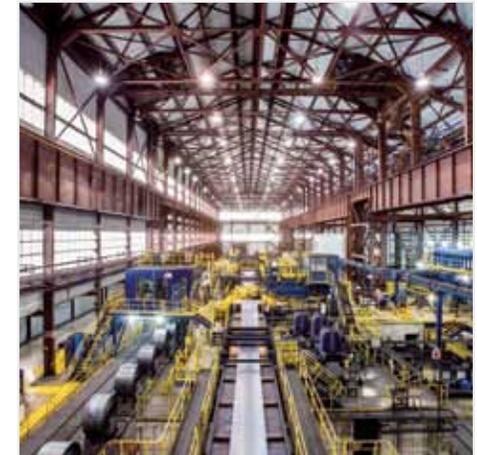Sub-Zero

TATA Motors

Trident Group

With the Internet of Everything, Mahindra and Mahindra has:

Reduced changeover time on the shop floor

Improved quality with the ability to track the manufacturing process in real time

Improved reporting with the ability to drill down to gain a deeper understanding

"There were many parts of the lifecycle journey that we were missing. Now we get this connectivity in a very simplistic way in the Internet of Everything."

VS Parthasarathy, CFO & Group CIO, Mahindra and Mahindra

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Panasonic Partners with Cisco to Enable Digital Solutions Across Numerous Industries

Panasonic understands that reimagining your business for the digital era can lead to new opportunities. With more than 80 percent of its revenue coming from business-to-business (B2B) customers rather than consumers, the company has evolved its vision and strategy to embrace digital transformation by leveraging technology to improve business efficiency and profitability for its customers. Panasonic is incorporating the connection of people, process, data, and things into its digital journey.

As part of this process, Panasonic partnered with Cisco to create end-to-end solutions in key market segments. In the retail environment, Panasonic is connecting the mobile devices in its broad portfolio of intelligent endpoints to Cisco® Enterprise Mobility Services Platform, which supports backend data integration, mobile application management, and application development to

help customers accelerate and simplify their mobile application development. To further enhance the customer experience, Panasonic is leveraging Cisco Integration Platform and analytics technology to increase customer engagement and profitability.

In healthcare, Panasonic and Cisco are partnering to create a new "patient media experience". Leveraging Cisco networking and collaboration technologies, Panasonic can deliver video and interactive content through its devices from the moment patients are admitted to the moment they are discharged.

By partnering to bring relevant, connected solutions to key industries, Cisco and Panasonic will deliver transformative digital experiences to their customers.

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Panasonic is enabling digital solutions. They have:

Increased customer satisfaction

Improved business efficiency and profitability

Increased patient education and delivery of care

"Everyone talks about connected healthcare, but taking it from concept to deliverable and making it deployable – that couldn't be done without Cisco's help."

Jamil King, National Sales Manager, Panasonic

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Shelburne Vineyards Creates Smart Farming on the Vine

As one of the first commercial vineyards in Vermont, Shelburne Vineyards has been operating since 1998. The business is heavily dependent upon the weather and every minute is critical. The vineyard turned to digital technology and the Internet of Everything (IoE) to better understand and predict all of the elements that go into producing the best product possible.

Shelburne Vineyards installed a sensor system that monitors temperature, air, soil, degree of wetness of the leaves, and humidity every two minutes. This data is uploaded to a Cisco®

cloud for analysis, which then provides the vineyard needed information to make crucial management decisions. Shelburne Vineyards can compare temperature profiles from year to year to determine the best time for harvest, when to spray to prevent disease, and how to pioneer new grape varieties.

With digital transformation, Shelburne Vineyards can turn the data collected by newly connected sensors into predictable quality to improve their wine-making processes, and to provide the highest quality product to their consumers.

Manufacturing

Shelburne Vineyards uses smart farming to:

Provide the highest quality product to consumers

Improve decision-making based on analytics

"This technology could improve the entire spectrum of agriculture; the quality of the food supply, yields, taste, disease resistance … agriculture would be more effective in feeding our ever-growing population."

Ken Albert, Owner, Shelburne Vineyard

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Stanley Black & Decker Turns to Cisco for Visibility and Productivity Gains

Stanley Black & Decker strives to integrate technology solutions into business operations. With 40 multiproduct manufacturing lines, producing millions of power tools each year, they needed a strategy to manage this scale of production and manufacturing complexity. To do this, they turned to the Internet of Everything (IoE) and partnered with Cisco and AeroScout.

Powered by a Cisco® robust wireless network and AeroScout Industrial's leading enterprise visibility solutions, Stanley Black & Decker's plant in Reynosa, Mexico became a fully connected production line with Real-Time Location System (RTLS). The RTLS includes small and easily deployed Wi-Fi Radio Frequency

Identification (RFID) tags that attach to virtually any material and provide real-time location and status to assembly workers, shift supervisors, and plant managers through tablets and smartphones. With real-time visibility into track production, floor managers are constantly aware of each line's output, whether production needs to increase or decrease to meet daily targets, and how quickly employees are completing their respective stages of production. Now thanks to the IoE, Stanley Black & Decker can better understand how to increase efficiency, lower the costs associated with housing and managing that inventory, and offer greater customer service by providing accurate delivery schedules.

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With the Internet of Everything, Stanley Black & Decker is experiencing:

24 percent improvement in overall equipment effectiveness (OEE) in its router line

Improved labor utilization from 80 to 92 percent

A reduction in labeling error rates by 16 percent and inventory holding costs by 10 percent

"With the help of the Cisco and AeroScout Industrial solution, we are on our way toward realizing our vision of a virtual warehouse and fully connected factory, with complete visibility and traceability."

Gary Frederick, CIO Industrial Division, Stanley Black & Decker

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Sub-Zero Accelerates Product Design, Streamlines Field Service, and Improves Production Uptime

A leading manufacturer of luxury appliances, Sub-Zero, consistently looks for technological innovation to stay competitive. When faced with its largest product roll-out in company history – 60 new appliance models across refrigeration and its premium cooking brand – they looked to Cisco, Librestream, and the Internet of Everything (IoE) to aid the design, launch, and ongoing manufacture of its new products.

To effectively support the massive new product design, Sub-Zero looked to connect people in new ways by enabling employees to stay connected with external suppliers and partners through continuous communication and collaboration. Using Cisco TelePresence® and wireless technology to connect engineering teams through live video sessions, design and production issues are rapidly resolved resulting in increased productivity. On the manufacturing floor, Librestream's rugged mobile cameras

connected wirelessly through the network enable employees to communicate more effectively with colleagues, global suppliers, distributors, and vendors in real time. As a result, Sub-Zero has reduced product introduction cycles by 10-20 percent, reduced production line downtime by five-ten percent and saved approximately US$100,000 to date on field testing.

Overall, Sub-Zero is a prime example of how savvy manufacturers are using the Internet of Everything to rethink product design strategies. By connecting people, process, data and things, Sub-Zero is innovating with service delivery, supply chain collaboration, and competitive advantage.

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Sub-Zero has captured value with the Internet of Everything. They have realized:

10-20 percent time savings in new product introduction cycles

Internal savings in downtime costs of US$2,500 per production line per hour through faster resolution of design or manufacturing issues

Over US$100,000 savings in field testing costs

"It's important for Sub-Zero not only to embrace the Internet of Everything, but to use it to make our product better, and our jobs easier."

Arturo Bonomie, Staff Engineering, Sub-Zero

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TATA Motors Connects People to Vehicles in a Whole New Way

As India's largest automobile manufacturer, TATA Motors relies heavily on innovation and efficient operations to stay ahead of the competition. The company is spread over 170 locations and six plants, so it understands that a stable communication network and a resilient IT platform are crucial to its success.

Partnering with Cisco, they have been able to connect people, process, data, and things more than ever before. Cisco provides end-to-end routing needs, switching devices for better connectivity, and video conferencing products to help the teams collaborate more effectively.

With this digital transformation, fleet owners can monitor their vehicles. Schools can build a web portal showing parents when buses will arrive. The new, "connected car" services include emergency breakdown alerts and usage-based insurance programs. And because TATA Motors recognizes that the Internet of Everything (IoE) will impact every part of the value chain — from sourcing, to the supply chain, to manufacturing where machines can be monitored in real time — it remains agile in the fast-paced environment. As a result, TATA Motors is providing better service to its customers.

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With the Internet of Everything, TATA Motors has:

Decreased expenses with collaboration through video conferencing

Increased customer satisfaction through vehicle data as a service

Increased revenue due to greater efficiency and connectivity

"The Internet of Everything makes the world more efficient."

Jagdish Belwal, CIO, TATA Motors

Manufacturing

The Trident Group Secures and Streamlines Operations with a Digitized Factory Floor

Headquartered in Punjab, India, the Trident Group is a bustling manufacturer with market segments ranging from yarn to chemicals. As India's largest exporter of towels, to clients such as WalMart and Macy's, they have over 13,000 employees across three manufacturing locations. In order to support efficient and secure operations, they needed to harness connectivity on the factory floor.

Today, Cisco® wireless technology works to connect people, machines, and processes within Trident Group. All of the campuses are fully Wi-Fi-enabled and have 24-hour video surveillance. When employees enter the plant, technology captures biometric information such as fingerprints and eye scans. On the plant floor, every tool, machine, and employee is connected with Wi-Fi and

collaboration tools such as Cisco TelePresence® and WebEx®. If an employee has a question or problem with a machine, a quick video call to a remote expert can rapidly mitigate the problem and keep production on track. And with data being collected on every machine and employee, analytics can inform maintenance schedules and help predict when problems arise.

To become a fully connected factory, Trident Group turned to Cisco to create a streamlined process, from the minute employees walk in the door, until a final product is shipped to over 70 countries – with security pervasive throughout. With the Internet of Everything (IoE), the Trident Group has bridged the communication gap so that the shop floor can connect with the top floor, allowing heads of the company to make critical business decisions easily.

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With a digitized factory floor, the Trident Group is now:

Increasing reaction times to problems

Improving tenant experience

Saving time and money with instant collaboration

"This organization is spread to various locations so everything needs to be integrated. And there has to be a centralized location from where all of the services will be provided from the IT perspective."

Sanjiv Pant, CIO, Trident Group