FUJITSU

White paper

Manufacturing, Industry 4.0 and the hyperconnected business of the future

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Introduction

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For example, some factories are now able to quickly and affordably produce consumer goods that aren't one-size-fits-all but are instead custom-made, tailored for each individual customer's tastes. And innovative industrial machine-makers are working to ensure their equipment will never break down, thanks to intelligent, around-the-clock monitoring and predictive maintenance to identify minor problems before they became major problems.

These and other solutions are being enabled via an initiative known as Industry 4.0. Launched in Germany in 2011, Industry 4.0 is seeing widening adoption across Europe and is beginning to deliver numerous benefits that were unthinkable just a few short years ago. And Fujitsu is among the first of several dozen companies working with the initiative to enable a future where manufacturing becomes hyperconnected, with more real-time data and visibility for improved efficiency, predictability and innovation.

Origins and evolution of Industry 4.0

As its name implies, Industry 4.0 is just the latest of several generations of technological change that have come to the manufacturing sector. For instance, long before the arrival of the Industrial Internet of Things (IIoT), manufacturers, utilities and similar companies were using automation in the form of SCADA (supervisory control and data acquisition) systems or RFID (radio-frequency identification) tags for tracking goods and equipment.

Compared to earlier generations of automated technologies for manufacturing, however, Industry 4.0 is more than just another incremental step forward. Instead, it embodies changes that can rapidly and radically reshape industrial operations, processes and value chains for increased competitiveness and cost-effectiveness. This is also transformational for customers.

It's about much more than automation. Rather, Industry 4.0 stands to reinvent manufacturing in entirely new ways. Through a variety of hyperconnected technologies, industrial companies can better understand operations in real time to optimize and transform how they work with suppliers, partners and customers.

Launched by Germany's scientific/advisory Research Union in 2011, the Industry 4.0 initiative aimed to ensure a hyperconnected, more efficient future for the country's largest business sector. Manufacturing accounts for nearly a quarter of Germany's GDP, so it's essential the sector remains competitive, especially in a fast-growing global market where many nations have much lower labor costs.

Industry 4.0 thinking has now expanded far beyond Germany's borders to deployments in France, the UK and other parts of Western Europe. Initiatives to promote digital innovation in manufacturing are also under way in China, Japan, the US and elsewhere.

In a nutshell, such initiatives have the same goal everywhere: to not only make manufacturing smarter and more autonomous but to decentralize and hyperconnect industrial processes for more flexible, sustainable and personalized production in real time. With an ideal deployment, this approach stands to bring the production cost for an individual order very close to that for the same item when mass produced. Such an outcome can help industrialized regions such as Europe and North America practically eliminate their labor cost disadvantages compared to countries like China or India.

Fujitsu: A new perspective for industry

So why and how has Fujitsu become such a key player in the Industry 4.0 initiative? Its role has grown out of its unique capabilities and expertise in multiple areas related to the use of hyperconnected technologies in manufacturing. These experiences have provided the company with one-of-a-kind insights and perspectives.

First, unlike many other technology companies now moving into Industrial Internet of Things projects, Fujitsu is itself a manufacturer. It has long operated many factories around the globe, including an advanced computer manufacturing facility with state-of-the-art processes and laboratories in Augsburg, Germany. The knowledge and experience gained from operating its own factories gives Fujitsu first-hand awareness of the special challenges facing today's industrial customers.

For example, as a manufacturer itself, Fujitsu understands the importance of supply-chain visibility and efficiency. Consider the many thousands of small companies that make components for larger original equipment manufacturers (OEMs). To maintain such business relationships in an increasingly competitive global market, these small suppliers need to automate as much as possible.

Working with Fujitsu, one industrial client – Meggitt Composites – was able to do just this. By applying Fujitsu GlobeRanger's RFID system to every part used and assembled in its factory, the company has gained instant visibility of its entire manufacturing process. Measurements and fault corrections can be made in real time with the help of a graphical dashboard, providing the company with full electronic accountability.

As a long-time provider of IT infrastructure, integration, consulting and other services, Fujitsu also understands the issues that can arise when manufacturers look to update and modernize their information technology systems.

What's more, Fujitsu has special advantages when it comes to deploying and managing the many moving parts needed to create an effective, hyperconnected business. For example, its experience in engineering and developing cloud-based systems for enterprise customers provides it with a solid foundation for rolling out similar programs in a manufacturing environment. And its strengths in analytics, pattern recognition and other data-driven processes lets it help industrial users put information from machines, remote sensors and other devices to effective, productive use.

Look, for instance, at Baker Hill Industries, a Fujitsu customer that makes precision machined components for the aerospace industry and other markets. It's using GlobeRanger to monitor operations for issues in real time. Continuous status updates alert the company to any

process that's not performing to expectations, enabling it to respond immediately with fixes and preventing lost production time.

Finally, thanks to established partnerships with many other leading technology companies and a history of competency across Europe, the Middle East and Africa (EMEA), Fujitsu is uniquely positioned to help manufacturers in EMEA advance their Industry 4.0 ambitions quickly and successfully.

Put together, all of these elements enable Fujitsu to deliver hyperconnected business solutions for its manufacturing clients that use market-leading products, share data effectively and securely, maintain system availability and optimize cost savings.

Industry 4.0 in action

Leaders in the Industry 4.0 initiative initially thought they were being over-ambitious by aiming to publish 100 use cases during the first full year of the program. By the end of 2015, however, they had assembled 203 examples of IIoT projects in action, mostly across Germany.

While available technologies are continually evolving, the primary goals for such projects typically fall into several areas of innovation: more intelligently automated production processes to increase efficiencies and reduce costs, optimized integration of value chains for improved labor and asset productivity, and the introduction of smarter, value-adding services such as predictive maintenance to reduce industry downtime and other inefficiencies that can lead to lost revenues.

Fujitsu is helping to bring about such benefits through digital solutions that let manufacturers, partners and customers better collect, share, understand and put to use a wide variety of data. For example, by using hyperconnected systems to gather performance data from hundreds or thousands of industrial machines used by different customers, a manufacturer of such machines can then apply advanced analytics and artificial intelligence to that data to gain insights into factors or conditions that could cause less-than-ideal performance or even machine failures.

Insights like these can, in turn, allow manufacturers and their stakeholders to co-create transformational changes in how they work together.

For instance, Fujitsu's technologies can help industrial machine manufacturers to better predict optimum maintenance dates for their equipment, helping their customers to achieve maximum system availability with the fewest service calls. Such capabilities will be increasingly vital for industrial firms that want to stay competitive.

IIoT solutions can also enable companies to develop innovative new services for their customers. One Fujitsu customer, an airport operator, was looking for ways to encourage airlines to use its own greener, more sustainable energy services instead of the on-board auxiliary power units (APUs) that are used to start plane engines and run electrical accessories. Fujitsu helped the airport deploy and test a sensor that uses sound to detect when an APU is in operation. By being alerted to APU use, the airport could then contact the airplane's crew to offer an alternative power source.

Having proved successful in early deployments, the system will eventually be rolled out across the entire airport. In fact, Fujitsu is now developing the system as a new product that can be offered to other airports across Europe and around the world.

Yet another example of Industry 4.0 in action can be seen in a wind turbine manufacturer's use of ultrasound photography to detect weaknesses and flaws in its products without any invasive procedures. As an expert in algorithmic image pattern recognition, Fujitsu was able to help the manufacturer reduce its average rotor-blade checking times from one-and-a-half days to just two hours.

Beyond the beginning

Eventually, IIoT technologies could help manufacturers create hyperconnected systems that allow them to interact with customers, suppliers, logistics companies and other partners in entirely new ways. Imagine, for example, a world in which factories of all kinds could offer one-of-a-kind products tailor-made to individual customers' specifications, yet manufactured as quickly and inexpensively as mass-produced goods. Industry 4.0 technologies and processes could make possible a much wider range of such personalized, innovative products that are customer-led.

As Industry 4.0 technologies continue evolving, Fujitsu is looking to encourage wider adoption, and to help early adopters expand into newer, even more advanced applications. To help with that mission, it has launched a new Industry 4.0 Competence Center in Munich that brings together its many hyperconnected business capabilities under one roof. The center's goal is to help manufacturing customers speed up their digital transformation efforts to ensure they can remain profitable and competitive in an ever-changing global market.

"Where once the focus was on implementing technology solutions, we are now engaged in discussions about connecting and transforming entire businesses and enabling our customers to succeed in multi-company ecosystems," said Dr. Rolf Werner, Fujitsu's head of Central Europe.

To find out how Fujitsu can help your company gain more visibility, efficiency and predictability, and to discover what a hyperconnected future can mean for your business, visit www.fujitsu.com/global.

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