Media Backgrounder
Manufacturing

October 2020

Overview

This year's global pandemic has hit manufacturers hard. Significant challenges such as stalled production, disrupted supply chains and ongoing uncertainty have made planning extremely challenging. However, this period of substantial change will accelerate the next phase of digitalization in manufacturing. While manufacturers have already embraced technology to deliver automation and improve efficiency, the next wave of change, often called Industry 4.0, will bring genuinely transformative change that will enable them to come back stronger than ever. The manufacturers who will emerge as leaders are the organizations able to implement technology to leverage their people's power effectively. This includes the automation tools and data insights needed to enhance their performance and the right company culture that delivers agility and resilience across the entire organization.

Industry 4.0 and the rise of the smart factory

Industry 4.0 brings virtualization, decentralization, real-time capabilities, service orientation, and modularity as the next phase of digitalization in manufacturing. It uses hyperconnected technologies to understand operations better and transform working with partners, suppliers and customers. It combines traditional production processes with innovative technologies, such as IoT and AI, to improve connectivity, communication, and automation. At the heart of Industry 4.0 is the smart factory. Machine intelligence, advanced networking, and real-time controls enable manufacturers to respond to disruptive trends, enter new markets and deliver better products. Ultimately, the target is to get ahead of operational challenges such as equipment maintenance and factory downtime.

Data-Driven Transformation

By building smart factories, manufacturers can move from basic, traditional automation to fully connected, flexible manufacturing, where valuable data is collected at all points to flow securely throughout the business. The vast volumes of data collected by advanced sensors at every step of the manufacturing process can now be turned into actionable insights to revolutionize operational decision-making. This data makes it possible to consider the entire end-to-end data pipeline at once – from supply chains to distribution networks. Customers are at the center of this model and their evolving needs drive decision making.

Key trends on the path to Manufacturing Transformation

As manufacturing becomes increasingly data-focused, every enterprise function will be affected, from design to manufacturing to supply chains, customer service and support. A new breed of manufacturers are emerging that are data-driven and highly automated, agile, and able to reconfigure to meet mass customization demands, highly productive and sustainable. Several dominant industry trends are driving this revolution:

- **Mass Customization** – The move towards mass customization is driving disruption as manufacturers must be agile and adaptable, with easily reconfigurable production lines. Large-scale streamlined production is changing to small-scale customized production.

- **Distributed Manufacturing** – The days of having a single massive manufacturing plant are coming to an end. Manufacturing is moving towards a more distributed approach where products are made, sourced and delivered close to where consumption occurs. Process design and control are still centralized, but micro-factories handle the rest of the process. Pushing the manufacturing closer to where the products are needed is also more environmentally friendly – as the need for transportation is significantly less.
- **Leveraging the network edge** – Data is continuously collected relating to every machine, component, and manufactured goods, enabling seamless visibility and an increasing level of automation. Sensors at the edge track all aspects of performance and bring sophisticated analytics, enabling many new usage-based advanced services and improved performance.
- **New value generation** – Emerging, advanced technologies such as the IoT, cognitive bots, and blockchain-as-a-service, all supported by digital trust, enable new value networks. This is creating many opportunities for new services and business models. This is also accelerating the speed of technology adoption.
- **Technology Revolution** – Increasingly sophisticated technology foundations that leverage advanced computing, IoT, specialized platforms, cloud, and machine-learning technologies are reinventing traditional processes through the insights they bring.
- **Sustainability** – By optimizing each operation's efficiency, manufacturers can reduce energy consumption and the waste they produce, leading to more environmentally friendly and sustainable production.
- **Ubiquitous digital connectivity** – The increasing prevalence of high bandwidth, including 5G networks, makes it possible to collect a vast amount of information about every aspect of the manufacturing process. This is delivering unprecedented visibility, including the creation of digital twins while increasing efficiency and minimizing unplanned downtime. These insights are also identifying previously unmet customer needs, giving rise to new business models.
- **Supply Chain Visibility** – The real-time visibility over the manufacturing process can now extend beyond each plant's walls to deliver oversight over the full end-to-end supply chain, including all parts, components in products through to their destination. By integrating all suppliers, it is possible for all stakeholders, including customers, to view the entire ecosystem of organizations and products required to deliver each product.
- **Machines supporting humans** – Digital transformation doesn't mean replacing people with automation. In smart factories, it means enabling and supporting employees to innovate, share skills, and drive operational excellence. Automation will help address workforce skills gaps, while augmented and virtual reality will enhance training and support workers to tackle complex tasks.

Fujitsu and Manufacturing

Fujitsu is not just a provider of technology solutions. With more than 80 years' experience as a manufacturer, Fujitsu has a first-hand understanding of the industry's challenges today. In working with other manufacturers to support digital transformation, Fujitsu builds every plan with people at its core. This is backed by the belief that Industry 4.0 is an opportunity to enrich the lives of both employees and customers while also generating new business value. The technologies implemented are designed from a human-centric perspective, to enhance and encourage the human capability; the passion, intelligence and creativity of the unique humans that are the basis of every business.

Fujitsu's co-creation approach is the key to unlocking the solution to each manufacturer's challenge. Technology solutions, such as robotics and AI, are paired with people to better focus on what they do best, supported by the advantages of technology. A holistic approach combines human empowerment, creative intelligence, and connected infrastructure.

Fujitsu helps manufacturing customers to **gain insights** by connecting assets and systems in real-time, enhancing production performance monitoring. This includes:

- Retrofitting legacy machinery with Internet of Things (IoT) sensors to increase data flows
- Delivering services using IoT, rather than just producing physical goods
- Use digital twin technology to virtually replicate machinery and model potential problems
- Gaining insights into existing processes by aggregating and visualizing machine data
- Visualizing data systematically across departments and factories in a hierarchical manner
- Gaining insights from data context using classic IT systems (e.g., ERP and CRM systems).

Fujitsu **optimizes production** and enables manufacturers to leverage data to empower makers by:

- Mapping production schedules to actual execution time to assess productivity
- Measuring energy expenditure and costs to identify opportunities to make reductions
- Optimizing planning with quantum-inspired optimization services, which can reduce production time by up to 30%
- Minimizing the effect on production by swiftly analyzing restart options following a production outage

Fujitsu is **improving quality** within manufacturing processes by implementing new, predictive approaches to maintenance using IoT technologies. By detecting process errors and improving quality at every stage using AI-driven optical quality assurance systems, manufacturers can:

- Solve problems that haven't yet occurred
- Forecast production requirements using machine learning algorithms
- Detect abnormal conditions so that engineers can anticipate repairs
- Minimize the annual cost of machine failures and dramatically reduce unexpected downtime

Customer stories:

- AdvanSix – United States
- Toray Industries – Japan
- Nilfisk – Denmark
- Orion Corporation – Finland
- UGN – United States
- Onward Holdings – Japan
- Rodenstock – Germany
- Laltex Group – UK
- Aisin Automotive Ltda. – Brazil
- Bridgestone – Thailand

Online resources

- Visit the Global Manufacturing website: www.fujitsu.com/manufacturing
- Read the Manufacturing content on the blog: https://blog.global.fujitsu.com/fgb/industries/?tags=Manufacturing
- Follow Fujitsu on Twitter: http://www.twitter.com/Fujitsu_Global
- Follow us on LinkedIn: http://www.linkedin.com/company/fujitsu

- Find Fujitsu on Facebook: http://www.facebook.com/FujitsuICT
- Fujitsu pictures and media server: http://mediaportal.ts.fujitsu.com/pages/portal.php
- For regular news updates, bookmark the Fujitsu newsroom: https://www.fujitsu.com/emeia/about/resources/news/newsroom.html

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