

**DIGITAL INDUSTRIES SOFTWARE**

# Three key essentials for equipment manufacturing

Integrating smart manufacturing for industrial equipment

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To stay at the forefront of Industry 4.0, component manufacturers must introduce increasingly innovative, specialized procedures that outperform their competitors' processes. This is especially true as more low-cost players enter the industrial components market, unencumbered by legacy technology or outdated manufacturing methods.

Disruptive business influences such as market variability and skills shortages are further complicating matters, where increasingly connected machines generate a plethora of data, leaving untapped potential for businesses that fail to undertake a digital transformation. Digital practices make it possible to further reimagine business models where companies use software and artificial intelligence (AI) solutions to efficiently solve everyday manufacturing challenges rather than rely on the incumbent knowledge limitations.

A holistic digitalization approach can accelerate necessary change for component manufacturers. With an intelligent manufacturing approach, you can navigate an increasingly complex landscape, driving greater operating efficiency, velocity and revenue outcomes for your business.

## Trends

### Trend #1.

**Disruptive influences:** Industry 4.0 increasingly requires customizable and highly versatile machine components that can adapt to fluctuating market needs. Simplistic, large batch productions with a one-size-fits-all mentality must face these challenges.

### Trend #2.

**Smart factories:** Industry 4.0 is driving operational efficiency and uptime improvements across the industry. The industrial internet of things (IIoT)

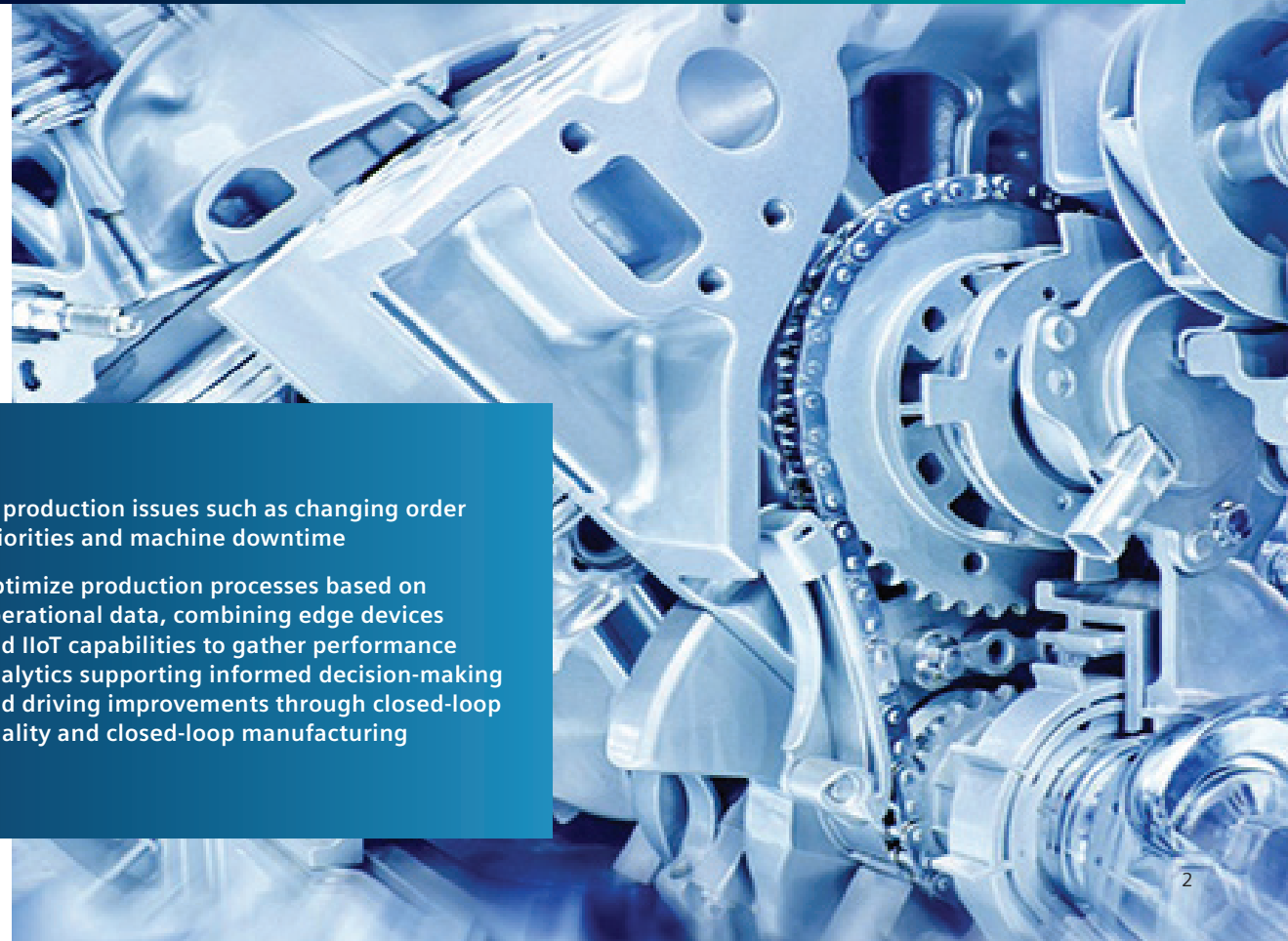
and edge computing connect production machines, spurring incremental manufacturing improvements with data and automation.

### Trend #3.

**Business model changes:** The future is digital, and technological changes in the industrial sector are rapidly occurring. Due to this, component manufacturers must heavily invest in research and development (R&D) relating to how they produce and not just what they produce.

## Key drivers

- Simulate factory and line environments before investing in expensive production machinery to deliver greater manufacturing flexibility that can quickly adapt to changes driven by customer needs
- Operate an agile manufacturing execution system (MES) using planning dashboards and integrated quality management system (QMS) software, supporting a rapid response to production issues such as changing order priorities and machine downtime
- Optimize production processes based on operational data, combining edge devices and IIoT capabilities to gather performance analytics supporting informed decision-making and driving improvements through closed-loop quality and closed-loop manufacturing



# Increasing revenue with smart manufacturing

Component manufacturers all face a common challenge: reducing product batch sizes without increasing resources or costs while maintaining or improving quality. Overcoming this challenge begins by reimagining the intelligent factory environment and engineering it for greater connectivity, agility and acceleration. Using smart manufacturing, a digital thread solution by Siemens Digital Industries Software, the smart factory concept can become a reality, and you can realize it by implementing three key imperatives: plan, execute and optimize.

## Plan manufacturing operations with ease

Designing, implementing and commissioning line automation and control systems that meet cybersecurity and safety concerns requires expertise that many companies lack. Siemens digitalization service experts can support and accelerate your company's transformation. By using a comprehensive digital twin for manufacturing, work cells, assembly lines and plant operations, you can holistically control your end-to-end manufacturing process. This can reduce costs and yield greater velocity while improving manufacturing efficiency. For instance, the digital twin

makes it possible to virtually validate and commission manufacturing machines and processes before implementing them on the factory floor. By having this visibility, you can identify production bottlenecks, safety concerns, line code errors and more, enabling you to make strategic changes and optimize your manufacturing processes. Software tools help you reliably ramp up production to achieve throughput targets and gradually introduce change to your operations, empowering optimized innovations.

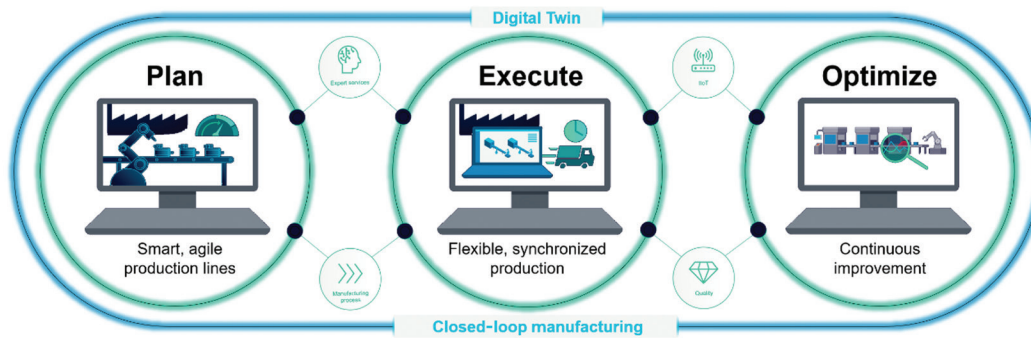
## Execute manufacturing for flexibly and efficiently

Effective component manufacturing requires meticulous planning and scheduling, anywhere from the same day to several years ahead. Quality must become part of your company's culture by integrating a QMS with your daily practices. To achieve these goals, you will need a flexible MES in place to tackle industrial component manufacturing challenges. Using an agile MES allows you to overcome increasing product variability by integrating your regulatory, quality and customer requirements into one cloud-based space, supporting component production

that meets all criteria. This cloud-based space also allows you to collaborate more effectively with your supply chain partners, helping you source cost-appropriate materials and resources for building parts. You can align with the shop floor to synchronize production processes and mitigate any costly errors that could arise and cause manufacturing delays. Leveraging a holistic MES empowers you to distill typical manufacturing complexity into a collaborative methodology, giving you a key competitive advantage.

## Optimize and improve manufacturing procedures

Manufacturers need to constantly look for process and quality improvements. Using an integrated, closed-loop quality system enables you to manage the complexities of planning, controlling and monitoring processes and quality. You can use operational data analytics to improve your component manufacturing chain from end-to-end. Additionally, by using the IIoT alongside edge-sharing devices, your machines can seamlessly connect with one another. By securely integrating information technology (IT) and operational technology (OT) systems, you can share valuable data insights on machine output, speed, maintenance and performance for manufacturing planning. Further, by collecting data from all your machines across every production site, you gain performance transparency into numerous global production lines, manufacturing plants and supplier networks. You can then leverage this data by implementing strategic changes that incrementally improve performance to easily meet key performance indicators (KPIs). This incremental approach to improvement yields a closed-loop manufacturing system, as consistency and appropriate material handling deliver consistent speed and quality.



# Providing new opportunities with smart manufacturing

As global competition grows, it is vital to maximize productivity and avoid costly, time-consuming mistakes. By integrating Siemens smart manufacturing, you can use a digital twin and simulation tools to efficiently plan component manufacturing operations, reliably align internal and external stakeholders with the shop floor to execute high-quality products and continually improve your manufacturing operations via a closed-loop, data-based methodology.

## With these solutions, you can:

- Use a comprehensive digital twin to holistically control the entire production process for greater manufacturing accuracy, speed and efficiency
- Validate and commission component machines or lines virtually to reduce costs, save time and improve safety performance
- Integrate regulatory, quality and customer requirements with a flexible MES to easily meet key manufacturing criteria
- Synchronize production processes across departments, improving collaboration between disciplines, the shop floor and supply chain partners
- Tap into IIoT and gain greater visibility into your manufacturing operations across multiple sites, empowering you to use data for strategic business decisions
- Use data to engineer a closed-loop approach to manufacturing where data informs incremental machine improvements and yields high-caliber components



### **About Siemens Digital Industries Software**

Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing and electronic designs meet the needs of tomorrow. Siemens Xcelerator, the comprehensive and integrated portfolio of software, hardware and provides companies of all sizes with digital tools that empower new insights, opportunities, and automation to drive innovation. For more information on Siemens Digital Industries Software products and services, visit [siemens.com/software](https://www.siemens.com/software) or follow us on LinkedIn, Twitter, Facebook, and Instagram.

**Siemens Digital Industries Software** helps organizations of all sizes digitally transform using software, hardware and services from the Siemens Xcelerator business platform. Siemens' software and the comprehensive digital twin enable companies to optimize their design, engineering and manufacturing processes to turn today's ideas into the sustainable products of the future. From chips to entire systems, from product to process, across all industries, [Siemens Digital Industries Software](#) – Accelerating transformation.

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