SIEMENS DIGITAL INDUSTRIES SOFTWARE

How low code tools accelerate digital part production

siemens.com/plm/dpp

SIEMENS

In the past few years, part production has been buffeted by a host of digitally oriented trends.

Disruptive influences, solutions-driven business models, smarter factories – all these trends pose a threat for any machine shop hampered by legacy processes. Traditional part production methods can't meet these trends in the moment. To stay relevant, machine shops must adopt emerging technologies that actively respond to supply, demand and industry shifts.

One such technology is low-code and multi-experience application development, which machine shops can use to create applications that complement existing software services. A low-code platform empowers machine shops to assemble digital experiences that simplify customer and consumer engagement, automate workflows across IT, OT and ET, and accelerate the development of digital services across the value chain. It provides the speed, flexibility and resilience to digitally transform and continuously improve practices for operational excellence.

In this e-book, you'll learn about:

- The four major trends driving change for machine shops
- Challenges that machine shops face as they futureproof their plans
- Industry solutions that can overcome challenges and drive growth
- What the future can look like with low-code solutions

Industry trends:
What does the future hold?

Before machine shops can prepare their business for the future, they must understand the transformational trends at play within Industry 4.0. Specifically, manufacturing technologies have grown increasingly automated, with more and more companies adopting smart factories and digitally connected enterprise processes that leverage machine-to-machine communication and machine-to-enterprise data insights. Through this interconnected network, machine shops can share information internally and leverage analytics that bridge organizational and operational gaps. As they adapt to Industry 4.0, companies inevitably create a cycle of driving and responding to the very trends shaping the engineering, manufacturing and service operations sectors.

Trend #1

Disruptive Influences

Supply chain and staffing shortages are at an all time high due to pandemic recovery and global, geopolitical issues. Compounding this disruption are low-cost entrepreneurs: new businesses unencumbered by old methodology are entering the industrial machinery arena, using new technologies to innovate procedures and cut costs. This upset to the status quo has made it difficult for legacy companies to compete. Digitalization is key to staying relevant and overcoming resource and labor obstacles.

Trend #2

Smarter factories

With the advent of globalization, consumers have greater leverage in deciding what products they will and will not buy. To satiate changing consumer demands, machine manufacturers are generating more and more complex requirements that machine shops and component makers often struggle to meet. The need for smarter factories, ensuring increased efficiency and quality processes, has never been clearer. Smarter factories integrate hardware, software and services under one cohesive umbrella, making it possible to adjust real time procedures, material and machine variations to meet even the most complicated customer requirements. Greater use of factory automation means overcoming manual, time-consuming tasks and expediting part production, while digital training and remote service tools make it possible to continue aftermarket part services. These smart factory tools therefore provide machine shops with comprehensive business lines - a means for increased profitability.

Trend #3

Business model changes

Rising energy costs and the paradigm shift surrounding sustainability has triggered more and more industrial machinery companies to innovate their business models for greater self-sufficiency. In particular, ESG has become a core tenant of the business function; machine shops must satisfy both their own and customers' sustainability objectives, all while staying compliant with energy/ecological laws. Servitization has doubled as another facet altering traditional business models. Industry 4.0 technologies are reshaping businesses from one built around machinery parts to one focused on services and integrated solutions -- from product-centric, to solution-centric. This digital transformation underway at machine shops and component-making businesses is paving the road for a great retooling, meaning, future business opportunities for only the most innovative companies.

Challenges for the future

The confluence of these three trends creates increasingly complex challenges for machine shops. Companies must adopt greater flexibility, reliability, productivity and connectivity to stay relevant in today's digitally centered world.

Challenge #1

Agile part production

Traditionally, machine shops manually code and adjust their programmable logical controller (PLC) to begin part production. However, this methodology often leads to machining errors, as unaligned domains and outdated systems cannot readily translate data between software and hardware. Production runs take longer, while order delays jeopardize future business.

Overcoming this challenge comes in the form of automation: automating the PLC's coding means features-based machining consistency across jobs; no data translation issues means no errors, which means no order delays. This versatility, of course, comes at the expense of greater design and part manufacturing

Challenge #2

Integrated manufacturing operations

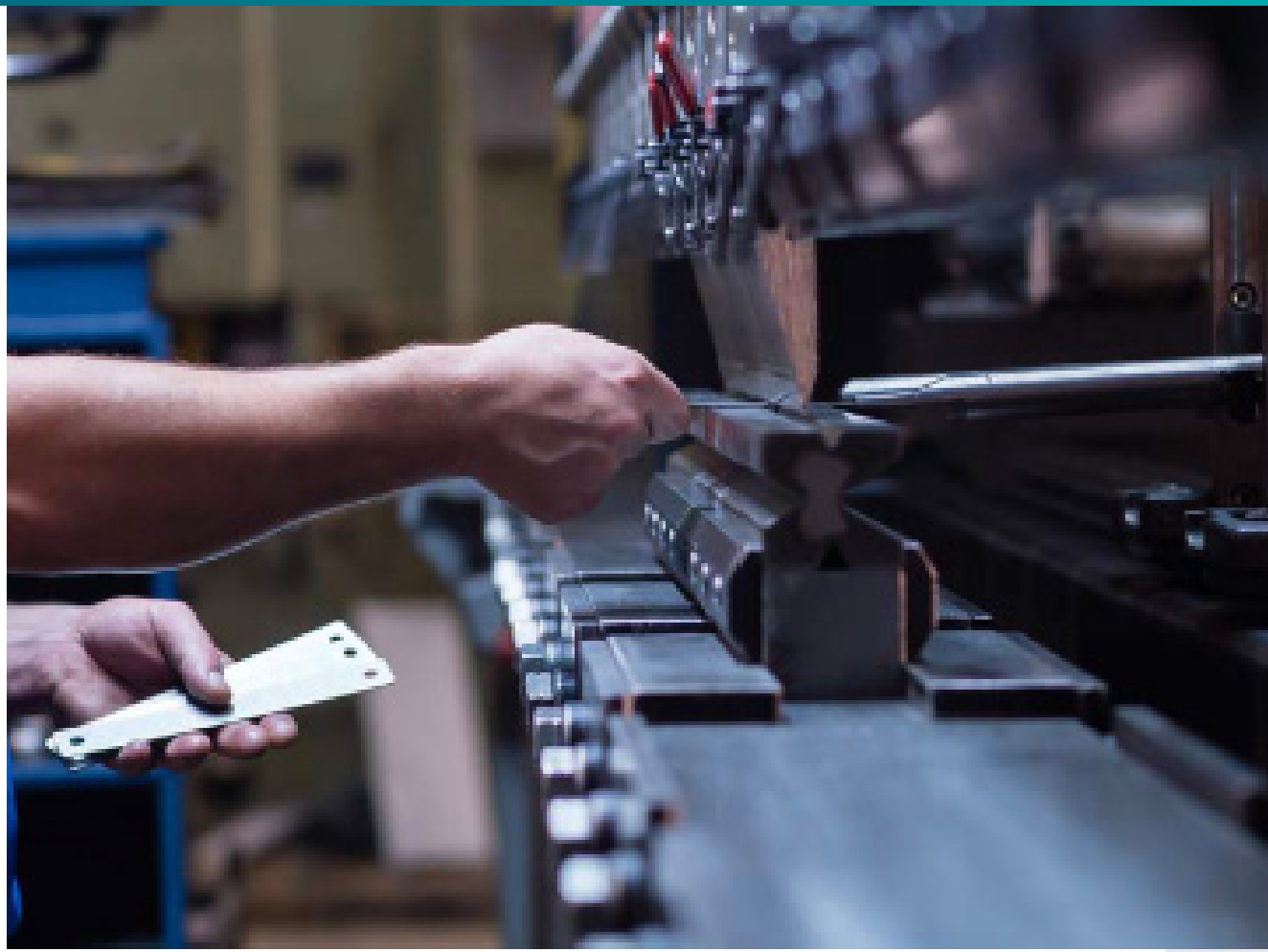
Outdated software and technological systems often mean poor integration, leading to miscommunication, errors and delays. The slower a part comes to market, the less likely a machine shop can compete against other players - speed is therefore key to ensuring profitability. Integrating digital part design, quality and production allows you to do more with less. By designing, simulating and manufacturing in a single automated workflow, you can engineer high-quality, energy-efficient parts without extra administrative overhead. Part repeatability is also possible, as projects can be duplicated and reused - driving both speed and scalability.

Challenge #3

Accelerated adoption of new technologies

More and more machine shops are challenged to create highly sophisticated geometric parts that are durable, light and sustainable. Customized parts often means smaller lot sizes, translating to high costs and low profit margins. But with new technologies, such as additive manufacturing, the digital part production business is changing.

Additive manufacturing makes it possible to 3D print highly complex parts from a wide variety of materials. Connectivity between part production software and product lifecycle management tools allow you to readily source suppliers and materials, so that supply chain shortages are never an issue. Simulation features enable part testing and redesign before a component hits production. By understanding how a part will fare under various machine and factory conditions ensures that the perfect piece is engineered to even the highest customer standards.



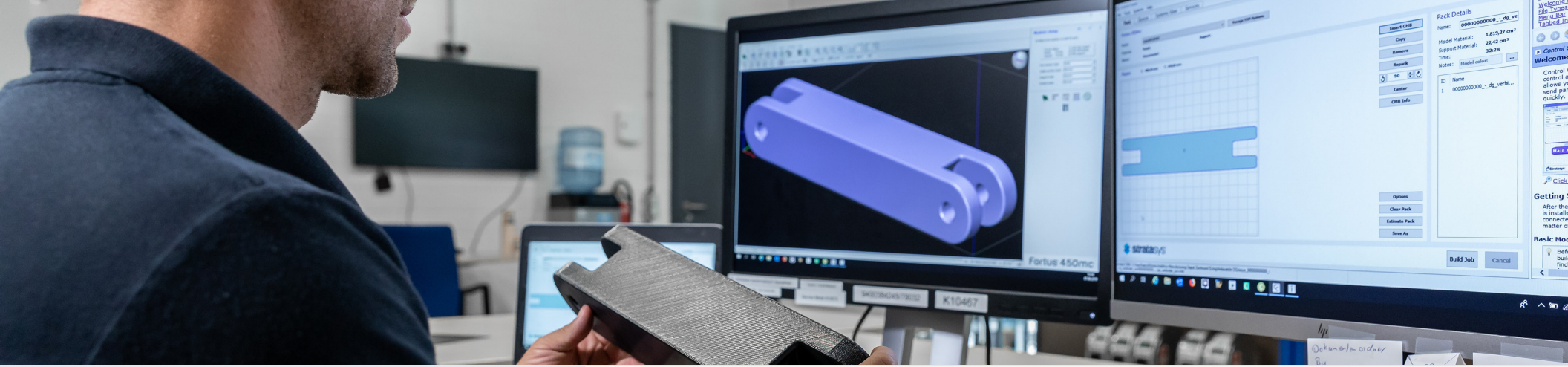
Where to focus change: Digital part production

Today's industry challenges can be summarized in one word: complexity.

By harnessing complexity into a key competitive advantage, machine shops can become an industry disruptor.

The power of technology makes it possible for anyone to:

- Bring innovative parts to market faster than the competition
- Lower development, production and operating costs
- Create new business models
- Build differentiation through insights that are not easily duplicated
- Propel digital transformation by adopting new technologies



A new tomorrow with digital part production

It is critical for machine shops and their supply chain partners to efficiently manufacture reliable, high-quality industrial machinery parts. These parts must integrate into the larger machine while meeting high tolerance and precision needs – all while maximizing production capacity. Low-code solutions can automate traditionally manual workflows that span across domains, to streamline processes and facilitate collaboration.

Low-code solutions for digital parts production

With Mendix, the low-code platform, you can develop customized business applications that automate tooling and parts manufacturing, oversee production planning and scheduling dashboards, and manage quality checks with service technicians. Further capabilities include:

Automated manufacturing procedures

Utilize low-code solutions to store and re-use digital parts production data. By using the same data across similar or repeat orders, machine builders optimize the parts production process, saving time and resources.

Streamlined production operations

Unify digital parts production operations by automating low-level processes, such as logging proposals, archiving orders, creating calendar holds for scheduling and so much more.

Enhanced quality control (QC)

Modernize QC mechanisms for enhanced efficiency. Identify what does and what does not work with existing QC systems, then implement a low-code solution to augment or replace the existing systems.

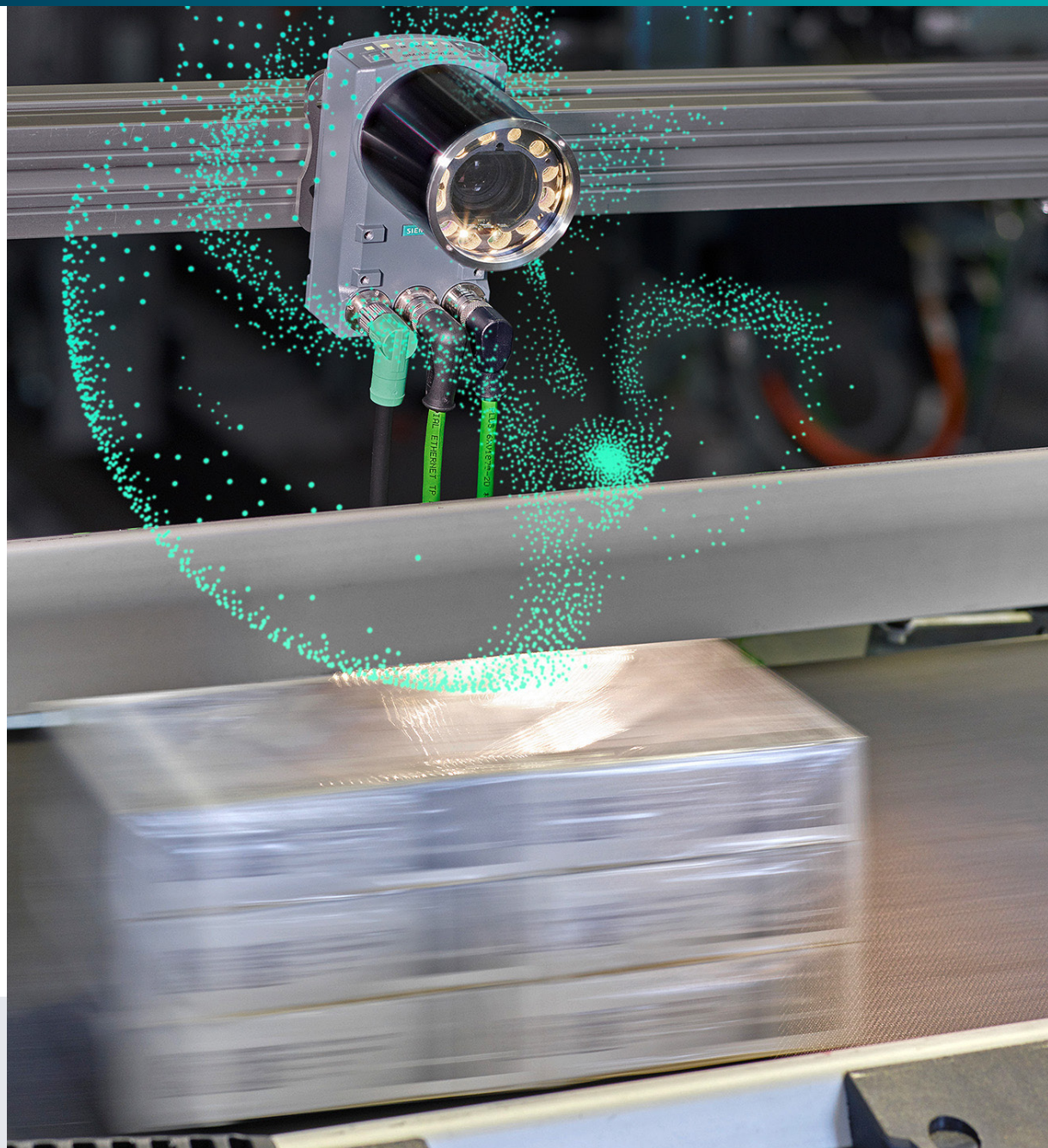
Face the future with low code

Between disruptive influences, smarter factories and business model changes, machine shops face massive challenges and must adopt new technology to keep pace with global competition. When machine shops harness the power of digitalization, complexity becomes an opportunity to improve agile part manufacturing, integrate manufacturing operations and accelerate the adoption of new tools that boost speed and productivity.

Low-code development provides the perfect foundation for machine shops to strengthen their product development and part performance capacities. It enables machine shops to take the steps necessary in their digital transformation journey, so they can meet tomorrow's challenges today.

Siemens offers the leading low-code development platform, Mendix, that integrates across a broad portfolio of engineering and manufacturing services. Learn how to master complexity and become a market leader with personalized, adaptable solutions.

Start for free.



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.

Americas: 1 800 498 5351

EMEA: 00 800 70002222

Asia-Pacific: 001 800 03061910

For additional numbers, click here.

85192-D3 5/23 A