



WHITE PAPER

# Agility for competitiveness: Transforming manufacturing operations for business agility

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## Executive summary:

The COVID-19 pandemic brought unprecedented changes to every industrial sector. Supply chain disruptions, fluctuating costs, and new consumer purchasing habits fueled a dramatic need for increased agility and resilience in the consumer product manufacturing industries. Consumers increasingly shifted from patronizing brick-and-mortar stores to embracing e-commerce and digital channels. This shift to e-commerce, though underway for the past 15 years, greatly accelerated over the course of the pandemic. According to [a recent study by McKinsey & Company](#), e-commerce sales rose “by about 35% year over year, and online penetration remains about 30% higher than pre-COVID-19 levels.” As buyers’ habits changed and they recognized the added convenience of at-home ordering, consumer expectations shifted accordingly—a shift that industry experts forecast to be permanent henceforth.

# Introduction

To date, manufacturers continue to face ongoing supply chain disruptions, including workforce-related disruptions, which continue to impact manufacturers' ability to run production plants at full capacity. At the same time, companies must adapt to pre-existing challenges, like a retiring workforce, shortage of skilled workers, and the sustainability drivers which are pushing energy, emission, and waste reduction. Designing operations for a circular economy, too, is on the horizon.

As such, manufacturing strategies have to adapt to the post-pandemic future. Former predictable consumption patterns and stable networks allowed businesses to tightly adhere to a plan for product quality, quantity, and timing—all optimized to keep the cost of production as low as possible. During the pandemic, supply chains optimized for cost efficiency and manufacturing plants optimized for steady-state Overall Equipment Efficiency (OEE) were unable to respond with resilience to supply disruption and booming online sales and the attendant service expectations.

According to a 2021 [report](#) conducted by the World Economic Forum, 56% of the 3,000 CEOs surveyed listed agility and flexibility as their top strategic priorities.

The digital transformation of manufacturing operations is a critical foundation to deliver the operational efficiency and flexibility improvements, as well as the end-to-end supply chain visibility manufacturing enterprises need in a post-pandemic marketplace.

To seize business growth opportunities and maintain competitiveness, manufacturers must incorporate robust digital platforms and toolsets to optimize their manufacturing value chain. Manufacturers must:

- Enable cross-functional supply chain visibility and collaboration to create production plans which are feasible to execute.
- Deploy advanced production planning and scheduling methods to optimize plant schedules for throughput and on-time delivery and to adapt to more frequent change.
- Digitize and standardize best practices, key performance indicators (KPIs), and reporting across their distributed network of plants.
- Leverage operational data with predictive and prescriptive artificial intelligence (AI) for continuous productivity, asset reliability, and eco-sustainability optimization.
- Create a digital thread that contextualizes information across the supply chain to provide the visibility, transparency, and traceability consumers and regulators demand.
- Establish new KPIs to measure and improve the speed and agility of their supply chains.

Watch this [webinar](#) to learn how to prepare manufacturing operations for growth, profitability, and sustainability in a post-pandemic future.



# The multi-site operations digital transformation challenge

Consumer product manufacturers' large, distributed networks require industry-specific digital strategies and tools that allow companies to leverage synergies and facilitate accelerated deployment across their multiple plants simultaneously. To be successful, multi-site digital transformation strategies require a corporate, centralized "Center of Excellence" approach to identify the best practices and supporting technologies, which can be standardized and quickly rolled out in parallel across multiple sites.

Digital twin technology provides real-time situational awareness and lays the data foundation for more advanced capabilities, like artificial intelligence (AI), machine learning, and predictive quality, process, and asset performance. By abstracting production sites in a standardized digital twin of the plant, manufacturers can transform operations consistently across many sites with varying practices for similar operational activities.

Digital twins bolster agility by enabling complete visibility into plant operations, resources, and assets and creating a much-needed dimension of what the plant network is capable of delivering. The ability to run "what if" scenarios means manufacturers can determine the best outcomes virtually.

Manufacturing execution systems continue to play a central role in this. These systems become part of a plant's living digital twin, which applications can use to blend human work tasks with automated activity in the execution of standardized processes. Digital twins enable a transformation not only in how work is performed but also in how workers collaborate.



## Danone

Danone Specialized Nutrition (Danone) realized its digital manufacturing vision to increase efficiency and flexibility. With AVEVA™ Manufacturing Execution System, the Danone team developed a core model, or template, that provides 20 standard MES functions for deployment across manufacturing sites. Because it used AVEVA's scalable solutions, the standardized template was easy to roll out across Danone's 25 remaining sites and accelerated continuous improvement. In this [video](#), Sebastien Boissier, Danone's Specialized Nutrition Digital Manufacturing Director, explains how the company used AVEVA solutions for success.

# Optimizing planning and execution through digital technology

The optimization and integration of both business planning and manufacturing execution are equally crucial for creating an agile, demand-driven business, but without real-time visibility into plant resources and capacity, manufacturers cannot ensure an operational plan is feasible to execute. Manufacturers must use digital tools to optimize production scheduling to accommodate more real-time, demand-oriented operational planning cycles and improve flexibility to pivot in the case of re-planning critical orders.

Production schedule optimization is the critical link between operational planning and the realities of the plant floor to deliver business-critical orders, on time and in full, at the lowest possible cost. Advanced planning and scheduling capabilities allow for the optimization of the production schedule around business drivers, like customer service and demand, as well as operational imperatives like material, equipment, and labor availability.

Improving the plant-to-supply-chain link gives businesses more options to respond to demand or disruption by looking holistically across the value chain. Manufacturing operations must be continuously optimized to minimize losses and flexibility tradeoffs and to adapt to sustainability mandates and the new circular economy present.

Comprehensive digital execution solutions, such as the AVEVA Manufacturing Execution System, are vital for aligning people, equipment, and operational processes with advanced digital technologies for efficient and compliant work execution, data capturing, and continuous improvement. As operational efficiency improves, so too does an operation's ability to change course swiftly in the face of disruption.



## Borg Manufacturing

AVEVA helped Borg Manufacturing (Borg) accelerate its transformation to sustainable manufacturing operations by increasing flexibility on products while keeping its next-day-delivery pledge. Borg Manufacturing integrated its automation with AVEVA Manufacturing Execution System to address the unsustainable manual stock-picking processes and manual reporting that hindered access to key data metrics. The solution helped to increase batch flexibility on products while accelerating high-quality, consistent production. Borg Manufacturing achieved improved line efficiency by 400%, increasing from 2,000 items picked per 12-hour shift to 6,000 items in four hours, and reduced wastage in warehouse production from 5% to 2%, and it provided a sustainable model for standardization, which enabled Borg to accelerate sustainable manufacturing across multiple sites.

[Learn more](#) about Borg's path to success in this success story.

# People empowerment and collaboration

While cross-functional visibility into key performance indicators, data and applications is imperative, without skilled workers and people collaboration for turning information into better and more aligned planning and execution decisions, the impact will be limited. Paper-based processes and limited access to information, training, and knowledge transfer are obstacles to responsiveness and agility that digital tools can readily overcome.

Technological advances in big data and predictive analytics, business process management, mobile applications, and augmented reality are enabling manufacturers to empower operators and decision-makers to make sense of operational data.

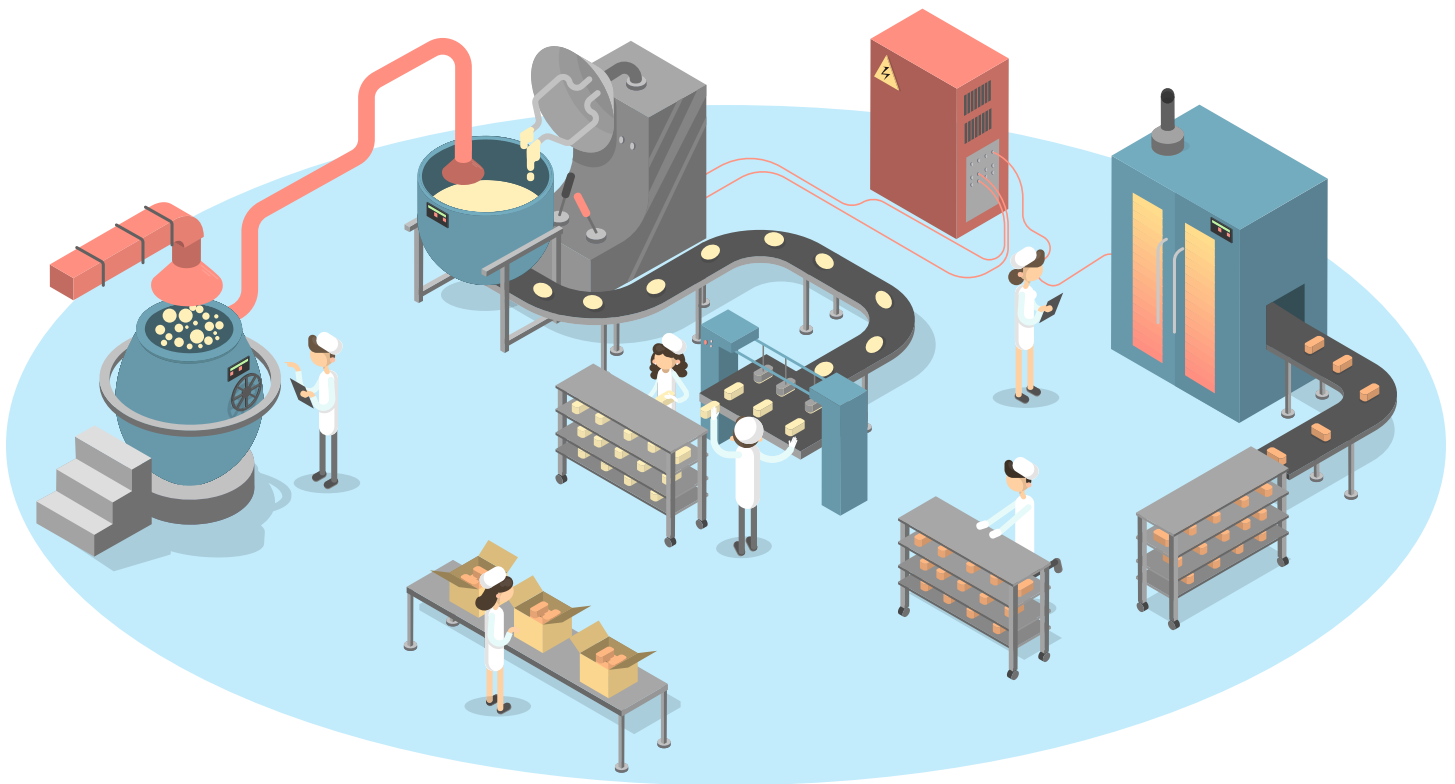
Newer platform and integration technologies like cloud, IoT, IIoT, and smart and edge devices are driving down the cost of digital transformation in the manufacturing sector.

Digital transformation incentivizes curiosity and spurs innovation, as it makes information more readily accessible to workers by connecting them to plant processes, real-time data, and one another.

A digital thread – a single, contextualized, real-time source of operational data – ensures everyone has the same information at the same time, which allows multi-disciplinary teams to collaborate on projects seamlessly, thereby improving efficiency and agility in tandem.

As the manufacturing industry faces an impending shortage of skilled workers, a problem the pandemic has only exacerbated, digital tools ensure that institutional knowledge can be retained. By digitalizing work processes, manufacturers can connect workers to instructions and easily collect data in a forms interface integrated with the manufacturing execution system.

This ensures execution goes according to scheduled product, work process, and quality specifications. And, because institutional knowledge is collected in a digital repository, resolutions to previous problems are stored. Likewise, operations can use these problems and resolutions for training and building a skilled and empowered workforce for the challenges of tomorrow.



# The future of manufacturing execution

As manufacturers begin to deploy advanced digital, improved operational efficiency and agility create a positive feedback loop, allowing them to further accelerate their digital transformations. Concepts like the digital twin and the digital transformation of work are increasingly becoming the tools to improve operational efficiency and drive the needed business outcomes at manufacturers' plants.

When manufacturing operations employ automated tools to analyze sensor-collected data, especially when coupled with the industrial internet of things (IIoT), they reduce the cost of compliance and consumer safety risks by tracking the transformation of products from raw materials to finished goods. Digital solutions contextualize information to evaluate yield, quality, resource utilization, and waste for both transparency and continuous improvement.

By leveraging operational data with predictive and prescriptive AI, manufacturers can gain continuous optimization to minimize losses and flexibility tradeoffs. AI-based analytics synthesize plant data to uncover the optimal operating conditions at any given time, then replicate the best outcomes by conveying the exact settings to use for efficient, reliable, and sustainable operations. As companies progress through their digital transformations, higher tiers of digital maturity unlock greater benefits, such as predictive analytics capabilities, which reduce unnecessary maintenance and unplanned downtime as well as quality losses and waste of resources. In today's demand-driven marketplace, reliable and predictable operational performance can be the difference between a resilient, agile stance and falling short of customer expectations.



## Henkel

Henkel Laundry & Home Care (Henkel) built a digital backbone using AVEVA Manufacturing Execution System and AVEVA System Platform to meet its sustainability and efficiency goals. When it implemented AVEVA's tools, Henkel improved supply-chain resource efficiency on the production side by 5-6% annually.

Watch the [video](#) to learn more about Henkel's success.



## The path ahead

In the post-pandemic era of industry, consumer product manufacturers' success will be defined by their ability to remain agile and resilient in the face of change and unforeseen disruptions. The increased ubiquity of e-commerce means faster production cycles and higher customer expectations are likely; not only do consumers now expect convenient purchasing and prompt delivery, but they expect full transparency into delivery times, the origin of products and raw materials, and the environmental impact of sourcing, making, and shipping.

Digital transformation turns disruption into opportunity. [According to the World Economic Forum](#), manufacturing companies leveraging digital technologies to transform their operations end to end, have reduced costs by 5-30%, increased productivity by 5-40%, and have achieved substantial agility and sustainability improvements. Producers who do not embrace digital technology could fall behind, whereas those who begin their digital transformations early will sharpen their competitive edge.

### About the author

Michael Schwarz is the Product Marketing Senior Manager for manufacturing execution software at AVEVA. With over 25 years of industry software sales and marketing experience he is passionate about how technology helps to solve problems and can improve quality of life. Michael holds a graduate degree in electrical engineering from the Bergische Universität Wuppertal, Germany.

For more information on how AVEVA can help to optimize your manufacturing value chain, visit the [AVEVA Manufacturing Operations Management webpage](#) or to talk with one of our experts please contact us at [aveva.com/en/contact](https://www.aveva.com/en/contact)