



Market Insights Paper

ACCELERATING MANUFACTURING MODERNIZATION IN A POST-PANDEMIC WORLD

Perspectives on transforming the supply chain for greater business resilience, customer centricity and operational performance.



INTRODUCTION

From big data to analytics and the Internet of Things, digital transformation is disrupting every aspect of the way manufacturers operate. Market leaders who embrace this change will come out on top. Those slow to react – whether they're industry giants or niche players – will be left behind and may struggle to survive.

Winners are harnessing the power of cloud and application technologies to become more agile and operate more efficiently. They're leveraging emerging technologies to deliver compelling customer experiences and launch innovative new services, as well as creating new business models to scale, grow, and stay ahead of the pack.

This paper looks at the evolution and drivers of modern manufacturing and the capabilities organizations need to embrace to get out in front. We also examine the way in which Capgemini is applying its own industry-relevant offerings through real-life use cases, to help clients thrive in a fast-paced and increasingly volatile market.

INDUSTRY TRENDS/ EVOLUTION

The manufacturing industry has consistently undergone significant change since the 18th century. The 21st century is proving no different. Here's a quick snap-shot of the evolution of the industry up until now.

1700's

The late 1700's marked the beginning of modern bulk material handling with an automatic flour mill that used an elevator, screw conveyors, belt conveyors, and other devices.

1800's

The 1800's brought interchangeable parts, and the Industrial Revolution. We saw coal power and machine production, the first American steam locomotive, and the American System of Manufacturing.

1900's

The 1900's introduced the first moving assembly line, with the Model T car manufactured in the United States. Concepts like Lean Manufacturing, Just in Time, and automation were adopted.

2000's

More recently, we are seeing the rise of Industry 4.0, or the fourth Industrial Revolution with digital transformation and major changes in how customers interact with companies.

Currently, we are living in an exciting time of Industry 4.0, where the advancement of new technologies such as the Internet of Things (IoT), augmented reality, cloud computing, and additive manufacturing are being mirrored by customers seeking out more personalized products and the preference to shop, where they can select from a larger assortment of SKUs.

Companies on the forefront of manufacturing modernization are embracing these new technologies to overcome several supply chain challenges that we discuss below.

THE RIGHT CAPABILITIES TO OVERCOME CHALLENGES

To fully embrace Industry 4.0, manufacturers must overcome several supply chain challenges. Significant issues, such as unplanned downtime, difficulty collaborating with sub-contractors, data validity and its effects on predictive analytics or forecasting, lack of automation, and more, are prevalent and forcing manufacturers to digitize the supply chain.

The pandemic has necessitated 'contactless' non-touch interfaces and interactions, leading to manufacturers having to up their game by offering fully digitized customer experiences powered by highly advanced augmented reality and AI technologies.

Manufacturers must build in sufficient flexibility to protect against future disruptions, and satisfy more demanding customers. However, many IT systems are often expensive to run, inflexible and over-reliant on legacy technologies. In response, they will need to implement Industry 4.0 strategies using cloud-enabled technologies to modernize, minimize supply chain disruptions, and keep up with demand.

We believe there are four major characteristics manufacturers should strive for when setting their manufacturing modernization strategy:



Responsiveness and resilience

The pandemic has proven that manufacturers need to adopt smart technologies that help them withstand volatile market conditions. They require a robust framework that includes responsive and resilient risk management capabilities, underpinned by technology platforms that support applied analytics, artificial intelligence, and machine learning.



Visibility and transparency

Better oversight, control, and more informed decision making are now table stakes for organizations that want to get out in front and accelerate out of the pandemic. This requires end-to-end visibility and transparency across the supply chain. In the long-term, risk response will need to become an integral part of business-as-usual protocols.



Agility and customer-centricity

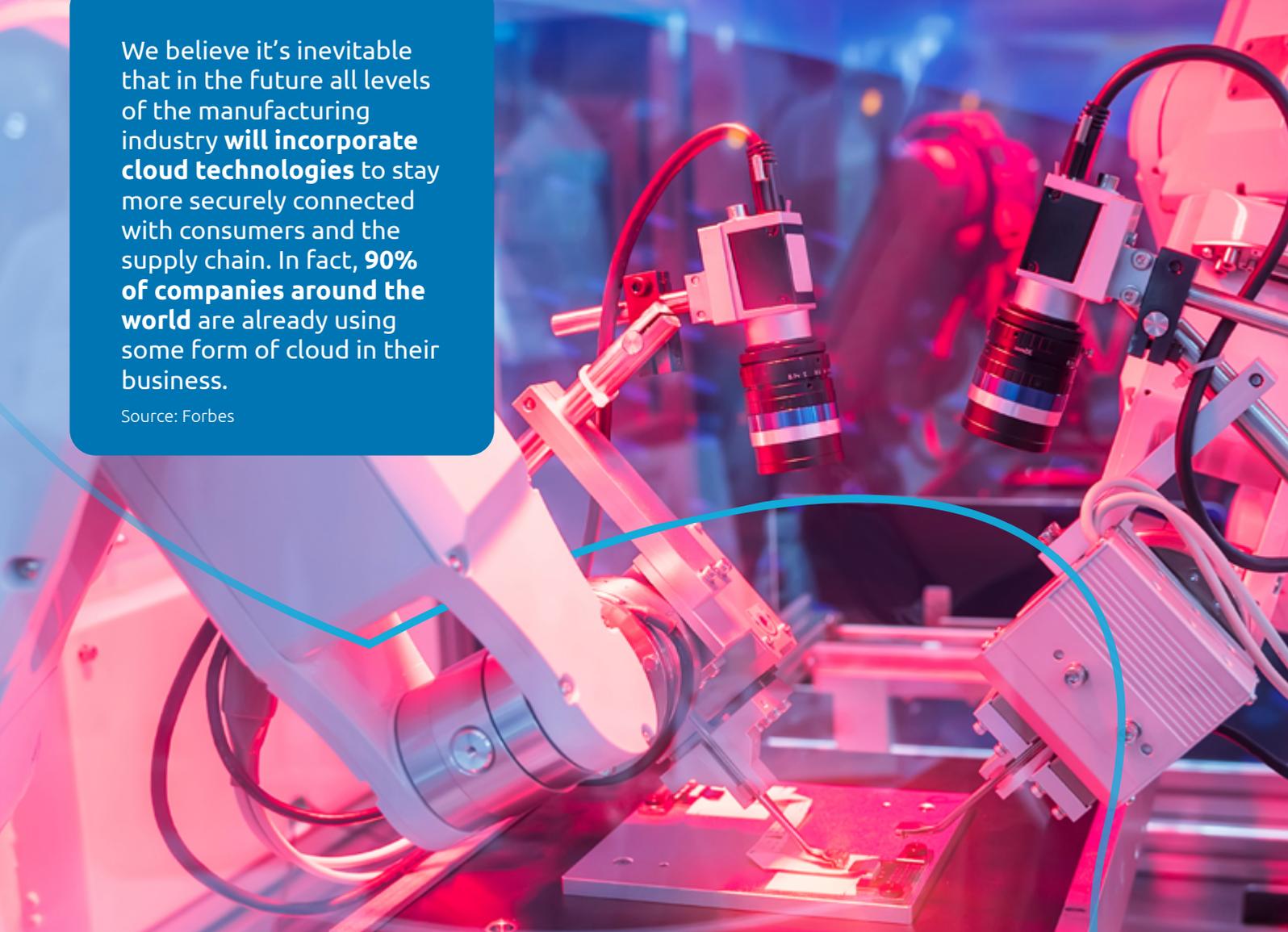
It's important to adopt agile technologies that can quickly allow factories to produce customer-relevant products as opposed to being inflexible, constantly producing the same products while struggling to pivot due to outdated legacy technologies.



Automation and efficiency

We foresee an increased reliance on automation across the supply chain. Automation minimizes the need for human interaction, providing tangible efficiencies. Plus, it helps maintain social distancing and enables the reallocation of human capital to other parts of the business.





We believe it's inevitable that in the future all levels of the manufacturing industry **will incorporate cloud technologies** to stay more securely connected with consumers and the supply chain. In fact, **90% of companies around the world** are already using some form of cloud in their business.

Source: Forbes

AREAS OF FOCUS FOR POST-PANDEMIC MODERNIZATION

In the next section, we consider five important areas of focus that manufacturing leaders need to modernize as a priority, so they can survive in a post-pandemic world.

1. Overcoming supply chain constraints
2. Availability and readiness of data
3. Remote manufacturing management
4. Supply chain collaboration
5. Stock and inventory strategies

AREAS OF FOCUS

1. OVERCOMING SUPPLY CHAIN CONSTRAINTS

Whether due to a lack of raw materials or lack of human workforce, the industry has experienced an abundance of supply shocks, leading to constant disruptions in finished goods and customer deliveries. These challenges have been compounded by the pandemic which necessitated safe-distancing measures, staggered worker attendance, and restricted migrant-labour movement within, and between, countries.

Manufacturers must modernize using robust Supplier Management processes that reduce the risk of raw material or goods shortages. These processes should be underpinned by a digitized supply chain that can harness large amounts of data to monitor demand shifts, communicate with key suppliers, mitigate supplier risks and disruptions, and increase supply chain transparency and visibility.

CAPGEMINI CASE STUDY

At Heathrow Airport, a fully integrated end-to-end Source to Settle solution was implemented with Supplier Management at its heart. It utilized the Oracle Supplier Portal, Sourcing and Supplier Qualification Management modules of Oracle Fusion Cloud with the processes configured to provide a proactive and connected approach to Sourcing and Suppliers. This resulted in a streamlined process enabling a standardized approach to supplier onboarding, qualification, and re-qualification, reducing the time and effort required by all parties.

AREAS OF FOCUS

2. AVAILABILITY AND READINESS OF DATA

More and more data must be gathered and analyzed by suppliers. This is being driven by consumers' ever-changing demands and desire for personalization, combined with manufacturers' need to pivot production towards certain high demand / low-cost products due to unemployment or general uncertainty in the population. In addition, the pandemic resulted in a profound shift of consumer behavior and distorted the data feed of many analytical models, causing some to stray from the predicted norm that the patterns of the past will likely repeat in the future.

To address these challenges, manufacturers need to overcome the limitations of traditional forecasting algorithms, simplistic statistical tools, and sole reliance on internal data. Transforming with the cloud will help them do just this. With the right platforms, data can be collected and analyzed all in one place and accessible to everyone who needs to be on the network. Manufacturers—and everyone in the supply chain—can analyze and view this data with sophisticated algorithms to quickly gain the best possible understanding of their customers, so they can satisfy demands and keep up with trends.

CAPGEMINI CASE STUDY

At Heathrow Airport, Capgemini implemented a modern BI platform enabled self-service data visualization, advanced analytics and data mashups using Oracle Analytics Cloud. We have also implemented similar solutions for some of our other aerospace customers looking to gain deeper insights, at pace, across their ERP and Supply Chain functions.

AREAS OF FOCUS

3. REMOTE MANUFACTURING MANAGEMENT

With social distancing still being practiced and fewer skilled resources available, it is more important than ever to have contingency plans for a shortage of human capital in factories.

Remote manufacturing and the use of automation is the perfect way to deal with labour shortages. These types of solutions are particularly useful in warehouses and factories. They include shuttle systems, automated material-storage and retrieval systems, smart shelves, smart picking robots, automated and intelligent sorting, picking, and packing systems, along with drones to perform inventory inspection.

Other Industry 4.0 solutions can assist warehouse workers as well, including augmented-reality tools that make picking multiple orders at one go much easier and more effective, and exoskeletons to reduce injury from repeated heavy-material handling.

Manufacturers can take things a step further with digital twins. They can help design optimal warehouse operations, creating a digital duplicate of a warehouse to understand the results available from different digital technologies.

Manufacturers with large customer service departments should consider investing in digital tools to automate customer service. Using online forms, chatbots, or fully remote customer support staff to answer customer questions and respond to complaints can lower costs and improve the customer experience. This is especially important for manufacturers that sell Direct to Customer (DTC) and potentially have tens of thousands of customers. Additionally, manufacturers building out their DTC capabilities from scratch may go directly to a digital customer service model, which may be cheaper and more scalable than building out a whole department.

PUTTING THINGS IN PRACTICE

Oracle's connected smart factory helps manufacturing companies better predict and resolve maintenance requirements, correlate quality issues to machine and environmental factors, and reduce downtime. Leveraging a modern cloud platform, IoT connectivity, big data analytics, predictive intelligence, and cloud supply chain tools, Capgemini's Manufacturing Advantage solution helps companies to modernize their production and supply chain processes to competitively meet current and future requirements.

4. SUPPLY CHAIN COLLABORATION

Core elements of manufacturing and supply chain planning have traditionally been conducted in silos, with demand forecasting, supply planning, production planning, logistics planning, and sales and operations planning (S&OP) all handled by separate teams. However, interrupted global trade flows and value chains have forced companies to break the silos to improve end-to-end visibility. As a result, the potential impact from optimized planning is more evident. But it also requires a more sophisticated analytical approach, and collaboration across multiple functions and stakeholders.

Manufacturers should consider autonomous planning as a solution. It relies on artificial-intelligence and machine-learning algorithms, which are supplemented not only by internal data, but also by external datasets from suppliers, customers, weather forecasters, demographic sources, and broader economic indicators. Incorporating these additional variables helps organizations respond to changing dynamics and external shocks more effectively. Advanced analytics can also optimize planning across the entire value chain in a way that wasn't feasible under a siloed approach with traditional analytical tools.

Deferred adoption is more likely for solutions that require higher capital expenditure and have unclear or long-term payback periods. Examples include blockchain, nanotechnologies, and the most advanced automation systems. In the more immediate term, companies can deploy digital solutions beyond the four walls of a manufacturing plant, reaching across the end-to-end value chain to address planning (and replanning) challenges related to disruptions at suppliers or production plants, operational challenges in managing workplace health risks, and delivery challenges posed at transportation modes or in warehouses.

PUTTING THINGS IN PRACTICE

Oracle Cloud platforms with Capgemini's Intelligent Supply Chain Offers and IP provide manufacturers with the ability to collaborate more effectively with customers on designs, allow customers and suppliers to provide feedback, and allow everyone on the network to work on a common platform.

AREAS OF FOCUS

5. STOCK AND INVENTORY STRATEGIES

As bulk-buying and stockpiling become more common, and possibly a permanent fixture of consumer behavior, manufacturers may find that their current inventory strategies are ill-suited to meet consumer needs. Manufacturers that only rely on just-in-time inventory, for example, will need to consider whether to shift to a just-in-case strategy. Just-in-case inventory strategies are ideal when there is a risk of running out of a product.

Manufacturers should evaluate their current inventory system and determine whether their current strategy can accommodate potential bulk-buying and stockpiling that would outpace their supply. If these behaviors remain permanent, they will need to rework their stocking strategies to maintain adequate supply to keep up with demand. Consistent shortages could mean lost revenue from customers, which might motivate them to reconsider their supplier relationships.

CAPGEMINI CASE STUDY

Capgemini have implemented Oracle Advanced Supply Chain Planning, Manufacturing and Inventory solutions for customers in the Aerospace and Defence (A&D) industry, enabling them to streamline and consolidate their stock into a single, global inventory management solution for material in every stage of the product lifecycle providing greater visibility across the supply chain. The solution also provided full product traceability utilizing serial genealogy inside the four walls and complemented by blockchain outside.

MANUFACTURING ADVANTAGE

As we can see, market uncertainties require manufacturers to transform their current supply chain operations, so they can be more resilient to sudden supply-demand changes, drive greater innovation, deliver process efficiencies, and improve product quality.

To achieve these benefits and overcome complex legacy systems, many organizations are turning to Industry 4.0 tools and technologies underpinned by a cloud-centric model. However, a major challenge lies in the need to heavily customize these solutions to address industry-specific needs, and the costs associated with doing so.

That's where Manufacturing Advantage comes in. Capgemini's Manufacturing Advantage is a packaged Oracle-based solution that contains plug and play components designed specifically for the vertical needs of the manufacturing industry.

Capgemini's Manufacturing Advantage delivers up to 60% savings in blueprinting with an industry-specific reference architecture. In turn, this results in up to 40% savings with best-practice processes configured and documented, along with up to 30% savings with test case operations support templates. And when compared to a traditional approach, it delivers a 30% decrease in the time of implementation.

It consists of a preconfigured cloud platform with standard business processes and industry specific templates that simplifies the system architecture, so that it can be stood up at speed with reduced cost, allowing your important resources to spend more time on innovation and driving growth.

The underlying platform is enhanced with Capgemini accelerators and Capgemini digital IP that underpin a broad scope of out-of-the-box manufacturing processes (engineer to order, make to stock, make to order, and configure to order). It also provides the foundation for additional functions such as Additive Manufacturing, Connected Factory and Digital Twin mechanisms—with further value for integration, analytics, and digital assistants.

The solution creates an agile, next-generation platform that's simple yet comprehensive and will evolve with customers' growing needs. It allows clients to anticipate market conditions and customer needs, and continuously transform to deliver even better business performance by exploiting intelligent technologies



RISK MITIGATED JOURNEY

Our Manufacturing Advantage Solution is supported by Capgemini's Cloud Delivery Services, which provide efficiency and acceleration throughout the life of your transformation program.

Capgemini's deployment approach consists of 6 phases, beginning with Project Preparation. At this stage, the project plan is reviewed, the value stream is walked through, and the workshop schedule is reviewed. The system install also begins at this time.

This phase is followed by the Design Confirmation phase, during this time the business processes and organization structures are configured, the blueprint and process flow diagrams are updated, and the security requirements are outlined. All design and planning is completed at the end of this stage.

Build begins directly after that, where all configurations are finalized, and custom development is performed. This development is followed by unit testing and establishment of the QA environment. Data formatting and test loads are also performed before moving onto the next phase: testing.

The testing phase includes integration testing and data validation. All output documents are finalized in this phase, and a thorough cutover plan is established. There is also a mock cutover that is performed to ensure a smooth transition before the final prep phase.

Right before Go-Live, final preparations are made with data migrations and end-user training. A Go-Live Readiness Assessment is completed along with postproduction support planning. Once Go-Live is complete, ad hoc support is provided for any user issues along with proactive system monitoring.





CONCLUSION

Companies can take steps to mitigate future issues and get ahead of the curve in modernization. Capgemini's Intelligent Supply Chain offerings including Manufacturing Advantage can provide manufacturers with the technology needed to keep up with consumer demand, increase transparency with customers, analyze data, and lower technology downtime.

With an unmatched depth of digital transformation, industry and Oracle technology expertise, Capgemini provides you with a well-designed strategy that will help you transform your digital supply chain and transition to cloud keeping in mind your manufacturing requirements.

GET IN TOUCH

We hope you found our Market Insights Paper useful. Please get in touch with one of our experts to find out how we can help you on your journey to accelerating manufacturing modernization in a post-pandemic world.

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