



THREE CLOUD MANUFACTURING TRENDS FOR SUPPLY CHAIN RESILIENCE

How manufacturers can improve collaboration and operational visibility through data-driven business insight

EBOOK

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THE IMPORTANCE OF DATA IN THE CLOUD

Manufacturers are constantly seeking ways to manage complexities, navigate evolving global landscapes, mitigate uncertainty, and increase customer value.

Ongoing disruption to global supply chains— such as when the [Suez Canal blockage held up to \\$9.6 billion \(€8.8 billion\) of goods a day and companies lost as much as \\$400 million \(€367 million\) an hour](#)—has made it harder to overcome these challenges.

No manufacturer can completely insulate themselves from external events affecting their operations. But with the right data, they can be forewarned and take action to mitigate the impacts of disruption.

Cloud migration is the first step to getting the insights manufacturers need to reduce the impacts of this kind of issue.

Adopting cloud services and technologies builds supply chain resilience, enhances partner collaboration, and improves operational visibility through data-driven business insight.

The journey to the cloud also presents several opportunities for innovation and growth. But achieving all this requires cloud technologies and service providers to work with the best manufacturing ERP systems.

In this ebook, we'll explore the challenges facing manufacturers, the top three cloud manufacturing trends essential for building resilience during supply chain turbulence, and how the right providers can help you make the most of these technology trends.

THE CHALLENGES OF LEGACY SOLUTIONS

THE COST OF DOING NOTHING

While cloud migration presents many financial and operational challenges, the cost of doing nothing far outweighs the investment.

To operate successfully in today's climate of ongoing turbulence, manufacturing organizations need high levels of visibility, collaboration, and agility across their enterprises and throughout their supply chains.

Yet, many manufacturers still rely on legacy systems with disconnected, on-premises solutions and siloed data environments. These often include multiple ERPs, either homegrown or from a range of different providers, like SAP.

This creates many problems for executives and data teams in large manufacturing organizations.

RESPONDING TO RAPID CHANGE

Disparate systems make it labor-intensive to gather, process, store, analyze, and share data from enterprise-wide applications and external sources. This makes it difficult, if not impossible, to extract real-time, actionable insights which drive business decisions in response to rapid change.

Rigid systems and siloed solutions also make it hard to share data effectively, both within the organization and across its subsidiaries and supply chains. The result is restricted collaboration, less resilience, and limited innovation.

Legacy systems used in isolation prevent organizations from capitalizing on emerging technologies; they slow down digital transformation before it can even start. For example, they hinder manufacturers' ability to use the vast amounts of data available to them to identify new revenue streams and build products that meet changing customer expectations.

When businesses are unable to create meaningful value out of data repositories, they limit their visibility, agility, and operational efficiency. Ultimately, all these restrictions can lead to reduced turnover, lower profits, slower growth, and loss of market share to more digitally enabled competitors.

THE CHALLENGE OF CREATING MEANINGFUL VALUE FROM DATA FOR SUPPLY CHAIN DIGITAL TRANSFORMATION

- Just 39% of manufacturing executives report that they have successfully scaled data-driven use cases beyond the production process of a single product, says the World Economic Forum.¹
- More than 50% of organizations have not yet actively started to build a road map for supply chain digital transformation, according to Gartner.²
- 95% of companies will have failed to enable end-to-end resiliency in their supply chains by 2026, predicts Gartner.³
- On-premises systems limit insight, so what other approaches should manufacturers consider to make the most of their data?

TREND 1: CLOUD MIGRATION

INCREASING EFFICIENCY, FLEXIBILITY, AND SCALABILITY—DESPITE DISRUPTION

Cloud migration is a crucial step in any manufacturer's digital transformation journey. While many technology innovations were first implemented in the manufacturing sector—such as ERP, CAD, programmable tools, and industrial robotics—the industry has been **late to the party with cloud computing**.

The benefits of cloud services have been widely reported, and manufacturing has much to gain. Accessing services such as computing power, storage, and databases on a consumption basis is already helping an increasing number of manufacturers to control and reduce costs and risk.

Whether they're using infrastructure-as-a-service, platform-as-a-service, or software-as-a-service solutions, adopting cloud services helps increase efficiency, flexibility, and scalability—all vital during times of disruption.

MAXIMISING THE VALUE OF DATA

Crucially, cloud migration helps manufacturers in every market and every part of the world to maximize the value of their data. Cloud services can help teams collect, process, and store data from a variety of physical assets and modern and legacy systems in a single source of truth.

They can ingest data from ERP systems, such as SAP S/4HANA, and bring information from orders, sales, and shipping sources into the forecasting and supply chain management processes.

The cloud instantly gives manufacturers a quick on-ramp to Industry 4.0 technologies like Internet of Things (IoT), digital twin, and connected products to power smart factory use cases. This means they can create new revenue streams by delivering innovative offerings for customers.

All of this generates new opportunities for further productivity, agility, innovation, and growth—within the organization and along the supply chains it serves.

THE VALUE OF CLOUD MANUFACTURING

- **€2.73 trillion—the global value of cloud by 2030, according to McKinsey Digital.**⁴
- **Large enterprises aspire to have roughly 60% of their environment in the cloud by 2025.**⁴

Cloud helps manufacturers with the following:

- **Control and reduce costs and risk**
- **Increase efficiency, flexibility, and scalability**
- **Improve productivity, agility, innovation, and growth**
- **Create new revenue streams**
- **Access Industry 4.0 technologies and models like smart factories**

TREND 2: CLOUD-ENABLED SMART FACTORIES

THE OPPORTUNITIES OF EMERGING TECHNOLOGIES

Cloud migration creates a wealth of opportunities for manufacturers. It allows them to capitalize on emerging technologies like machine learning (ML), artificial intelligence (AI), automation, IoT and other Industry 4.0 innovations like digital twin and smart factories.

WHAT IS A SMART FACTORY?

In a smart factory, equipment, machinery, and production systems are all connected within a single, automated ecosystem. Data is continuously shared from smart products like IoT sensors across the plant's assets.

Smart factories are part of the **smart manufacturing** concept designed to help optimize overall equipment effectiveness (OEE). As well as IoT, it involves data extraction and structuring tools, edge computing, data lakes, and ML services.

Because data is available in real time, smart factories allow operations managers to monitor equipment performance and anticipate maintenance problems, reducing downtime and extending the asset lifecycle. Predictive maintenance also contributes toward sustainability goals by reducing waste and energy consumption.

In turn, increasing asset performance and availability helps the factory improve productivity and elevate product quality while lowering costs. Overall, the smart factory model helps global enterprises improve production processes and enable innovation as part of their digital transformation journey.

SMART FACTORIES AND INDUSTRY 4.0 AS PART OF A DIGITAL TRANSFORMATION JOURNEY

Smart factory use cases

- Production and process optimization
- Digital twin simulation
- Predictive maintenance to maximize uptime
- Quality assurance

Industry 4.0 trends

- Machine-as-a-service
- Digitally "executed" manufacturing
- Data as an enabler
- Sustainability

Industry 4.0 can unlock significant value across multiple areas of a factory network, according to McKinsey & Company⁵:

- 85% forecasting accuracy improvement
- 15–30% labor productivity increase
- 30–50% machine downtime reduction

TREND 3: CENTRALIZED DATA MANAGEMENT

PLACING TRUST IN A FLEXIBLE DATA CLOUD PLATFORM

Centralized data management is essential for improving organizational and supply chain resilience, as well as creating effective smart factories.

To operate successfully in a world of rapid change, manufacturers across all industries can no longer rely on ERP solutions in isolation; many leaders are also placing their trust in a scalable, flexible, and secure data cloud platform.

SHARING DATA TO IMPROVE DECISION-MAKING

Today's most advanced data cloud platforms make it easier to unite siloed data from numerous sources, such as shop floor systems, IoT sensors, and ERPs, providing a single and seamless experience across multiple public clouds.

They give manufacturers the power to securely share governed data within their ecosystem of trading partners, suppliers, customers, and other supply chain and logistics operators to make better decisions, faster. And centralized analytics help organizations assess everything from supplier risks and energy costs to transportation variables and general asset management.

With new digital feedback loops mined from IoT and consumer insight data, there's an opportunity to create new revenue streams and the next generation of products and services while optimizing product performance.

With the right data platform, manufacturers can mine massive data sets to improve yield, quality, and enterprise-wide visibility.

BLENDING INTERNAL AND THIRD-PARTY DATA TO CREATE NEW PREDICTIVE INSIGHTS

Modern, centralized cloud platforms can also combine data from smart factories with external data sets to transform predictive analytics and what-if scenario planning.

By combining production and factory insights with external transport routes, weather, and geographical data sets, manufacturers can get a complete understanding of risk across the entire supply chain, end to end.

With this comprehensive understanding of internal and external factors, manufacturing leaders can make the most informed decisions to mitigate risks, improve production efficiency, and brief supply chain partners on potential disruptions long before they impact revenue.

A CENTRALIZED CLOUD DATA PLATFORM HELPS MANUFACTURERS IN MANY WAYS:

- Seamlessly connect product data layered with third-party and partner data to understand post-sales product quality and inform R&D
- Collaborate on data and applications with key partners to enhance supply chain visibility and improve decision-making
- Benefit from near seamless and secure cross-cloud data sharing to improve capacity and inventory planning—improving inventory levels and positioning
- Access third-party data to minimize the impacts of supply chain disruption while balancing costs
- Access secure, governed third-party data sets—including consumer insights and global/local economic statistics—to enrich forecasting and planning
- Use AI and ML capabilities to enable critical use cases like supply chain control tower and spend analytics
- Improve ESG monitoring and partner selection to gain greater supply chain sustainability
- Enhance customer service and increase uptime with better customer SLAs
- Lower cost of goods sold, expand service margins, and increase revenue
- Improve profitability through detailed cost and inflation variability

DIGITAL TRANSFORMATION IN THE CLOUD WITH AMAZON WEB SERVICES AND SNOWFLAKE

BRINGING IT ALL TOGETHER

An increasing number of manufacturers are moving to the cloud by making the most of AWS services and infrastructure and Snowflake's platform.

HOW AWS SIMPLIFIES MANUFACTURING

Many manufacturers are migrating their mission-critical line-of-business workloads from core ERP systems like SAP. They use AWS cloud for SAP data ingestion so they can reach the cloud quickly and focus on improving business operations and driving innovation while reducing costs.

AWS provides compute, storage, ML, analytics, and security, as well as a suite of purpose-built manufacturing services and solutions. This makes it easy to build and tailor data strategies by securely storing, categorizing, and analyzing data in a single, centralized repository.

AWS cloud solutions can also power Industry 4.0 use cases, like smart factories, and help improve production. Pay-as-you-go microservices and serverless computing models decrease the cost of running connected plants or smart product programs and allow manufacturers to instantly scale workloads up and down as operating conditions and market forces shift.

For manufacturers, that also means near-real time predictive analytics which generate actionable insights for fast, informed decisions. And it means overall higher OEE, service levels, product quality, and supply chain efficiency.

And AWS' data center and network architecture is built to meet the requirements of the most security-sensitive organizations. By automating otherwise manual security tasks, AWS cloud services help teams shift their focus to scaling and innovating the business—without compromising cybersecurity.

AWS: THE LEADER IN CLOUD COMPUTING TO MANUFACTURERS

- More than 80% of Fortune 500 companies are powered by AWS cloud infrastructure, says Investguiding.⁶
- 96% of customers running SAP workloads on AWS reported a reduction in total cost of ownership and average overall savings of 26%, according to an IDG white paper via AWS.⁷

HOW SNOWFLAKE IMPROVES SUPPLY CHAIN RESILIENCE

The Snowflake Manufacturing Data Cloud empowers manufacturers to collaborate with partners, suppliers, and customers to improve supply chain performance, product quality, and factory efficiency.

By running Snowflake on AWS, manufacturers can securely share their factory data with suppliers and logistics companies, and easily connect their internal data with external data sets.

They can also access additional third-party shared data sets and data services through the Snowflake Marketplace to get insights into weather forecasting, trade route activities, and other external factors that could disrupt operations.

By blending internal data with third-party datasets in a single Data Cloud, manufacturers can transform their predictive analytics to operate more effectively, boost agility, and significantly reduce their risk profiles.

BETTER TOGETHER

Creating meaningful value from data is a fundamental differentiator, but it isn't always straightforward. Even the most digitally savvy manufacturing enterprises are still working to overcome this challenge.

Snowflake on AWS helps manufacturers tackle major business challenges along the value chain—from warehouse, logistics, and delivery, to field services, technicians, installers, and even the product itself.

These cloud solutions can support organizations everywhere to optimize operational efficiency, support value-add activities, and unlock new business models and revenue streams.

Combined expertise, solutions, and support from leading cloud data providers helps manufacturing businesses gain the insights they need to inform decisions that improve visibility and resilience across their supply chains.

THE COMBINED POWER OF ERP DATA ON AWS AND SNOWFLAKE

- Gain insights from connected products
- Integrate data from fragmented, siloed ERP systems
- Maximize production uptime
- Offer remote maintenance services
- Use digital channels to get closer to customers
- Avoid supply chain disruptions

LEARN MORE ABOUT ACCELERATING BUSINESS EFFICIENCY WITH SAP DATA IN THE CLOUD

Watch the webinar:

[Accelerating Business Efficiency with
SAP Data in the Cloud.](#)





ABOUT SNOWFLAKE

Snowflake enables every organization to mobilize their data with Snowflake's Data Cloud. Customers use the Data Cloud to unite siloed data, discover and securely share data, and execute diverse analytic workloads. Wherever data or users live, Snowflake delivers a single data experience that spans multiple clouds and geographies. Thousands of customers across many industries, including 573 of the 2022 Forbes Global 2000 (G2K) as of January 31, 2023, use Snowflake Data Cloud to power their businesses.

Learn more at [snowflake.com](https://www.snowflake.com)



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CITATIONS

¹ bit.ly/41jQVoc

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