snowflake®

8 WAYS MANUFACTURING COMPANIES IMPROVE SUPPLY CHAIN RESILIENCE, BOOST YIELDS, AND GAIN EFFICIENCY WITH THE DATA CLOUD

MANUFACTURING SUCCESS GUIDE

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SUPPLY CHAIN
TURBULENCE

The past few years may be etched in the minds of manufacturing professionals for a long time. Disruption has become the new norm as supply and distribution lines have been impacted by the global pandemic, geopolitical conflict, and an uncertain economy. In the U.S., single points of failure in supply lines have had weaknesses exposed as never before, **with 40% of all U.S.-based imports arriving in either Long Beach or Los Angeles, California**. Add the **Suez Canal blockage in 2021 with $9 billion of goods stuck and companies losing as much as $400 million an hour**, and it's no wonder that this industry has awakened to the need for increased supply chain resilience, collaboration, and data-driven business insight.

Fortunately, there are bright spots in all the turbulence—neither business nor innovation slowed down despite these global pressures. The value of Industry 4.0 seems to have been validated, **as 94% of companies interviewed by McKinsey Consulting** indicated that this framework helped keep operations running during the crises of recent years. The resilience and innovation of those using or quickly moving into Industry 4.0 with its emphasis on AI/machine learning, smart automation, and data-driven insight and collaboration suggest that maybe the troubles of the past few years have indeed moved us into a better future.

Leading manufacturers are increasingly adopting the cloud to maximize the value of their data. In doing so, they are best positioned to embrace Industry 4.0 and the massive growth of Internet of Things (IoT) devices— with 35B devices connected globally, it's a critical capability that allows manufacturers to be more connected with consumers than ever. Organizations capturing these data streams can unlock new sources of revenue as well as transform how they innovate, build, and deliver new offerings for customers.

MANUFACTURERS, IT'S TIME TO
BECOME TRULY DATA-DRIVEN

What was once an opportunity for breakthroughs in yield, time to market, innovation and automation is now an imperative. Companies able to share data can simply make better decisions faster—whether in their supply chain, partner ecosystem, or logistics and freight strategies—it's all next-level when informed by AI/machine-learning insight.

Snowflake's Data Cloud™ makes it easier to combine and correlate data from multiple disparate sources, such as shop floor systems, sensors, applications, and IT systems to increase manufacturing visibility, power Industry 4.0, and smart manufacturing analytics. With new digital feedback loops mined from IoT and consumer-insight data, there's opportunity to create new revenue streams and the next generation of products and services. Read on to find out how Snowflake customers are optimizing product performance through access to high-volume, connected (IoT) data and service history.

#1 SUPPLY CHAIN CONTROL TOWER

THE CHALLENGE

Data-driven insight means faster and better decision-making, yet many manufacturers are limited by the constraints of their data infrastructure. Current supply chain data must be timely to be useful, yet many companies lack accurate insight into their inventory because data is siloed and difficult, if not impossible, to share across departmental or supplier lines. Legacy infrastructures simply can't scale to support the levels of business insight needed to accurately forecast and manage the supply chain today.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud helps companies easily leverage both internal and supply chain data to power analytics needed for managing inventory, logistics, and product development—all based on a consumption model that means you never pay for what you don't use. Near-instant, elastic scalability of compute and storage means companies can realize incredible operational efficiencies with a modern, multi-cloud architecture that breaks down legacy silos while delivering AI/machine-learning insights in near real-time and across the business. With the Snowflake Marketplace, customers gain access to valuable manufacturing data sets to power analytics for new levels of insight.

CUSTOMER SPOTLIGHT

SIEMENS
Healthineers ⁖

HEADQUARTERS   Erlangen, Germany
INDUSTRY   Medical technology

Snowflake on Azure enables Siemens Healthineers' IT to design their data architecture with cross-regional access and easy, centralized management. The company leveraged Snowflake technology to establish a data mesh of globally distributed data lakes for improved performance and enhanced functionality of worldwide data sharing and distribution. Siemens Healthineers was able to reduce maintenance, offer near-unlimited capacity to users, and ingest data from various departments as well as external sources.

Today, data processing jobs filter and merge the data within Snowflake, which provides reusable, raw data marts or domain-specific data sets. Business and data analysts can then use this data to gain deeper insight and optimize and automate processes. Snowflake enabled Siemens Healthineers' IT to reduce maintenance requirements, save time and money, and achieve better performance by removing various bottlenecks such as bandwidth limitations. A faster ETL process is just one of the results; today a table with more than 260 columns and over 3 million records unloads in only six minutes.

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#2 SAP
DATA INGESTION

THE CHALLENGE

Manufacturers require accurate, timely ERP data to perform vital business functions, to report, measure, and alert on operations, finance, procurement, and sales activities, to name a few. Manufacturers often have multiple ERPs, either by design or by inheriting this structure through mergers and acquisitions, often not all from the same provider, raising the priority on integration and enterprise-wide visibility to support operations, manufacturing, and supply chain activities. In addition, companies must proactively manage supply chain risk based on data integrated from external sources, such as macro-economic consumer trends, weather, and changes in roads or shipping routes, as well as the full range of ERP functions that provide data from the point of sale to the factory floor. Companies cannot rely on an ERP solution such as SAP by itself; they need a scalable, flexible, and secure data platform that allows data sharing to make the best decisions for the business.

SNOWFLAKE'S SOLUTION

The Data Cloud makes it easy to share data with partners, suppliers, customers, subcontractors and service organizations, so everyone has access to near real-time data in a secure and governed way. This allows companies the speed and flexibility they required to understand supply and demand and proactively manage their supply chain and logistics functions. Manufacturers gain visibility into their upstream and downstream supply chain through direct data sharing and the Snowflake Marketplace, where live data can be accessed and securely shared. Analytics facilitate the assessment of supplier risks, energy costs, transportation variables, and general asset management. With Snowflake, manufacturers can mine massive data sets to improve yield and quality and easily ingest data from SAP to bring data such as orders, sales, and shipping information into the forecasting and supply chain management processes.

#3 DATA SHARING

THE CHALLENGE

The ability to break down data silos is critical to enabling digital transformation. When companies share data across departments and subsidiaries, it changes the conversations internally and with customers and helps to drive new levels of innovation. When companies can further extend that data to their supply chain and partners, another level of digital transformation begins to occur. And when companies access data sets from those in their industry who deal with similar challenges and opportunities and share that across their organization, the next level of transformation opens up new horizons. Yet for most, the challenges to unlimited data are many, including bandwidth restrictions, outdated architectures, and cultural norms, to name a few.

SNOWFLAKE'S SOLUTION

Companies can increase revenue by unlocking value from previously siloed data with Snowflake's secure data sharing capabilities and the **Snowflake Marketplace**. Data scientists then use this data set to generate actionable insights. With Snowflake Data Cloud, customers can perform analytics and share data economically based on our consumption-based pricing model. Thanks to Snowflake Secure Data Sharing, teams can quickly share a database or a table with other teams in the organization.

Snowflake's Direct Share capability enables account-to-account sharing and frees up more time for innovative work. Inside the Data Cloud, organizations can unite their siloed data, easily discover and securely share governed data, and execute diverse analytic workloads, providing a single and seamless experience across multiple public clouds.

CUSTOMER SPOTLIGHT

purple

HEADQUARTERS	Lehi, Utah
INDUSTRY	Retail

Purple turned to Snowflake's comprehensive data platform to eliminate back-ordering and ensure fulfillment after signing on new wholesale partners and introducing three additional mattress models. Snowflake's database integrates smoothly with common data platforms allowing Purple teams to understand fresh data and quickly make business decisions. Data is collected and reported from a single source, connecting the company's marketing, production, and customer service departments that were previously siloed.

Learn More

> **Snowflake enables us to tie together data from numerous sources on purchase orders, inventory, and manufacturing, as well as collaborate on data in virtually real time with partners like Albertsons, all in one place for end-to-end supply chain visibility that leaves zero ambiguity in our business. Snowflake has been vital to Kraft Heinz digital transformation and is enabling us to now focus resources on innovation for our customers."**
>
> **—JORGE J BALESTRA,**
> Global Head Machine Learning Operations (MLOps) and Platforms, Kraft Heinz Company

Snowflake's Data Cloud provides a modern data infrastructure that lets manufacturers enable core functions, such as inventory management, while gaining near real-time visibility into business performance and improving forecasting. The Data Cloud delivers granular and timely insights to predict demand and optimize inventory, manufacturing, and fulfillment. Manufacturers are also able to easily share data without copying or moving it, increasing privacy and security control. With Snowflake's Data Cloud, companies can access their inventory and sales data in near real-time and enrich this data with regional insights about customers and other factors that may influence demand. As a result, they can make smarter inventory allocation decisions and drive fulfillment innovation. With the Snowflake Marketplace, robust demand forecasting, which requires integrating second- and third-party data from the supply chain, is possible. Finally, manufacturers can ingest critical real-time information such as trends in weather, geopolitical events, and their workforce to understand cross-industry macro-trends that are essential in predicting supply chain disruption and driving supply chain efficiency.

CUSTOMER SPOTLIGHT

Kraft Heinz

HEADQUARTERS	Chicago, Illinois
INDUSTRY	Food processing

Kraft Heinz is in the midst of a digital transformation that will enable it to speed innovation, react faster to changes in the market, and further their mission to "make life delicious" for their customers. Kraft Heinz evaluated their options based on the key criteria of high, on-demand scalability, support for multiple public cloud providers, and the platform's ability to drive greater agility, speed, and performance. The Data Cloud met these criteria and added an important additional benefit: it is easy for users to access and consume data from third-party sources, boosting the ability of Kraft Heinz's data scientists to innovate and add strategic value to the business. The Snowflake Data Cloud now handles a half trillion records running on Microsoft Azure in a scalable and flexible data hub that easily supports new digital transformation projects for Kraft Heinz. Data scientists can experiment with ML-informed models that calculate optimal safety stocks—the amount of inventory needed on hand to ensure that orders can always be met.

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#4 IMPROVE YIELD

THE CHALLENGE

As global demand grows, the challenge to improve yield never ceases. Companies need strategies to continue increasing production while striving for operational excellence and cost management. With manufacturing processes relying more on automation and IoT—in the form of sensors that may indicate a malfunction, for example—the amount of data generated by today's factory floors easily soars into the terabytes. Companies require a way to gain business insight in near real-time and monitor performance at scale.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud offers a scalable, efficient way to manage massive amounts of data with operational efficiency. Offering a true multi-tenant, data agnostic, and multi-cloud solution, Snowflake enables companies to manage high volumes of concurrent queries that may soar into the gigabytes or even terabytes, all easily managed from one highly scalable platform for near real-time insight into operational data. Snowflake enables companies to handle data from multiple private clouds with secure, governed access to all forms of data—structured, unstructured, and semi-structured.

#5 LOGISTIC AND FULFILLMENT

THE CHALLENGE

Many factors put pressure on global manufacturers to improve their logistics and fulfillment operations. All companies strive for operational efficiency, a dynamic balancing act between supply and demand that creates fluctuations in delivery timelines and the logistics of getting product where it needs to go on time. Meanwhile, IT teams seek to minimize the time they spend managing infrastructure so they can be enabling the business to deliver greater value. The reality is, many companies struggle to accurately predict demand, resulting in supply chain headaches, delays in fulfilling orders, or challenges in getting products to customers in a timely manner. These challenges are not new, but the volatility of the past few years has heightened the necessity for accurate data, flexible capacity, and greater agility.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud enables AI/machine-learning to drive greater levels of business insight all from a consumption-based model that permits companies to scale infinitely and near on-demand while gaining operational efficiency. Snowflake helps manufacturers gain the agility required to adapt to fluctuating demands from today's global consumers and better manage the omnichannel fulfillment necessary to get products delivered for high levels of customer satisfaction. With Snowflake, companies gain accurate visibility into supply chain and order fulfillment data, and can share that data with partners and across departmental and organizational lines, bringing a common view and greater visibility to logistics and fulfillment operations.

CUSTOMER SPOTLIGHT

CEMEX

HEADQUARTERS   Monterrey, Mexico
INDUSTRY   Building materials

The Cemex IT team struggled to manage their legacy on-premises data warehouse system and was unable to provide customers with the self-service data warehouse it desired for greater operational efficiency. The global building materials company required a dedicated team in each region (Mexico, the United States, South/Central America/Caribbean, Europe, Asia/Middle East/Africa) to manage the data warehouse infrastructure, consuming time and resources that would be better used for more strategic initiatives. Month-end reporting was time-consuming and inefficient, with simultaneous reporting creating bottlenecks.

Snowflake provides CEMEX with virtually unlimited storage on demand. In the past, adding capacity required weeks or months for the IT team to acquire, configure, install, and manage hardware. Cemex pays based on consumption, which allows them to have full visibility into operations and costs. Snowflake has helped manage the customer data used by the company's collections team. In the past, several people were required to manage data about customers with overdue invoices. With Snowflake, CEMEX has reduced the number of people managing the data, and information is updated faster.

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#6 AFTERMARKET FIELD SERVICE

THE CHALLENGE

Companies need data from the field to perform a variety of critical business functions, such as monitoring the health and locations of their fleet vehicles, gaining insight into critical assets that require continuous maintenance like wind turbines, and possibly, the effective installation of their product or service. IoT is a vital part of this chain of communication, whether data from hand-held devices from delivery people, automated sensors and data submitted by fleet vehicles, or even the product itself, such as a refrigerator.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud is a key component in delivering aftermarket field service for many of our manufacturing customers. Working with private and public clouds, including Microsoft Azure and AWS, Snowflake's Data Cloud accepts structured, unstructured, and semi-structured data from IoT devices and field personnel as easily as it accepts data from anywhere else in the supply chain. Snowflake helps optimize the value of field assets that submit data through IoT devices by layering in more context, such as weather information or service availability. Some customers are sharing data with others in their supply chain ecosystem to broaden visibility, and others have developed their own data applications to provide aftermarket services. Snowflake has a Powered by Snowflake partner program that enables application developers to build, operate, and grow their applications on Snowflake.

CUSTOMER SPOTLIGHT

mobility

HEADQUARTERS Risch-Rotkreuz, Switzerland
INDUSTRY Transportation

Prior to Snowflake, Mobility's SQL-based system could not accept semi-structured data; now, fleet operations are optimized with one set of data that can be analyzed and shared for an excellent customer experience and a more efficiently managed fleet. With Snowflake, Mobility can set up alerts to inform fleet managers if a vehicle or location is particularly above or below average, and take action based on that. Each car sends a set of semi-structured data every few seconds. With Snowflake, Mobility can finally store and analyze this anonymized data.

Given Snowflake's existing partnership with ThoughtSpot, their near-unlimited scalability, and native support of semi-structured data, the Snowflake Data Cloud ticked all the boxes for Mobility. The data refresh was reduced from 24 hours to just three—before that, the team had invested countless hours in constantly optimizing the database; with Snowflake, it ran that fast right away with near-zero maintenance. Even better, the entire process from proof of concept to going live with Snowflake took just six weeks.

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#7 FINANCIAL REPORTING

flexport.

HEADQUARTERS	San Francisco, CA
INDUSTRY	Logistics

THE CHALLENGE

Companies require end-to-end visibility for accurate and timely financial reporting; from purchase order (PO) creation to customer delivery, manufacturing organizations must effectively ingest and analyze large amounts of supply chain data. And for the many who deal with data silos that prevent effective analysis of data, lack of business insight could delay reporting and risk falling out of compliance with various regulations locally, regionally, or globally. Finally, without a unified and timely way to handle all the data necessary for financial reporting, companies struggle to provide the AI/machine learning models to business users and partners that really deliver the insight required to continue driving innovation.

SNOWFLAKE'S SOLUTION

The Data Cloud delivers a single, unified platform from which users can view data across product and customer lifecycles. It assists in financial reporting by delivering a single source of truth and efficiently managing the data needed to meet stringent regulatory reporting requirements and compliance audits. Snowflake enables customers to share data in a secure and governed way, allowing financial reports to be shared across departments with all users updated in near real-time. Companies can reduce their month-end close times and easily meet other reporting requirements with Snowflake ingesting and managing data from systems across the supply line as well as common ERP solutions such as SAP.

Successfully implementing Flexport's data mesh strategy with Snowflake has led to a healthier product development process that considers data as a product—not a byproduct. Analytics engineers are now essential members of Flexport's development teams and partner with product managers, engineering managers, and software engineers to successfully design, launch, and govern data products. Decentralization makes it easier for Flexport to identify potential data issues and ensure data quality.

Data governance with Snowflake, through the principles of data mesh, provides Flexport greater scalability and confidence to democratize access to trusted data. The Data Cloud streamlined Flexport's data engineering workloads while Snowflake Marketplace has made it easier to find and leverage third-party data sets. Flexport can now better manage and benefit from data on their 10,000 clients and suppliers who rely on its software for logistics and supply chain expertise.

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#8 IOT
DATA INGESTION

THE CHALLENGE

Every opportunity brings its challenges. IoT opens up a vast new world of connection with products, services, and most importantly, customers. With the ability to send and receive data throughout the entire value chain—from warehouse, logistics, delivery, field services, technicians, installers, and sometimes the product itself—companies can be laser-focused on adapting their supply chains to a level not possible just a few years ago. The issue is that this relatively new innovation of IoT data overwhelms many legacy IT systems and even challenges more modern cloud-based architectures with diverse data types, particularly semi-structured and unstructured, that they may not have had to handle until recently.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud handles IoT data not as an afterthought, but by design. The Data Cloud easily ingests all data types—structured, semi-structured, and unstructured—and presents it all in a unified platform so users across the supply chain can operate with high degrees of insight and agility. Snowflake delivers data in a secure and governed way to enable data sharing throughout the supply chain and offers solutions such as the **Native Applications Framework** (currently in private preview) and Snowpark, Snowflake's developer framework, that help manufacturers easily develop data applications for IoT; some are even monetizing these apps in the Snowflake Marketplace. The ability to integrate IoT data with ERP and external data such as weather or market statistics can improve decision-making with and across functions and drive additional visibility into organizations. Gaining full insight through IoT into operations in the factory and field has enabled predictive maintenance for many, which can help keep critical machine assets up, running, and in front of any potential downtime.

CUSTOMER SPOTLIGHT

KOMATSU

HEADQUARTERS   Milwaukee, WI
INDUSTRY   Mining and metals

Komatsu's data platform began as a small, on-premises web application. After migrating to Snowflake, it's become a consolidated, enterprise-wide data and analytics platform of IoT data from 20 major equipment types and hundreds of machines globally. The platform has 127 tables in production, 40 terabytes of data, and 4 trillion rows of time-series IoT sensor data. The IT team was also having to create custom reports, a costly and time-consuming situation that quickly became unmanageable.

Komatsu implemented the Snowflake Data Cloud to address all these issues; offering elastic scalability and a near zero IT administrative burden, Snowflake's data warehouse component allowed for the consolidation of data from across the enterprise. Komatsu's "store and forward" method, in which files containing up to 50,000 unique sensor points from hundreds of IoT equipment types, are now loaded into Snowflake.

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CONCLUSION

Burdened with siloed and fragmented data, many manufacturers are struggling to build resilient supply chains and make data-driven decisions across their businesses. Snowflake delivers a centralized, integrated data repository that powers business decisions by bringing together data from factory floor, supply chain, inventory management, product development, distribution, and logistics, often right through delivery to the consumer.

Snowflake's Data Cloud provides the elastic scale needed to tackle manufacturers' toughest challenges while augmenting analytics with external data. The Data Cloud allows the integration of internal sources, such as ERP, HR, shop floor, and marketing, to combine with your ecosystem partner's data to power breakthrough levels of innovation and efficiency. Customers can tap the Data Cloud for the use cases illustrated here and much more by including partner and marketplace data sets to improve decision-making.

With the Snowflake Data Cloud, manufacturers can gain access to near real-time data in a multi-cloud environment, delivering scalability and agility as never before. No more overprovisioning compute and storage to accommodate seasonal spikes; Snowflake's pay-by-consumption delivers all you need when you need it. With Snowflake's Data Cloud, customers gain more granular data and a powerful, scalable engine to power advanced analytics and improve operational efficiency, maximize profitability, and minimize costs.

For more information on how you can use Snowflake to unlock the power of manufacturing data, visit **Snowflake for Manufacturing**.

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 510 of the 2022 Forbes Global 2000 (G2K) as of July 31, 2022, use Snowflake Data Cloud to power their businesses.

Learn more at **snowflake.com**