

# BEING DATA DRIVEN IN THE MANUFACTURING INDUSTRY — A GLOBAL VIEW





## Introduction

The manufacturing industry has heavily influenced much of our lives for a very long time. Manufacturing organizations have also needed to adapt fast due to pandemic-induced and other global events disrupting production and supply chain disruptions. Multiple national and international lockdowns brought to light previously concealed vulnerabilities, and magnified existing ones across the industry.

Such disruptions have encouraged organizations to step up when it comes to resiliency, collaboration, and use of data to keep businesses afloat, while also striving to gain a competitive edge. Faced with ever-increasing volumes of data, the future leaders of the industry will undoubtedly be organizations which can cohesively pull all data and workloads together in a unified data cloud architecture.

This executive summary takes a deeper analysis of the manufacturing industry based on insights from our 2021 "[Cloudera Enterprise Data Maturity Report: Identifying the Business Impact of an Enterprise Data Strategy](#)".

The key takeaways from the research are as such:

- **Customer-centricity, resiliency** and **product lifecycle visibility** are top of the agenda.
- The manufacturing industry reports a large variety of **innovative analytical methods** and **next generation tools** used to support innovation and gain competitive edge.
- Organizations are adopting **enterprise data strategies**, and report areas of much needed improvements to optimize their data.
- Organizations that leverage **Enterprise Data Cloud capabilities** create opportunities for new business frontiers in a hybrid world.

## Customer-centricity and product lifecycle visibility are key in the manufacturing industry

It goes without saying that the pandemic had a notable impact on supply chains and manufacturing operations as we once knew them. In a post—pandemic landscape, using data is crucial to not only establishing and maintaining a competitive edge, but to optimize operations and meet customers' needs, in an ever—growing customer-centric world. Labor shortages due to lockdowns and concerns over employee safety have caused production and shipment delays, and subsequent drops in customer satisfaction. Also, today's customers want varied products in a short period of time. This is driving organizations to be resilient and customer centric to deliver what customers want at the right time.

Data analytics can help organizations understand and optimize the customer experience while aiding with service assurance. By employing advanced analytics and machine learning (ML) across the value chain, organizations have a clear view of repeating patterns and can achieve improved and more efficient product development, supply chains and production capabilities. ML in manufacturing allows organizations to bridge the gap between machines and humans, with humans having the ability to interact with machines, even from a distance. This is something critical in the industry, particularly when thinking about localized manufacturing sites such as distribution centers and warehouses. IT/OT convergence helps customers to improve manufacturing enterprise visibility enabling operational excellence.

Understanding the customer and product lifecycle visibility are core focus areas for manufacturing organizations, with customer and prospect data (64%), market data (59%), connected product data (58%), and supply-chain data (58%) being the most used data sources.

While the changing behaviors of both customers and therefore products, provide increasingly complex data, new opportunities to meet customer needs emerge. This is particularly important across the industry to give organizations a unified view of their customer and product data across the business and within departments. This is further reiterated by those that use data and analytics to improve the customer experience and satisfaction (61%) — engaging with customer centric data sources will pave the way for organizations to be able to improve the overall experience.

As well as improving the customer experience, reducing risks (61%) and gaining a competitive edge (55%) are other areas organizations currently use data and analytics for. Manufacturers can enable a range of powerful use cases by harnessing data and applying modern analytics, such as throughput optimization and predictive maintenance, to reduce business risks and increase competitiveness. Data and analytics will allow organizations to optimize their product scheduling, sales forecasting, reduce costs, and increase profitability with customers.

Organizations also demonstrate engaging with several stages across the data lifecycle process. Data collection (72%), security and governance (69%), and data enrichment (61%) are the main areas utilized in this context. Data digestion and monitoring at the Edge, as well as data pipeline processing are of course essential in this context; with the sheer volume of data organizations will be expected to manage on a frequent basis.

Manufacturing velocity is also critical to operations, in terms of how fast materials under process are moving towards a dispatchable state. It's positive then, that around a third (31%) of IT decision makers (ITDMs) have completely achieved leveraging solutions optimized for speed and access across on-premises and cloud infrastructure.

## Innovative analytical tools and methods are a priority when it comes to data management

The manufacturing industry reported a large variety of innovative analytical methods and tools used, such as the Internet of Things (IoT) (65%), Artificial Intelligence (AI) and machine learning (57%), data science collaboration tools (53%), and data warehouse modernization (53%).

The use of innovative analytical tools such as these can optimize manufacturing operations, improve product quality and allow for predictive maintenance. These capabilities in turn can drastically reduce downtime. Identifying problems, predicting when equipment needs maintenance, and pre-emptively servicing equipment before problems occur is critical — particularly when considering how organizations across the industry further strive to gain traction in the market<sup>1</sup>.

Furthermore, innovative tools and methods enable remarkable economic and societal advantages. Being able to adapt to ever-changing demands such as those seen following the pandemic is essential. Witnessed supply chain disruptions such as demands for cleaning supplies was something the industry wasn't quite prepared for. Such innovative tools can enable organizations to get a head start and mitigate risks before they occur.

AI has several applications across manufacturing such as smart production, factory automation, order management, and automated scheduling. It's therefore promising that organizations indicate being on a journey which involves AI and machine learning in the context of their operations.

Manufacturing organizations are adopting these innovative analytical methods and tools for the following reasons:

- **To effectively collect, manage and analyze vast volumes of data across multiple sources and locations to make better and faster informed business decisions.** More than half (57%) of senior decision maker (SDM) respondents across the industry report that their organization requires data in real-time to make business critical decisions.
- **To enhance delivery of real-time business insights.** The vast majority (90%) of surveyed ITDMs report the valuable nature behind delivering real-time business insights through technologies such as AI — which we're already seeing in terms of analytical tools and methods currently used. This is particularly useful in being able to detect signs of mechanical wear and degradation before they're visible to factory staff, to act before a failure occurs and impacts production.
- **To support self-serve reporting analytics such as AI.** Organizations' progression towards the monetization of data is reflected by their current abilities to support self-serve reporting analytics. Almost seven in ten (68%) ITDMs report they have at least somewhat achieved providing all relevant business groups with access to centralized analytics tools and support suited for their own analysis and reporting needs. From their own perspective, more than three in ten (34%) surveyed SDMs report completely achieving this self-serve capability.

<sup>1</sup> - <https://www.cloudera.com/content/dam/www/marketing/resources/solution-briefs/>

## The critical nature of effective enterprise data strategies in manufacturing

Most SDMs (87%) and ITDMs (84%) across the industry report currently having enterprise data strategies in place. Manufacturing organizations want to do more with their data and having enterprise data strategies in place pushes them one step further towards having good quality data at their fingertips. As previously uncovered, the use of data and analytics can not only optimize supply chains, manufacturing operations and the customer experience; but can also feed into marketing, sales, and service.

More than two fifths (45%) of ITDMs also recognize their current enterprise data strategies as very effective, with the remaining proportion of surveyed respondents in the manufacturing industry reporting improvements to be made. However, almost all (98%) surveyed ITDMs from manufacturing organizations also report a realm of challenges when it comes to their current enterprise data strategies, demonstrating a notable need to improve to get the most out of such strategies:

- **The high cost of management solutions** is a key challenge for more than four in ten (46%) ITDMs, and as such, without having the ability to fund these solutions, businesses will be lagging in terms of optimizing data management. This, paired with growing data volumes many within the industry are experiencing, creates a snowball of further challenges.
- **Lack of effective processes and systems in place.** With growing data volumes (40%), and difficulties migrating workloads across cloud and multi-cloud environments (36%), comes a lack of effective processes and systems in place (35%), and poor—quality data (31%). It goes without saying that organizations that currently experience these challenges will not be getting the most out of their data to improve the customer experience. These numbers also highlight the importance of data governance, where an established system comprising people, processes and technology ensures the proper and consistent handling of data across the organization.
- **Growing data volumes.** Almost six in ten (56%) ITDMs within the industry also report that their organizations are not coping extremely well with the volumes of data they're expected to manage — further evidence of where pinch points are currently experienced. This in turn has a knock-on effect on other coping abilities with data. Similar trends are seen when assessing organizations' ability to cope with the trustworthiness (62%) of data, the frequency (59%), variety (55%), and arguably most importantly, the ability to use data to inform business critical decisions (52%). The manufacturing industry is required to make business critical decisions daily. Without being able to cope with the data that they're faced with, it's virtually impossible to make the best, informed decisions moving forward.



## Organizations that leverage Enterprise Data Cloud management capabilities create opportunity for new business frontiers in a hybrid world

The way that data, infrastructure, and work is to be managed in the future will be hybrid. Organizations are planning to move further towards hybrid multi-cloud to better manage data and support its workforce in the near future. This gives organizations the agility that they desire, particularly when thinking about the need to process data quickly and efficiently across several different environments.

To achieve these outcomes with their data, businesses are increasingly moving their workloads to the cloud. Cloud enables better integration across business operations and supports an agile business intelligence model. This is essential in the interests of improving risk management, gaining quick customer insights, and seeking opportunities ahead of competitors. Managing the end-to-end journey from absorbing raw data at the source and creating autonomous decision making enables manufacturing organizations to drive actionable insights and value.

More than two fifths (41%) of ITDMs surveyed across this industry have reported an increase in spend across supporting changing work environments (e.g., hybrid working). There has also been an increased spend since the start of the pandemic in supporting digital transformation initiatives (47%), such as hybrid multi-cloud architecture, and data and analytics solutions.

The hybrid future outlines the need for hybrid, multi-cloud data architecture (known as enterprise data cloud). Most (91%) ITDMs agree that organizations that implement a hybrid architecture as part of its data strategy will gain a competitive advantage. Supported by a set of integrated capabilities, an Enterprise Data Cloud can help organizations navigate in the heterogeneous landscape.

However, there are several areas in which organizations could be doing more to get the most out of this:

- **Refining new business models.** Organizations could also be doing more to evaluate and optimize processes to refine new business models that emerge from data and analytics routinely and formally. This is an area where SDMs also report room for their organizations to improve. Just being able to recognize at least one new revenue stream or business model from data and analytics could see organizations boost their position in a highly competitive market.
- **Leveraging solutions optimized for speed and access.** ITDMs report gaps here across on-premises and public/private cloud infrastructure — a capability which is essential in terms of being able to combine, manage and transfer data for business insights.
- **Access to centralized data and analytics.** Both ITDMs and SDMs indicate a need to improve when it comes to access to data and analytics to generate insights through analysis and reporting. This is something which will be holding manufacturing organizations back in terms of being able to respond most effectively to product development needs, operations, supply chain and marketing strategies.
- **Optimizing security practices.** Having the necessary enterprise-grade standards in place for security, back-up and disaster recovery across all environments is critical, and an area where organizations should strive to better themselves. Around nine in ten (91%) SDMs and ITDMs (90%) agree that having secure, centralized governance and compliance over the entire data lifecycle is extremely valuable when handling and managing data. What's concerning is recognition that business divisions haven't completely achieved this capability, and without all departments within the organization being aligned in this area, there's likely to be security gaps which could be detrimental to the business.

**Manufacturing organizations' current capabilities in relation to the Enterprise Data Cloud:**

ITDMs in the manufacturing industry [325]	Completely achieved	Not completely achieved	SDMs in the manufacturing industry [169]	Completely achieved	Not completely achieved
Leveraging solutions optimized for speed and access across on-premise and public/private cloud infrastructure.	31%	69%	We maintain a performance measurement standard for applying data services to our operations, at speed.	37%	62%
All relevant business groups have access to centralized analytics tools and support ideally suited for the needs of their own analysis and reporting.	31%	68%	Our business division/department members have access to data and are able to run data analytics and generate insights reports themselves.	34%	65%
We routinely and formally evaluate and optimize our process to refine new business models that emerge from data and analytics.	27%	73%	Our business has realized at least one new revenue stream or business model from data and analytics.	34%	66%
Having big data infrastructure that is centralized and tightly integrated across the organization, allowing business divisions/departments to align priorities with the organization's data roadmap.	31%	68%	We regularly align our business division/department priorities with the organization's data roadmap.	38%	60%
Having the necessary enterprise-grade standards in place for security, back-up, and disaster recovery across all environments.	37%	62%	Our business division/department has peace of mind when it comes to security, back-up and disaster recovery if and when is needed.	38%	62%

Figure 1: To what extent has your organization achieved the following capabilities? [Base sizes in table], "Not completely achieved" is based on the sum of "Mostly achieved", "Somewhat achieved" and "Not in place", showing global manufacturing scores, omitting some answer options.

Although there's a glimmer of optimism in terms of organizations' current capabilities, there's an evident need to improve to get the most out of their data. Organizations that recognize these areas and strive to address them will see notable and positive differences in how their data is managed and utilized to inform business critical decisions.

## Methodology

This report specifically focuses on the analysis of the manufacturing industry (including IT and technology) which consisted of 325 ITDMs and 169 SDMs. Respondents were from organizations with 1,000 or more employees.

All interviews were conducted using a rigorous multi-level screening process to ensure that only suitable candidates were given the opportunity to participate.

## Conclusion

The manufacturing industry are improving resiliency, innovation, quality, sustainability data and analytics, putting the customer and their products at the center. In doing so, they're able to progress to product and service development, connected manufacturing, and the optimization of their operations and processes. With this comes challenges and areas where notable improvements can be made to best optimize their data, thus abilities to drive effective business critical decisions.

Improving the effectiveness of enterprise data strategies is a good place to start and ensures that organizations aren't limiting potential. Organizations that embrace transformation fueled by data will develop the agility and a competitive advantage to excel in the future.

### About Cloudera

At Cloudera, we believe that data can make what is impossible today, possible tomorrow. We empower people to transform complex data into clear and actionable insights. Cloudera delivers an enterprise data cloud for any data, anywhere, from the Edge to AI. Powered by the relentless innovation of the open source community, Cloudera advances digital transformation for the world's largest enterprises.

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