

The ability of artificial intelligence and machine learning tools to augment people in the supply chain will be critical in the future. Indeed, these autonomous technologies are central to the notion of a thinking supply chain.

Realizing Supply Chain Transformation with Artificial Intelligence and Analytics

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Introduction

The supply chain is now a critical function for companies to realize their aspirations. It is a competitive weapon in the modern, digital economy across many different industries, including automotive, telecom, consumer goods, and retail. Advanced supply chain capabilities can support more efficient and effective business approaches as well as new models that translate directly to performance that is tangible and measurable.

The importance of the supply chain to business success in the modern, digital economy means transitioning from a functional area that has traditionally been viewed as a "cost center" to a functional area that must be leveraged as an "opportunity center." In addition to functional excellence, this means having the ability to collect, consume, and disseminate data-driven insights in real time both within the supply chain and to adjacent functions such as sales and marketing.

It is IDC's view that the capability most likely to help companies drive differential performance in the supply chain in the future will be the ability to take in data and use it to drive better decision making. Analytics therefore plays a key role in evolving to a digital thinking supply chain. It is also our view that "everything is a data problem." The hype that currently surrounds discussions on the Internet of Things (IoT), for example, often fails to recognize that an army of sensors does not generate value; rather, the data generated by those sensors feeds actionable insights that generate value.

Several interesting technologies at various stages of maturity will impact how supply chains collect, consume, and disseminate data and insights. Advanced analytics will drive value for all constituents in the supply chain by unlocking the value in data, driving efficiency and incremental revenues. However, as data sources grow in volume and variety, the ability of artificial intelligence (AI) and machine learning (ML) tools to augment people in the supply chain will be critical. These autonomous technologies are central to the notion of a thinking supply chain.

AT A GLANCE

KEY STATS

By the end of 2021, one-third of all manufacturing supply chains will use analytics-driven cognitive capabilities, thus increasing cost efficiency by 10% and service performance by 5%.

Supply Chain Analytics Macro Trends

As supply chains transition from traditional analog organizations to digital thinking facilities, there are four analytics-related macro trends worth noting:

- » **Rapid integrated business planning.** By the end of 2020, half of manufacturers will use analytics, IoT, and social collaboration tools to extend the integrated planning process across the entire enterprise in real time.
- » **The thinking supply chain.** By the end of 2021, one-third of all manufacturing supply chains will use analytics-driven cognitive capabilities, thus increasing cost efficiency by 10% and service performance by 5%.
- » **Automation.** By 2022, digital technologies will have enabled the automation of repetitive operational tasks, leading to 50% less planner intervention and "touchless" sales and operations planning.
- » **Demand forecasting.** By 2024, one-third of large manufacturers will use actual demand data instead of short-term forecasts, resulting in an on-time/in-full delivery improvement of 2 percentage points on average.

These trends have two broad implications. First, analytics offer a horizontal play across the supply chain with an opportunity to materially improve overall functional integration. Second, supply chain analytics have wide market potential across verticals, including retail, consumer packaged goods (CPG), automotive, telecom, and pharmaceuticals, in the next two to three years.

Challenges and Opportunities in the Supply Chain

The availability of relevant data and the analytics needed to process that data create an opportunity to advance supply chain capabilities significantly. There certainly remains a desire to optimize cost, but most of the new capability is targeted at delivering superior customer experiences, enabling disruptive innovation, and gaining market share. Of these, customer centricity is the most significant driver of change in the supply chain. This central goal also creates new sources of complexity for the supply chain planning organizations, such as:

- » **Planning for end item explosion.** As products become increasingly personalized and targeted to markets of one, the number of variations that must be planned for and supported is increasing exponentially while order quantities shrink. This presents particular challenges to traditional demand planning and inventory management capabilities — there is a direct causal relationship between the number of stock-keeping units (SKUs) under management and the ability to plan demand and inventory.
- » **Delivery as product.** Options for direct to consumer, whether handled by the manufacturer or through a marketplace, transform the supply chain from supporting the product to being at least part of the product. The ability to manage product and experience delivery to consumers means leveraging more diverse data sets (including unstructured data) across many more data sources (2,000 customers versus 2 million consumers).

- » **Continuous delivery.** With subscriptions available to customers for everything from printer ink cartridges to razor blades, complex replenishment challenges must be planned for and met. Every day, supply chains face the challenge to move products faster and farther, often with more volatile demand signals and more inventory locations.
- » **Innovation enablement.** As a greater percentage of revenue is from new products, the supply chain must be an enabler of innovation, not a drag. The ability to both plan for new products (pipeline and ongoing) and ensure target margins are met through spend control and optimization is a critical enabler.
- » **Global reach.** Both labor arbitrage (for supply) and growing economies in Asia (for demand) mean global complexity. Assuming the current trade wars are resolved sensibly, there is every reason to think that globalization will continue to grow. This trend adds yet another layer of complexity to demand forecasting, inventory management and spend management, and optimization.

As with prior waves of supply chain advancement, companies that don't put the correct planning capabilities in place to leverage data in a digital thinking supply chain will find themselves severely disadvantaged in the marketplace. It is IDC's view that supply chains that do a better job of leveraging data and analytics will outperform those that do not.

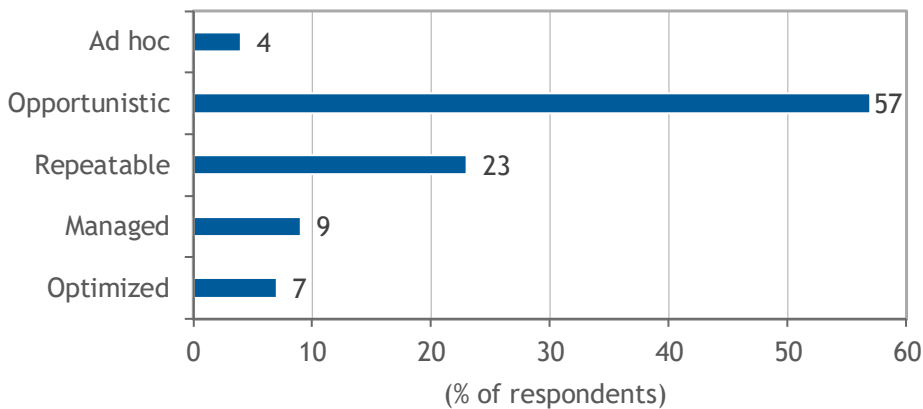
The single biggest driver of both challenge and opportunity is that of customer centricity and the transforming role of the consumer. The growing importance of the consumer requires levels of product quality, personalization, and performance that only a digital thinking supply chain can support with data and analytics. Supply chains that can collect and analyze consumer-level data in real time, for example, will be able to respond more effectively to better meet consumer experiences. There is little question that the bar is being raised for the supply chain in terms of greater expectations from traditional customers such as retailers and resellers as well as from consumers, who increasingly expect flexibility and transparency in their purchasing experiences.

It is not enough, however, to simply leverage the traditional elements of supply chain planning and execution — that is too limiting. Having a thinking supply chain that functionally leverages broad and deep data sets for real-time insights across the design, plan, manufacture, and deliver processes should be the goal for all supply chains. Examples would include the ability to bring targeted innovations to market more quickly or to better understand the product-related services that would add value to the consumers and customers — and revenue to the business. This does not mean that most companies are there yet. In fact, most are not. But companies must understand that this goal will be an important part of the successful, future supply chain.

A recent IDC MaturityScape Benchmark survey conducted with 150 supply chain respondents asked about their self-reported maturity level for the key dimension of connected systems, data, and processes. Most rated themselves on the less mature side of the median as represented by the "Repeatable" category shown in Figure 1. Only about 16% felt they were more mature than the median; almost 61% felt they were less mature. This means that many companies have only just begun the journey; it also means that they are not that far behind. It also shows that they need help.

FIGURE 1: ***Maturity of Connected Systems, Data, and Processes***

Q How would you assess the overall maturity of the data management and analytics capability as it relates to your supply chain?

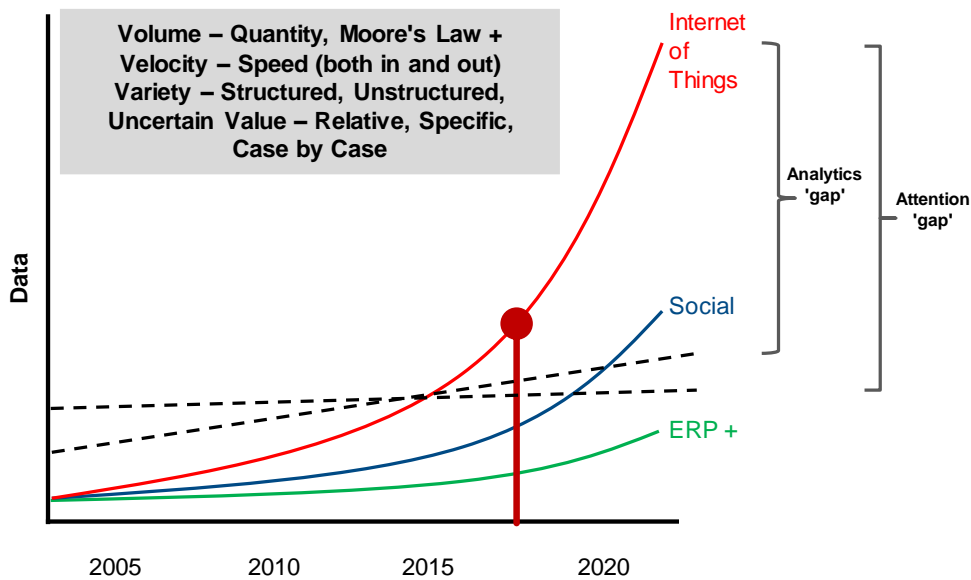


Source: IDC, 2019

Advanced Supply Chain Analytics Drives Differentiated Performance

The digitally thinking supply chain is a critical competitive weapon in the modern, digital economy. Advanced supply chain capabilities can support more efficient and effective business approaches as well as new models that translate directly to business performance that is tangible and measurable. If we accept as gospel that the data volumes and variety available to the supply chain will continue to grow, the ability to keep up in terms of both analytics and decision-making capability is critical.

In discussions with supply chain organizations, we have found that they understand the broad upward trajectory of data. What worries them is whether their analytics capabilities will be able to keep pace and whether they have enough people to leverage the insights. The corresponding analytics and attention gaps are illustrated in Figure 2. It is not overly hyperbolic to suggest that organizations that drive supply chain excellence with AI/ML-enabled supply chain management (SCM) analytics capabilities will outperform those that cannot. The ability to have descriptive, diagnostic, predictive, and even prescriptive analytics across the entire depth and breadth of the supply chain (plan, make, source, deliver, and return) is already a game changer for some supply chain organizations. As others move up the maturity progression illustrated in Figure 1, it will be a competitive imperative for them as well.

FIGURE 2: *Analytics and Attention Gaps*

Source: IDC, 2019

The benefits of an AI/ML-driven analytics capability are both broad and deep for the supply chain:

- » Forecasts improve with better demand signal capture.
- » Data retrieved from product movement can give insights into customer flow or preferences.
- » Maintenance on equipment is completed preemptively, reducing the risk of unplanned downtime.
- » There is greater ability to make the right decision at the right time.
- » Efficiency and effectiveness are enabled.
- » There is an interlinking of demand, inventory, and spend to drive differentiated supply chain efficiency.

Considering Tech Mahindra

Tech Mahindra's Supply Chain Analytics management solution provides end-to-end visibility insights across the SCM value chain. The solution overhauls critical supply chain constraints such as identifying the right demands, optimizing inventory, and reducing spend to effectively deal with the variety, variability, velocity, and visibility of supply chains. This methodology helps organizations obtain descriptive, diagnostic, predictive, and prescriptive insights. It also provides recommendations for streamlining operations, enhancing revenue potential, and optimizing cost. The solution's prebuilt and end-to-end analytics can unearth hidden data insights and help enterprises reduce time to market and improve cost effectiveness.

The solution is powered by iDecisions, which addresses multiple verticals by leveraging more than 450 SCOR-compliant KPIs to provide cross-functional orchestration. Features include:

- » Big data enabled
- » AI/ML-driven approach to demand sensing, inventory visibility, and spend control/optimization
- » Proprietary forecasting engine to enhance forecasting accuracy
- » Inventory and spend optimization
- » Multivariate analysis across SCM value chain
- » SCOR model-driven KPIs and data models specific to industry/function
- » On-premise or on-cloud implementation
- » Prebuilt solution components across data ingestion and quality, data model, and role-based dashboards that "tell an underlying business story"

Tech Mahindra's solution keeps the industry view and need as its core focal point, which helps it address multiple verticals, including manufacturing, retail, CPG, telecom, and pharmaceuticals, and any organization that grapples with supply chain complexity. This helps businesses derive significant savings and improve metrics as illustrated in Figure 3.

FIGURE 3: **Benefits That Accrue from Tech Mahindra SCM Analytics**



Source: Tech Mahindra, 2019

Improving the metrics in the SCM journey involves key aspects of transformation on the digital and cultural aspects. The guiding principles should be customer centricity and operational excellence. Asset traceability and real-time inventory visibility are the means to achieve this.

For example, Tech Mahindra has built a state-of-the-art digital platform for a leading telecom provider in the United States that includes microservices and serialization of the inventory. This platform improved the realization of benefits in terms of product availability and real-time traceability.

For a customer in China, Tech Mahindra commissioned a multicountry implementation of a supply chain data mart to provide a comprehensive corporate view of supplier and sales performance. This project also allowed the customer to explore opportunities for spend control by consolidating suppliers.

Challenges

The supply chain is a crowded space, with most vendors claiming analytics and AI as "their" source of competitive differentiation. Whether that proves to be true in some cases or whether AI becomes table stakes for all vendors selling analytics into the supply chain remains to be seen. It will be critical for Tech Mahindra to articulate how it is different and how it is able to achieve better consequential business results than competitors. Supply chain analytics is a highly competitive space with often confused target customers, a lack of message clarity, or a lack of specificity of the value proposition. Ultimately, it is incumbent on vendors such as Tech Mahindra to clearly state how they meet today's challenges while preparing for tomorrow's opportunities.

Conclusion

A digitally enabled thinking supply chain is about the ability to drive new levels of efficiency and effectiveness and to enable a transformational business model heretofore impossible with traditional approaches. In terms of maturity, supply chains are broadly in the early days of digital transformation. This situation is not a license to "sit on your hands" certainly, but the fact that only 16% of companies view themselves in the most mature stages (versus 61% in the two least mature stages) means that it's not too late to get going.

If companies are to advance their supply chains to be a competitive advantage, rather than a competitive liability, evolving to one that is data and analytics driven will be critical. The importance of the supply chain to business success in the modern, digital economy means transitioning from a functional area traditionally viewed as a cost center to a functional area that must be leveraged as an opportunity center. A thinking supply chain will be an important component of differentiation in the market.

As you think about the state of the supply chain at your company, consider the following questions:

- » What will an advanced data and analytics capability mean for your business? Is it important? If so, why?
- » What value will you get from insights that can be a strategic engine rather than a tactical engine for business growth?

A thinking supply chain will be an important component of differentiation in the market.

- » How much value do resources allocated to improving products and services generate for your business versus the disconnected firefighting that exists today?
- » Are you ready to explore modern digital data and analytics technologies? They are necessary ingredients to enable rapid, accurate decision making.

Finally, find a vendor that can partner with you to drive advanced data and analytics in your business.

About the Analyst



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As a program vice president, Simon Ellis is responsible for providing research, analysis and guidance on key business and IT issues for manufacturers. He currently leads the Supply Chain Strategies practices at IDC Manufacturing Insights, one of IDC's industry research companies that address the current market gap by providing fact based research and analysis on best practices and the use of information technology to assist clients in improving their capabilities in critical process areas. Within the Supply Chain practice, Mr. Ellis is directly responsible for the research in the Supply Chain Planning Strategies practice while also managing the Supply Chain Execution Strategies practice.

MESSAGE FROM THE SPONSOR

Today, enterprises are investing more and more efforts in transforming their supply chain by leveraging digital technologies including analytics, AI, and ML. With increased adoption of analytics along with AI and ML, enterprises now have the technology and tools to generate actionable insights and transform their supply chain to improve operational efficiencies and customer experience. Although availability of real-time insights is still a challenge, over time service providers will come up with innovative solutions and services to address the need of the hour.

In future, we will witness growing adoption of analytics, AI, and ML across the supply chain life cycle: demand sensing and forecasting, spend optimization, dynamic stock management, scheduling warehouse performance, tracking and supplier performance, etc. And certainly, this data and analytics enabled supply chain transformation will improve speed, visibility, agility, consistency and predictability of shipments movement across the value chain to delight the end consumers.



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