



# Scaling AI in the supply chain

The next step toward intelligent,  
self-driving supply chains

# Business Situation



# New demands are stressing the supply chain

It's certainly no longer "business as usual" for supply chains. A convergence of factors has placed significant pressure on organizations' supply chains to address a wide range of new challenges and priorities that, in many cases, existing supply chain capabilities aren't capable of handling. In particular, companies' are hampered by a lack of visibility.

It's been well documented, for instance, that COVID-19 caused large-scale supply chain disruptions, risks, and uncertainty that nearly paralyzed companies for a time—largely due to a combination of unforeseen demand spikes and insufficient capabilities to respond to them—and these challenges are still wreaking havoc in companies today.



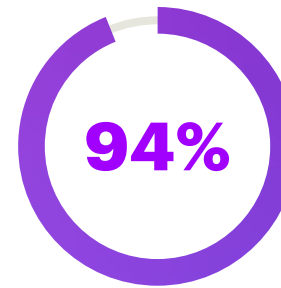
Accenture's Business Futures research<sup>1</sup> found only around three in 10 supply chain executives were very confident in their ability to foresee and respond to future events, including supply chain bottlenecks, equipment or process failures, and demand pattern changes.

The war in Ukraine, in addition to being a devastating humanitarian disaster, has exacerbated the situation even further,<sup>2</sup> injecting new uncertainty into an already unpredictable economic environment.

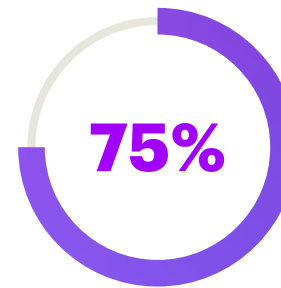
However, the disruptions companies are dealing with today aren't limited to those created by the pandemic or the war. More and more, customers are demanding hyper-personalized products, services, and experiences—all delivered with minimal lead times, at lower costs, to a location of their choice. Additionally, global trade and tariff tensions and labor force shortages in the logistics industry also have contributed to a volatile environment that's having an upending effect on supply chains.

The compounding effect of these disruptions is an unprecedented rise in costs. For instance, the average price to ship a 40-foot sea container has quadrupled<sup>3</sup>; truck driver salaries are soaring<sup>4</sup> due to labor shortages in major economies like US and UK; and commodity prices are the highest since 2014 with inflation in the United States reaching a level<sup>5</sup> not seen since the early 1980s.

And then there's the ever-growing interest in and demand for responsible, sustainable business practices from consumers, governments, investors, and other critical stakeholders. Customers, in particular, are increasingly concerned about environmental impacts, and it's a driving—if not the top factor—when they decide which companies or brands to buy from. This places even more pressure on supply chains, which are responsible for most of the world's emissions.



Research conducted at the onset of the pandemic found **94% of Fortune 1000 companies** experienced supply chain disruptions<sup>6</sup>



and, according to an ISM survey<sup>7</sup> conducted around the same time, **nearly 75% of companies** had problems with capacity as a result of COVID 19-related transportation restrictions.

## The bottom line:

Supply chains face greater risks and challenges than ever before and a far more complex equation to solve.

Yet most existing supply chains were built for a different time, when scale was achieved by delivering truckloads of goods *en masse* to warehouses and then big-box stores. This model relied on a high level of demand predictability (so visibility was less important) and valued efficiency over resiliency.



With supply chain disruption everywhere, this model must change—but how? Companies won't be able to address it through targeted initiatives or selective technology implementations.

Instead, to rise to the occasion today, companies need to think far bigger: **a full-scale reconstruction of the supply chain and manufacturing network that will enable companies to become more resilient, relevant to customers and employees, and responsible toward the environment and society.**

That's the end goal. Getting there will require implementing critical short-term responses—such as flexible workforce policies and targeted control towers—to address both current and future externalities; as well as accelerating priority initiatives (both existing and new) that will have the biggest impact on the business. Ultimately, it will involve building

a new supply chain platform over time, comprising an integrated ecosystem of differentiated capabilities, intellectual property, committed talent, and flexible assets that can enable a company to quickly identify and capitalize on incremental growth opportunities.

At the core of this transformation are data and artificial intelligence (AI), which are uniquely positioned to provide the insights, agility, and speed companies need to build a completely new supply chain that's fit for today, tomorrow, and years to come. AI and data have the power to fundamentally shift business models and can serve as an engine for collaboration and profitable growth.

These technologies can help companies predict and mitigate risks before they occur. And they can provide deep insights on changes companies can make to their supply chains to minimize their negative impacts on society and the planet.



**86%**

of COOs say<sup>8</sup> AI is essential for achieving their growth objectives.



**40%**

of supply chain executives participating in Accenture's Technology Vision research<sup>9</sup> said AI is the second priority for scaling in a post-pandemic world, just behind the cloud.

# Opportunity



# An intelligent and connected supply chain

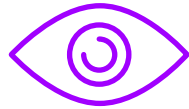
Companies that can put data at the core of their supply chain and apply AI to it at scale can create a connected and truly intelligent supply chain network.

An intelligent supply chain can benefit companies in numerous ways. It can help them gain visibility to late-breaking supply disruptions or demand blips, providing the information needed to resolve issues in near real time. It helps increase agility so companies can deliver on unique customer requirements with speed, specificity, and scale—boosting product availability and service levels, reducing lost sales and inventory costs, and increasing production and fulfillment efficiency. And it can increase resiliency (e.g., maintaining On Time and In Full service metrics) while reducing companies' carbon footprint and overall sustainability risk.



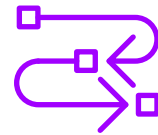


# What does an intelligent supply chain network look like?



## Centrally controlled with end-to-end visibility

- Supply chain control towers—based on intelligent technologies that capture, process, and use vast sets of structured and unstructured data—enable companies to centralize data and insights and speed and improve decision-making
- Digital hubs bring together people, processes, and technologies to create a 360-degree view of the supply network—across all tiers of suppliers and routes to market



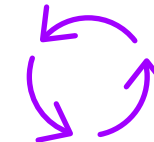
## Digitally replicated

- A digital twin,<sup>10</sup> which is a virtual replica of the end-to-end supply chain, can help companies:
- Drive scenario planning that allows a company to make predictive decisions based on business needs
  - Optimize existing processes, their inventory positions, and their overall network through advanced modeling
  - “Stress test” the entire supply chain to identify where it’s vulnerable to disruptions and how to respond
  - Identify the optimal network design to boost the sustainability of the entire supply chain



## Connected and integrated through cloud

- Cloud<sup>11</sup> is a secure, scalable, enabler that integrates data across the supply chain
- With AI and the cloud, companies can move from manual sales and operations planning (S&OP) cycles to ones that are fully collaborative, data driven, and platform based
- Participants can share qualitative information and real-time data from supply chain systems, review reports, and discuss implications all on an ongoing basis
- As exceptions are identified or opportunities arise, planners can create resolution options, share with stakeholders, discuss on the collaborative platform, and take immediate action
- All qualitative information that’s currently being exchanged—and lost—in phone calls and emails is saved along with the changes



## Hyper-personalized and flexible

- Agile processes and networks enable companies to quickly sense and appropriately respond to changes in customer demand
- ML-based tools can provide insights that might go unnoticed otherwise, as the unsupervised learning can identify trends in the high volume of variables and information
- Real-time visibility into market data can produce greater insight, variation, and urgency of understanding and meeting demand requirements
- Companies can hyper-personalize order fulfillment by channel, service level, and locality

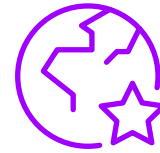
# Insight



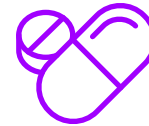
# The challenges to leveraging data and supply chain AI at scale

Data and AI arguably are the most important drivers of the intelligent supply chain, and many companies are making progress in deploying AI-related capabilities.

But these are the exceptions, not the rule. To the right, we've included a few prominent examples of companies making progress today.



**A global consumer goods client** used a cognitive automation solution and digital twin to simplify its complex supply chain, enabling end-to-end visibility for inventory replenishment.

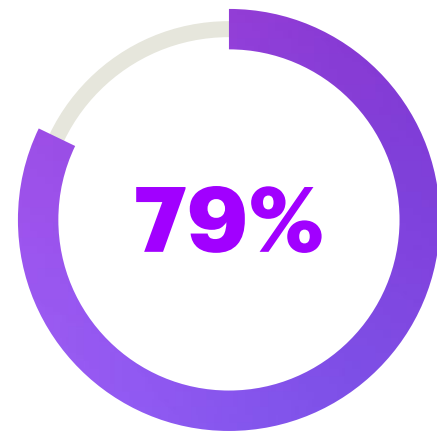


**A pharmaceutical client's** animal health division used an integrated demand planning tool to generate an accurate demand forecast and improve sales across the company's approximately 10,000 SKUs sold in around 50 countries.



**A global healthcare company** integrated its cross-functional units using cognitive automation, with a digital twin suggesting real-time changes in manufacturing processes to adapt to the increasing demand while optimizing inventory and logistics costs.

Despite recognizing the power and value of data and AI, companies will likely continue to find it difficult to leverage their investments more broadly.



In fact, a full **79% of COOs**<sup>12</sup> acknowledge they know how to pilot but struggle to scale AI across the business.

Why? A number of obstacles are holding them back. The biggest, by far, is that supply chain leaders don't have a clear, trusted link between the use of data and AI and the operational improvements that drive value. In other words, they don't have demonstrably clear evidence that AI "works."

Why is this? It's often because other common challenges prevent leaders from getting such evidence.

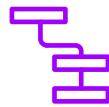


# Common challenges



## Functional silos

Organizations have data sitting in silos across the enterprise. When data is fragmented and disconnected, the ability to apply intelligence, generate insights, and drive value is limited.



## Prioritizing use cases

While it's beneficial that AI's potential is massive, and the technology could be applied to myriad areas of the business, it also makes it hard for companies to align their AI strategy to their business strategy and prioritize the use cases where AI can deliver the most value.<sup>13</sup>



## Data strategy and quality

Businesses also struggle with the types of data they collect. They either don't have the right data or the right quality of data to drive the results they're looking for.



## Finding the right solutions

Companies have so many vendors, technologies, and solutions to choose from that all sound like they promise the same thing, which makes it difficult for companies to determine which one is right for them.



## Ownership

Many companies find it difficult to settle on who drives the larger rollout of AI and who leads the initiative. With uncertainty over who's "in charge" or pushing for it, AI initiatives could easily flounder.



## Lack of qualified talent

When trying to scale AI, many organizations know they need and are focused on hiring highly technical employees like data scientists. But this technical expertise needs to be paired with knowledge of the business and strategy. Collaboration between these two "worlds" is necessary for AI to have significant impact.



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“Traditional supply chain organizations operate in fragmented, functional silos that focus on optimizing a particular aspect of the supply chain, rather than **optimizing across the entire value chain.**”

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# Breaking through the obstacles to greater impact

Overcoming these obstacles isn't easy—but it must happen for AI to scale and deliver genuine business value. In our experience, three things can help minimize the roadblocks and allow AI to flourish across the enterprise.

- 01** Strategy and Road Map
- 02** Cloud
- 03** Talent



# 01

## **Strategy and Road Map: Plotting the Destination and How to Get There**

AI isn't just a technology transformation. Rather, it helps drive the transformation of the entire enterprise, connecting data and people, ideas and outcomes. Such a transformation requires aligning the data strategy to business goals, adapting business-wide systems to support data-driven decision making, and nurturing the talent and data culture to drive adoption on a large scale.

The first thing a company needs for AI to have a large-scale impact is a clear and integrated vision of where the enterprise wants to go with AI—its North Star, so to speak. It can't be limited to one function, department, or business unit—that's the antithesis of scaling.

**Also critical is the ability to translate this vision into the major initiatives the company must execute to achieve the end goal.**

Both are vital to taking the subsequent steps to build the foundation that enables a company to realize short- and long-term value from AI and, importantly, to get C-level buy-in to fund such a mega-investment. These key stakeholders can help the company progressively generate value from near-term steps and activities (which helps to pay for subsequent steps) while ensuring everything contributes to the longer-term future the company has painted for itself.



# 02

## Cloud: Harnessing Data for a Single and Trusted Source of Truth

AI and advanced analytics can process massive and diverse data sets from all functions to provide better visibility across the supply chain network. But with more data sources, more computational power and more server capacity will be needed. With the cloud, a company can connect this data to create one single and trusted source of truth.

To get the biggest benefits from the cloud, a company needs to determine whether it will use a single cloud provider or pursue a hybrid, multi-cloud model to get the best each of the major cloud providers has to offer.

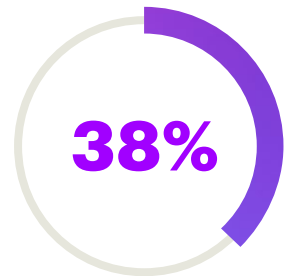
**The cloud also enables organizations to tap into new data sources to extend and enhance visibility and, thus, create greater opportunities for AI to deliver value. Some examples include:**

- Sensor data at customer locations
- Sensor data on industrial assets (manufacturing)
- Data from the human and digital workforce
- Data from end-consumer devices
- Multiple points of sale
- External data warehouses
- Social media analytics (to monitor sentiment, spot market trends, anticipate customer needs, and respond faster to change)

# 03

## Talent: Building and Buying the Right Skills

As mentioned earlier, many companies find they don't have the right talent in place to successfully scale the use of AI in supply chain.



In fact, Accenture research<sup>14</sup> found that **only 38% of supply chain executives** feel their workforce is ready to leverage the technology provided to them.

Companies need data scientists who can handle the technical side of algorithms and modeling, and those roles are becoming increasingly common in the supply chain. But data scientists, while important, aren't enough to implement AI at scale. In our experience, many companies hire technically proficient data scientists who spend a lot of time experimenting with AI models that go nowhere because they lack a strong application to the business. In other words, data scientists alone can't drive a transformation. Companies also need the business perspective and expertise.

Companies need people who both understand the technology and the business, and can guide the data scientists in developing algorithms that solve business problems and deliver specific desired outcomes. Unfortunately, these people are in very short supply. Thus, upskilling or reskilling<sup>15</sup> people to be proficient in applying AI to specific use cases that generate significant value is absolutely vital to the scaling of AI. One highly effective method of skilling involves what Accenture calls Skills Ontology.<sup>16</sup> It's an approach that uses AI and machine learning to match "proximate" or similar skills from old roles to new roles and, subsequently, chart a pathway to effective skilling across the supply chain. Early adopters are using Skills Ontology not only to map the future skills they need, but also to understand who in their current organization has the best matching profile to be trained up in these new areas.

Ecosystem partners such as technology vendors and consulting firms also can be great sources of important skills, supplying talent who can augment a company's existing employees where needed. Such companies have already gone through the steep learning curve required to scale AI and learned the lessons. Their insights and guidance can be extremely valuable in helping companies through what's often a difficult and complex undertaking.

# In Practice





## A digital twin helps an automotive supplier manage disruption

While the challenges aren't easy to overcome, leading companies are taking these actions to heart—and it's paying off in the form of bigger impact from the use of AI in the supply chain. The experience of one such company, a supplier of automotive parts and technologies to Original Equipment Manufacturers (OEMs) in the global auto and truck manufacturing industry, shows how to do it and the significant benefits that are possible.

Like many providers of conventional and advanced parts and systems in the automotive industry, this company had become more and more vulnerable to disruptions of its supply chains both for raw materials and for components and sub-components—especially those that go into the company's high-margin advanced technology products. Many of its shortages and supply chain disruptions had become quite severe and were

threatening the company's ability to deliver products to OEMs in the short term. But more worrisome, its long-term status as a leading or preferred parts supplier to top OEMs also was being threatened. Its revenues and profits were eroding in the short and intermediate term, while the damage being done to its reputation was putting its long-term growth and profitability at risk.

The company sought Accenture's help in finding ways to reduce its operational and financial risk and to increase its operational resilience against both short- and long-term supply chain disruptions. Company leaders believed that recognizing more quickly any new or growing risk elements within the company's own supply chains would allow the company to make smarter, quicker, and better decisions that would reduce or eliminate those risks.

To help the company identify risks before they may become problems, Accenture deployed a “resilience stress test”<sup>17</sup> based on Accenture’s previous collaboration with researchers at the Massachusetts Institute Technology (MIT). This stress test includes a digital twin of the auto supplier’s supply chain and operations, based on the company’s data, that can model thousands of disruption scenarios and how the company would be affected.

**The digital twin uncovers the weak spots— or points of greatest risk—in the company’s supply chain, identifies the source of those risks, and suggests possible corrective actions.**

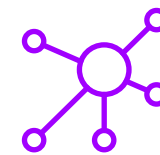


# What's the benefit?

With the ability to run its own resiliency stress tests, the company can perpetually and proactively spot any new or recurring risks within its supply chains and take steps to reduce or eliminate them. In doing so, the company would:



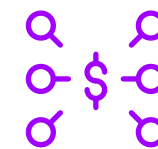
**Save potentially hundreds of millions of dollars annually** thanks to early discovery of and deep insights into potential risks. Already it has saved several hundred million dollars by taking steps to reduce its “revenue at risk.”



**Respond faster to risks**, first by diagnosing them sooner, and then by having much deeper and better insights into those risks—which, in turn, enables the company to respond to them quickly and effectively.



**Ensure the kind of production and delivery reliability** that will please its current customers and win new business from both new and existing customers.



**Grow its revenues, market share and profits** from the combination of increased sales and lower materials handling, production, labor, and shipping unit costs.

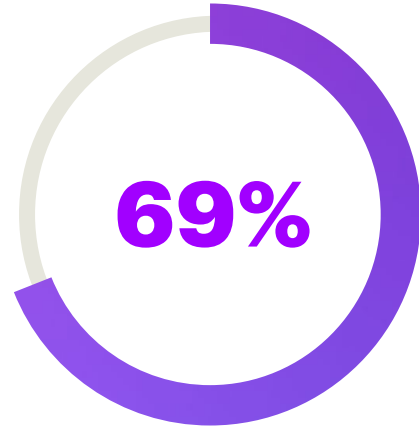
# Conclusion





Intelligent technologies and connected end-to-end data, when combined at scale, can add immense value to any company's supply chain. The combination unifies the supply chain, creates new efficiencies and operational capabilities, and unlocks capital to reinvest in new business models that enrich customer experiences, build competitive advantage, and support profitable growth.

Longer term, this powerful combination of technologies and data will fuel a shift toward truly self-driving supply chain networks—which take value and innovation to a whole new level. Digital twins are one current example.



Accenture research<sup>18</sup> found that **69% of chief supply chain officers** are increasing their organization's investment in intelligent digital twins in the next three years, which is an important step toward autonomous operations.



AI in the supply chain can also automate demand planning, supply planning, inventory optimization, and execution with a focus on making decisions automatically, without human intervention (i.e., a shift from human driving the machines to machines guided by the humans), while ML enables self-learning, predicting, prescribing, and optimizing supply chain performance automatically across functions.

And in a self-driving supply chain, automation can flag and resolve exceptions in real time—for example, ML-based algorithms can predict exceptions and supply chain outcomes and if the process changes over time, cognitive computing learns and adapts to it.

AI truly has the potential to transform any supply chain—and in today's environment, such a transformation isn't an option anymore. In fact, while just a short time ago AI was an aspiration for most companies, it's now gone from a nice-to-have to a must-have capability. With the right combination of people, processes, and technology, companies can stop piloting AI and start scaling it so the supply chain can begin to realize its full potential value—both in the short term and longer term.

**Explore how Accenture can help power more intelligent supply chains with analytics and AI. Visit [www.accenture.com/ai](http://www.accenture.com/ai)**

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