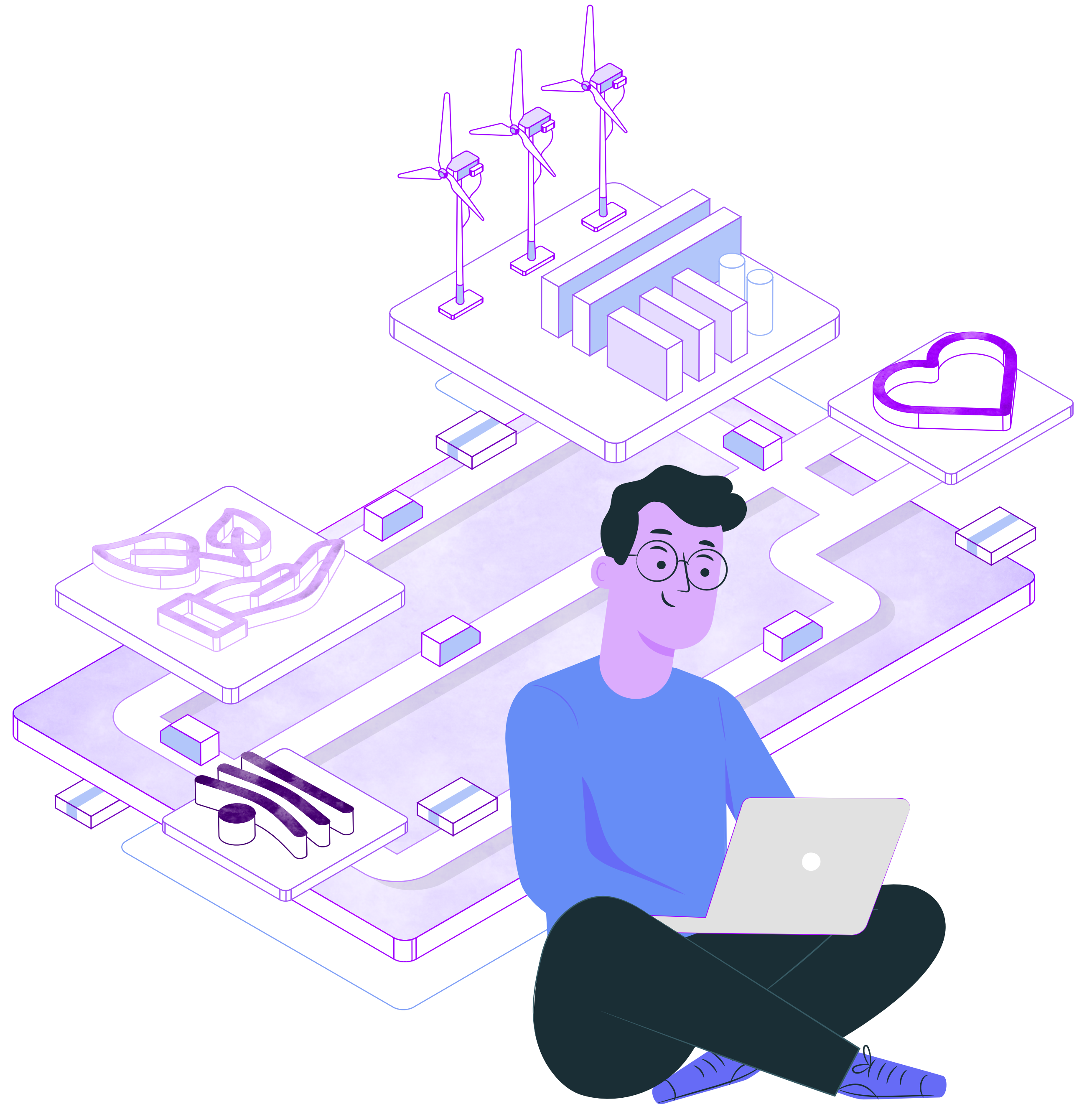




# Supply chain analytics and AI

in driving relevance, resilience  
and responsibility



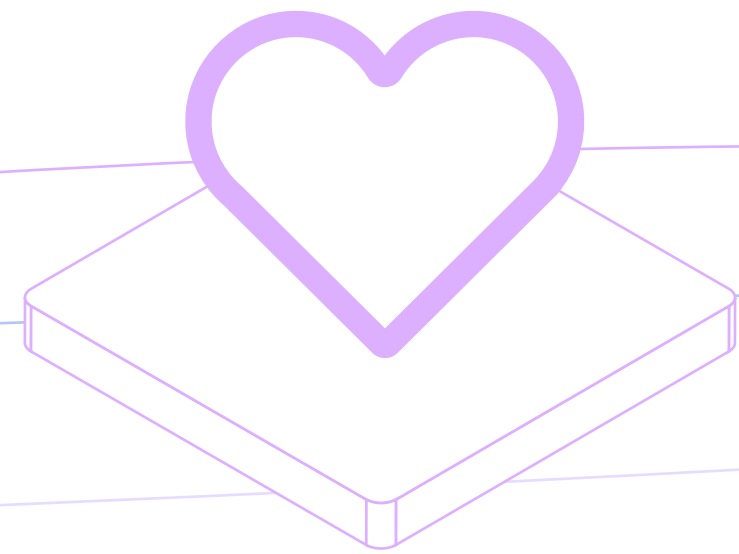
## It's not business as usual for supply chain organizations today

As technologies such as digital twins, machine learning (ML) and the internet of things (IoT) continue to mature and proliferate, companies everywhere can begin to do things never before possible.

These advanced technologies, working in concert with humans, can help companies create an intelligent supply chain that predicts and monitors the impact of nearly every decision they make, enabling them to balance three key outcomes that supply chain leaders today are expected to continuously and simultaneously achieve.

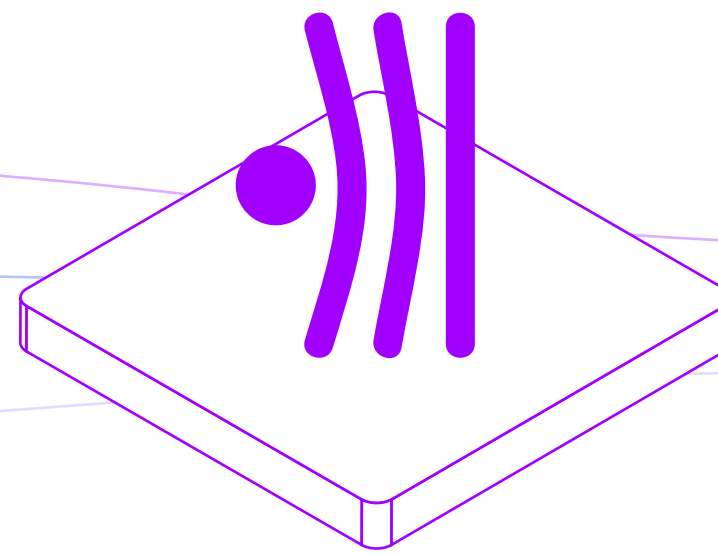


## Three key outcomes:



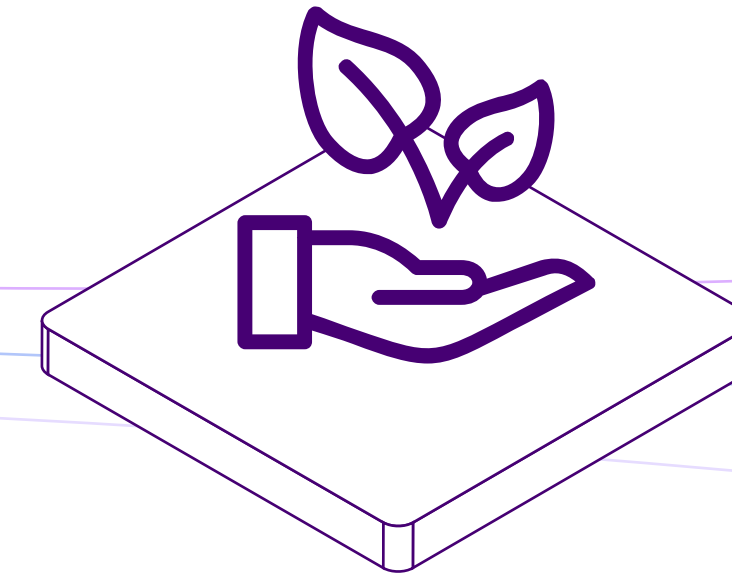
### Relevance

Customer and employee **relevance**, which secures future growth—According to the **Accenture Technology Vision 2020**, 76% of executives agree that organizations need to dramatically reengineer the experiences that bring technology and people together in a more human-centric manner. Such experiences help create more engaged employees and more loyal customers.



### Resilience

Operational **resilience**, which creates profitability and viability in a post-COVID world prone to crises—Accenture's July 2020 CxO Pulse Survey found that three-quarters of chief supply chain officers want to rethink their supply chains (including processes and operating models) to make them more resilient—which isn't surprising given the mass disruptions they've experienced in the past year.



### Responsibility

Business **responsibility**, which fosters prosperity for all without destroying the planet—A **sustainable supply chain is the top value proposition** for companies as consumers become more conscious about the products they are consuming—where they are sourced, how they are made, and how they are recycled.

These are all great ideas—but are there any companies actually working this way yet? According to recent Accenture research, there are.

A small group of Leaders we identified in our research—13%—excel at simultaneously delivering relevance, resilience and responsibility.

We found that across every industry surveyed, these companies are significantly outperforming Others in overall financial performance, as measured by EBITDA and enterprise value. These Leaders give us a window into what human and machine collaboration makes possible for all companies.

**The keys to simultaneously addressing relevance, resilience, and responsibility are advanced analytics and AI.** Our study shows that Leaders are adopting these powerful tools at scale and, in the process, getting a head start in capitalizing on the significant opportunities created by human and machine collaboration.

For example, at least half of the Leaders said they are investing more than US\$ 5 million in AI-embedded connected products, AI virtual assistants, advanced data analytics, intelligent automation, Industrial Internet of Things sensors, and AI-embedded connected products. Just under half said the same about ML/deep learning and sentiment monitoring analytics.

Furthermore 90% or more of both Leaders and Others agree that generating a return on this investment will require engaging with and scaling ecosystem partnerships with a wide range of players, acquiring and retaining analytics and AI-related skills, and embracing key digital platforms.

## Analytics and AI: Three critical use cases to drive immediate and significant value

Myriad use cases for supply chain analytics and AI exist, and the number continues to grow. But all use cases aren't created equal.

Some are more difficult to scale than others, and the impact on key business priorities can differ across use cases. This is why companies that are looking to increase their spending on and use of these technologies should focus their initial efforts to get the biggest return on their investment. **We think three use cases, in particular, make the most sense as starting points—all of which can play a significant role in helping companies maximize relevance, resilience and responsibility.**



## Advanced scenario modeling: Uncovering vulnerabilities and opportunities

One use case that's becoming increasingly important in the wake of COVID-19 is scenario modeling, often done with the help of a digital twin.

A digital twin is a virtual supply chain replica that represents assets, warehouses, logistics and material flows, and inventory positions—basically, an online, living version of a company's backbone that can be used to simulate supply chain performance, including all the complexity that drives value loss and risks.

A digital twin can be created for the end-to-end supply chain or for specific functional areas for targeted improvements. Underpinned by AI and the cloud, these digital doubles can help companies improve resilience by identifying potential vulnerabilities and optimizing key areas of their supply chain.

For example, a digital twin can serve as the foundation of a **supply chain stress test**, such as the one Accenture and MIT have developed. The test uses digital twin scenario modeling to assess potential operational and financial risks and impacts created by major market disruptions, disasters, or other catastrophic events. The test can enable companies to not only understand how resilient their supply chain and operations

are, but also to identify the weakest links and quantify the impact of those links' failures on fulfilling their role. This analysis, in turn, can help companies develop mitigating actions to improve resilience, and can also be used to reallocate resources away from areas that are deemed to be low risk to conserve cash during difficult times.

Scenario modeling also can help companies **optimize their network, processes, and inventory**—which not only improves overall operating and business performance, but also helps enable companies to achieve ever-higher responsibility goals.

## Network Optimization

Digital twin-driven modeling allows companies to design a network that optimizes cost and customer service levels, while simultaneously analyzing its carbon footprint. This ensures that companies can meet sustainability targets while delivering the best service for its customers. For instance, a company can design a network that reduces shipping times by minimizing the distances trucks must drive and, thus, reducing fuel consumption and emissions.

## Process Optimization

In many companies, processes have become increasingly complex due to global expansion and growing customer diversity—and, therefore, less efficient and more costly. A digital twin can help a company take a deep look at key processes to understand where bottlenecks, time, energy and material waste, and inefficiencies are bogging down work, and model the outcome of specific targeted improvement interventions. The identification and elimination of waste, in particular, can help minimize a process's environmental impact.

## Inventory Optimization

Modeling with a digital twin can help a company address a “single-echelon” inventory challenge (optimizing inventory in a single warehouse) as well as a “multi-echelon” one (optimizing inventory across the entire network), taking into account demand forecasts to improve replenishment policies and modify inventory levels according to demand. This helps improve customer-centricity by ensuring a company has the products customers want in stock, when they want them—avoiding stockouts while also improving a supply chain's responsibility by minimizing overall costs and the distances that inventory must be shipped to reach the end customer.

## Network cost savings with scenario modeling

One example of modeling-driven optimization is the experience of a global diversified technology company with a complex physical network spanning multiple business units. Accenture built a digital twin of the company's manufacturing configuration to help the company design and evaluate different network optimization scenarios. The digital twin generated deep visibility into product and plant profitability, which led to a portfolio simplification and segmentation strategy and, ultimately, a rebalancing of network volume that drove cost, service, and product optimization and unlocked new network capacity.

Network-wide cost savings as a result of the initiative has exceeded \$20 million.

In addition, scenario modeling enabled the company to identify the network and route configurations that would have the smallest CO<sub>2</sub> footprint and environmental impact, thus helping the company make major strides toward its sustainability goals.





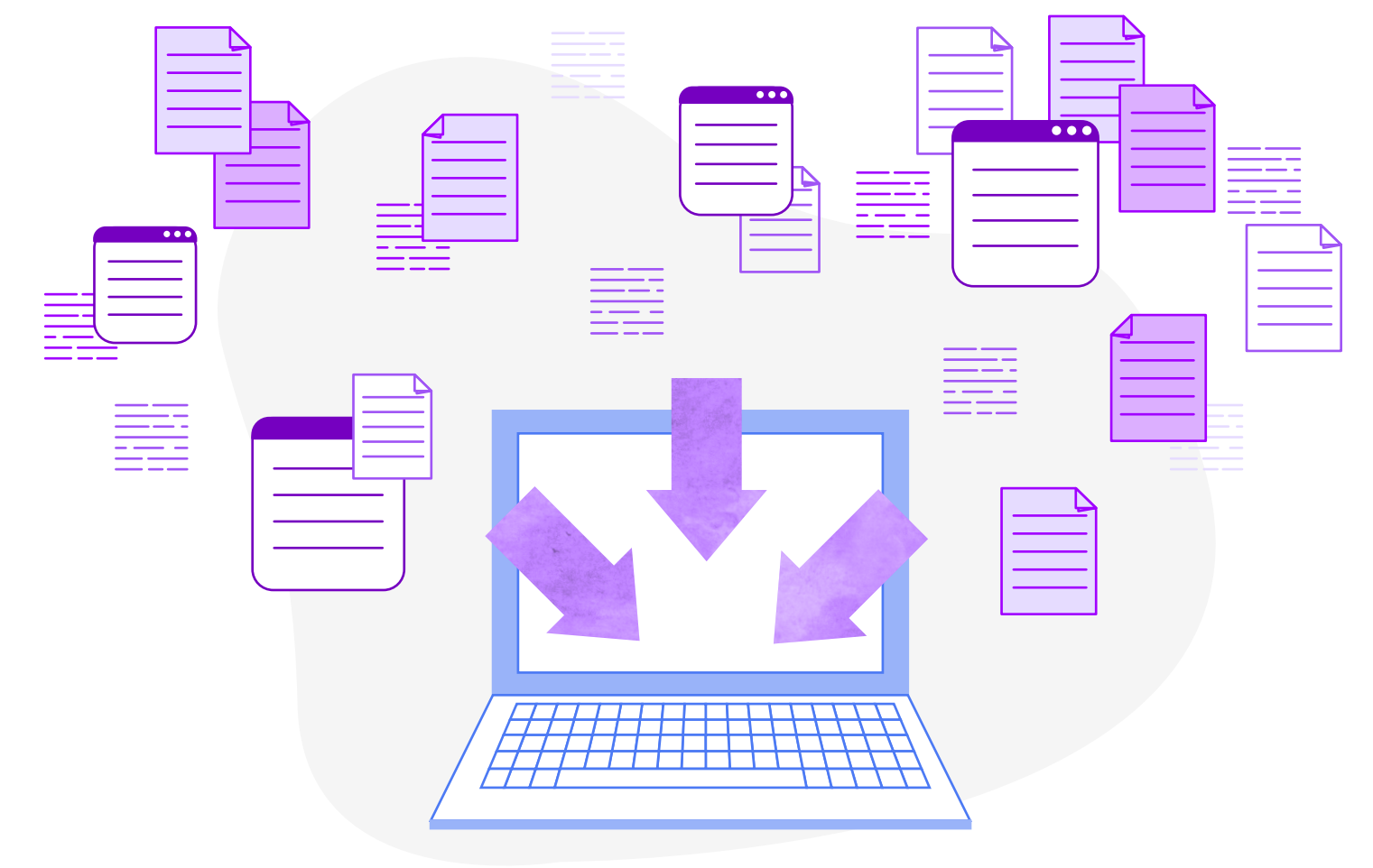
## Unified demand planning: Single source of truth for customer demand

Deeply understanding the source of demand—the individual customers—so it can be met most precisely has never been more difficult, with customer expectations changing rapidly and becoming more diverse. And as we saw in the early days of COVID-19, getting a good handle on demand during times of disruption is virtually impossible without the right information. The good news is that the data and AI-powered tools a company needs to generate insights into demand are now available. That's what unified demand is all about: integrating all of the available internal and external (and often real-time) data across every process and every function within an organization to completely transform the approach to forecasting and planning demand. With this new approach,

organizations ultimately establish a unified view of demand and a repeatable planning process that enhances accuracy and yields new insights to drive more meaningful decisions across the business.

For example, Accenture leverages internal data (e.g., from supply chain and trade), external data (e.g., consumption data, mobility, macroeconomic factors, brand sentiments, weather, and COVID-19 cases) and advanced algorithms to forecast consumption at a customer level and shipment at a location level. As a result, companies are better positioned to meet demand, avoid being surprised by disruptions or changes in conditions, and even eliminate unnecessary shipments and, thus, fuel use and emissions.

Unified demand underscores a truism throughout human history: Better information leads to better decisions—for customers and for the business.



Today, two converging factors are enabling companies to get this “better information” when it comes to forecasting what customers want to buy.

## Explosion of relevant data enables far deeper insights

Historically, when companies tried to understand demand, they had to rely primarily on their own sales data: what they’ve sold over what time horizon. This was useful, but incomplete. Consumer-focused companies have been able to improve their understanding of their end consumer with greater access to point-of-sale data from retailers and the emergence of syndicated market data—but they’re still falling short.

But now, thanks to the pervasive use of AI-powered solutions to help organizations capture and use that information, a whole new world of data has opened up for companies that can help them truly understand what influences demand at increasingly granular levels—and meet that demand more effectively, possibly predicting demand before customers even know what they want. For instance, ML algorithms learn demand patterns and predict what categories of products a consumer will need at a specific store based on relevant data, thus boosting customer satisfaction and loyalty.

## The cloud provides the mechanism for data collection and analysis

All this data that’s now available still wouldn’t be very useful if it couldn’t be collected and used. That’s where the cloud comes in. The cloud gives companies a platform for liquidity of information. It enables a company to access and consolidate a vast range of relevant data sources—both external and internal—triangulate the data it cares about, and make the data interoperable across business functions. Rather than individual functions (such as sales, marketing, finance, or supply chain) creating separate forecasts based on their specific data siloes, everyone can apply analytics and AI to the data to generate non-linear insights into what’s really influencing demand and how changes in certain elements—the weather, economic activity, and government actions, for instance—will affect it.

Armed with data-driven predictions, supply chain leaders can then more intelligently and proactively decide how they should respond to and meet demand, including determining what are the most appropriate actions to take in production, pricing, promotions, and fulfillment.

## End-to-end planning transformation

A global consumer goods manufacturer is seeing the benefits unified demand can generate by transforming its formerly manual, slow, and inflexible demand planning process. Accenture worked with the company to first assess the company's supply chain, using an ML-based accelerator to identify the various unique components of demand and isolating the key drivers behind each unique supply chain segment—insights that Accenture and the company then used to create a tailored supply chain strategy for each segment. In parallel, Accenture worked with the company to create new demand planning capabilities and a new operating model that use advanced algorithms and rich internal and external data, as well as a fundamentally redesigned demand planning process, **providing real-time visibility, a unified view of demand, and near-real-time scenario analysis.**

As a result of this end-to-end planning transformation, the company in just two years has boosted revenue by 1.5% due to greater customer relevance, reduced inventory by 20%, and cut costs by 10%.



## Supplier risk monitoring and resolution: Visibility across the supply chain

Deeply understanding demand is only half the battle. Gaining similar visibility into the full supplier base is also critical so a company can understand how its suppliers are performing and see potential risks across the supplier base.

We saw the importance of having greater visibility into the supplier base in the early days of the pandemic, which caused massive disruptions in supply in virtually every industry around the world.

Most companies couldn't see beyond a few major suppliers—they were effectively flying blind—so they couldn't know which suppliers were shut down or where orders were in the pipeline. It was especially difficult due to the global nature and complexity of most supplier bases.

But a company doesn't need a pandemic-sized disruption to knock a normally operating supply chain off kilter if the company lacks access to vital information. Even a relatively minor issue—for example, a delay in one shipment of raw material from a single upstream supplier—can be magnified across the supply chain, causing potentially huge complications further downstream as supplier after supplier—and, ultimately, the end customer—is affected. This so-called “bullwhip effect” has been known for

decades, but now the data and technology are available to finally do something about it.

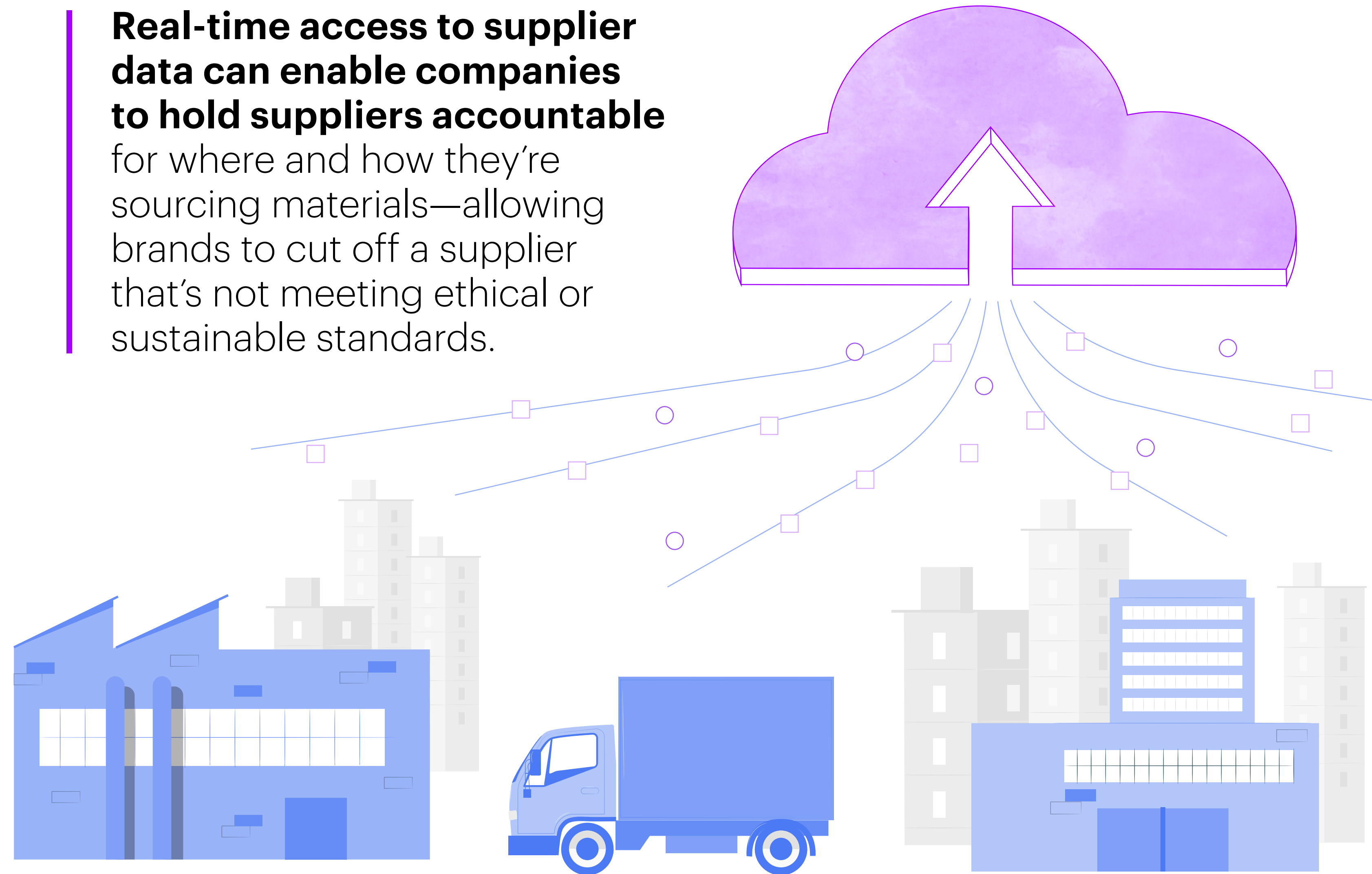
Analytics, AI, and the cloud play a powerful role here, enabling companies to continuously monitor and respond to disruptions within the multi-echelon supply chain. Just as we said about demand, having better information about what's happening throughout the entirety of the supply chain leads to better, more informed decisions.

For the first time, companies can actually capture data from across multi-echelon supply chains, consolidate it in the cloud, and apply robust AI models to it to give companies a real-time view into the state of their suppliers. With this data, companies can proactively identify where certain suppliers present risk—for instance, a supplier's shaky financial footing that could cause it to go under or a supplier's inability to source a vital raw material—and predict the resulting impact across the supply chain. Scenario modeling can then help a company identify the best alternatives so the organization is prepared if a disruption actually occurs.

And they can further their responsibility agenda by ensuring, for instance, that suppliers' carbon footprints are in line with agreed-upon levels and that suppliers are sourcing and producing materials in a sustainable and responsible way.

## Real-time access to supplier data can enable companies to hold suppliers accountable

for where and how they're sourcing materials—allowing brands to cut off a supplier that's not meeting ethical or sustainable standards.



## Mitigate potential supply risks

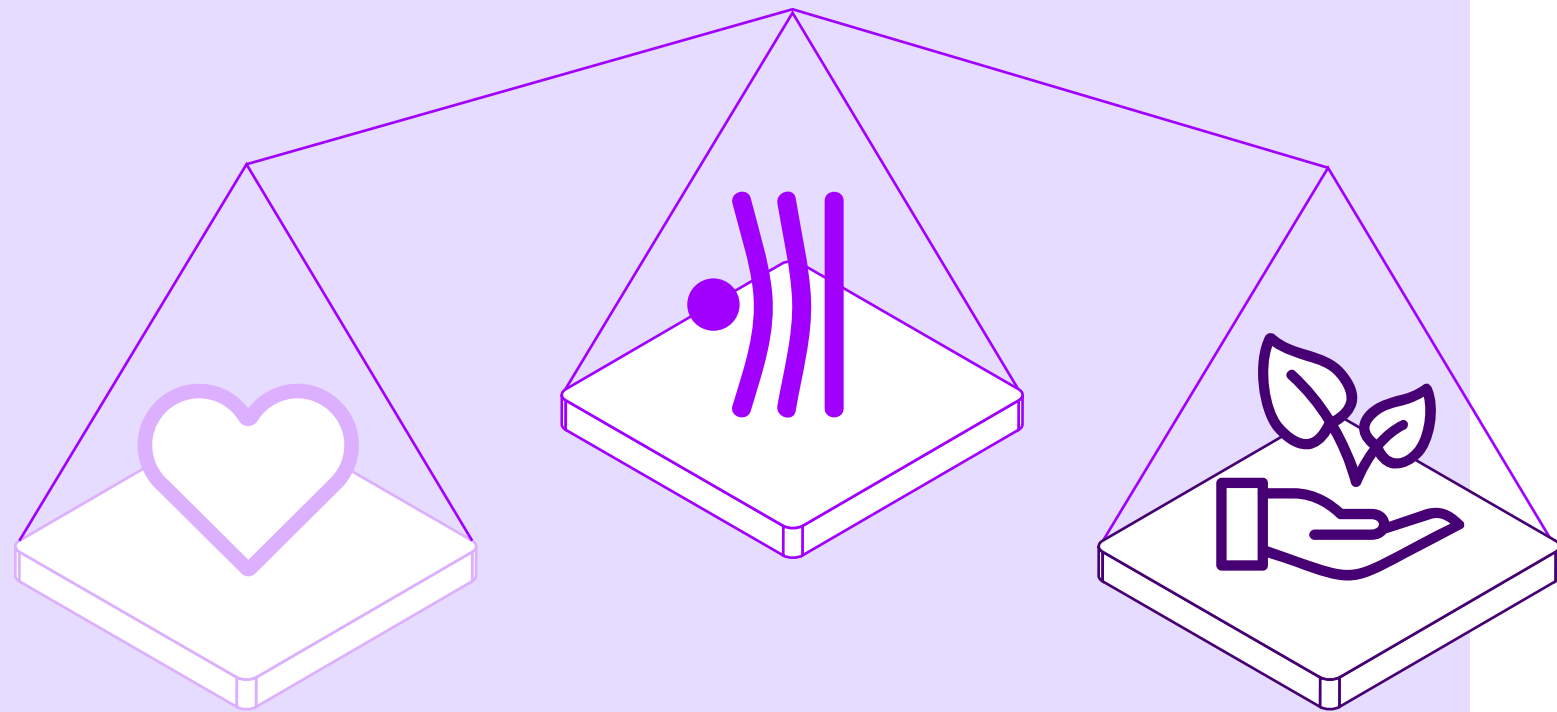
A global food producer was concerned about fluctuations in material availability, especially for sole-sourced materials from COVID-19-related countries. The company worked with Accenture to quickly develop and deploy an AI-based tool and related dashboard that enables the company to **mitigate potential supply risks**. The tool provides accurate visibility into inbound supply flows and risks caused by COVID-19 disruptions, as well as into inventory levels across locations; identifies root causes for the largest gaps between material forecast and actual production volume; and models alternative scenarios (based on simulations of inbound flows and production) for what to manufacture, and where, at a given point in time to ensure the company can meet fast-changing demand in the most responsible way possible.

With this tool and dashboard, the company could anticipate 80% of late purchase orders due to dashboard alerts and reduce inventory by 2 to 3%, which could translate into \$15 million to \$20 million in savings.



# Charting a path to a more relevant, resilient, and responsible future

In the past five years, **analytics and AI** have become increasingly **important** to many companies' business.



These powerful tools are enabling companies to automate tasks they never could before while providing much deeper insights companies can use to make faster, better decisions to improve business performance. And “business performance” today requires delivering simultaneously against traditionally competing KPIs like customer satisfaction, revenue, efficiency, cost control, and carbon emissions.

But companies so far have only scratched the surface of what analytics and AI make possible. Accenture research points to growing evidence of some companies that are now beginning to use these tools to help them do what used to be impossible: **become more relevant, resilient, and responsible—simultaneously.** These companies are demonstrating that the old tradeoffs they used to have to make when

considering these three outcomes are fading away, as human and machine collaboration becomes more pervasive. And, as our research also shows, striking the right balance across these outcomes is a winning formula for stronger growth and greater enterprise value.

Other companies need to step up their game to avoid being left behind. Focusing on a few key use cases—such as **scenario modeling, unified demand planning, and supplier risk management**—is a good way for companies to start infusing supply chain analytics and AI in their operations to inform every person and every decision across the business. They’re very manageable first steps that can put companies on a path to more intelligent operations that can help them effectively compete with organizations that are currently setting the bar.

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