

With changing customer perception and outlook, the drive toward sustainability in the automotive supply chain is continuously evolving into a stronger business case.

Resiliency and Sustainability Are Redefining the Global Automotive Supply Chain

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Introduction

The drive toward sustainability is taking center stage across several industries and, most importantly, in the mobility and automotive sector. To curtail greenhouse gas emissions from tailpipes, several developed countries around the world are setting targets for transitioning to zero-emission and sustainable transportation alternatives such as electric vehicles (EVs). The federal governments in these regions are also providing tax subsidies, incentives, and other initiatives to customers and auto original equipment manufacturers (OEMs) to promote domestic EV manufacturing and sale. Empowered by subsidies and incentives, most of the globally established auto OEMs are ramping up production and introducing a range of EVs at various price points, accessible to every consumer.

With widescale EV manufacturing, the auto industry value chain is under a major transition and is displacing some of the traditionally established supply chain channels and stakeholders with several new and emerging vendors. A new race is brewing between auto organizations and federal governments to forge partnerships and establish a value chain for sourcing rare earth materials and technology for battery tech, microchips, and power electronic hardware. These governments are also heavily investing and promoting these vendors to ramp up domestic production. However, these investments would require an extended period to mature and yield returns. Until then, there will be a high dependency on overseas vendors to source the necessary technology and cater to domestic demand.

Changing the Customer and Investor Perception of Auto Companies

IDC's 2022 *North America Auto Consumer Survey* indicates that over 70% of potential EV buyers in the region for the next three years will belong in the 17-45 age group. Most EV users today belong to a younger demographic who choose products and services over others based on how well companies are viewed in support of their values such as clean energy, ethical sourcing, and environmental equity. Auto companies have to take account of these shifts and rethink their position on sustainability initiatives to attract this young demographic of EV buyers. With a range of EVs anticipated to enter the market in the immediate future, customers' perception of auto companies based on the OEM's commitment to sustainability is becoming a key differentiating factor when choosing an EV brand. Also, environmental, social, and

AT A GLANCE

KEY STATS

The top technologies for automotive manufacturers looking to support a resilient supply chain in three years are as follows:

- » Big data and analytics — 39%
- » SaaS/cloud applications — 32%
- » IoT/RFID (use of sensors) — 32%

governance (ESG) factors are impacting all industries as investors are increasingly applying these nonfinancial factors as part of their analysis process to identify risks and growth opportunities. Institutional credit rating companies are now providing credit scores for auto companies based on their sustainability initiatives; these scores are intended to inform their investor base. Hence, the drive toward sustainability across auto OEMs' value chain is no longer limited to an ethical use case and is continuously evolving into a stronger business case.

The key facets for driving sustainability in the automotive value chain include the materials employed, manufacturing carbon footprint, and procurement and delivery activities across vendor and dealership networks. IDC research indicates that the emphasis on sustainability and total carbon footprint for an auto company can be addressed effectively by transforming the supply chain processes. This includes sourcing raw materials, procurement of parts from the vendor network, and both inbound and outbound movement of products across the dealership network. One effective strategy to promote sustainability in the automotive supply chain is choosing low-emission and energy-efficient options for goods transportation. For overseas transport, OEMs can opt for ocean freight over air freight services, which is more cost effective and has a much smaller carbon footprint. However, to effectively leverage ocean freight-based procurement services, there is a need for enhanced visibility across all the stakeholders involved at every stage while considering all the variables that may lead to disruptions. This requires estimating and planning procurement and delivery activities at a high level of accuracy by leveraging digital tools and artificial intelligence (AI).

Vulnerabilities in the Existing Automotive Supply Chain

The resurgence in travel for work, post-pandemic, and the fuel price volatility are leading drivers for the high EV demand. However, several of these orders could not be fulfilled, leading to tremendous backlogs, extended delays, and higher expenses and subsequently leading to higher price tags for the customers, hampering the overall growth of the auto market. The mismatch in supply and demand was witnessed both upstream and downstream the OEMs' supply chains. Acute microchip shortages led to prolonged delays in the delivery of new cars, with tens of thousands of new vehicles sitting in parking lots awaiting semiconductor chips. In many instances, auto OEMs were forced to roll back a few electronically controlled vehicle features to ration the limited chip supply. The lack of supply also led to inflated price tags as dealers were marking up the available stock, leading to customer discord and hampering the brand's reputation.

The aftermath of the global pandemic exposed several existing flaws and vulnerabilities in the supply chain. In addition, the Russia-Ukraine War has further exacerbated the situation, leading to higher costs for raw materials and procurement expenses. The upheaval in the global supply chain still remains a significant roadblock for several auto OEMs. With increasing dependency on new and emerging vendors, it is crucial for OEMs to have enhanced visibility across all supply chain and logistics activities and to be resilient in case of future disruptions.

Addressing Vulnerabilities with a Digital Approach

The underlying, often uncalculated, and frequently neglected risk of global supply chains has been exposed in recent years by a series of disruptions. This string of events resulted in persistent congestion, creating significant challenges for organizations that depend on the continuous flow of goods from global suppliers through complex logistics networks to support their business. Because of their unexpected nature, so-called black swan events have caused significant heartburn, which only multiplied for those whose responses to these incidents were delayed, thus compounding their difficulties to effectively navigate this dynamic and unpredictable environment.

Automotive manufacturers, in particular, have suffered through painful cost overruns and material shortages, according to the IDC's 2022 *Supply Chain Survey*. Among the respondents to the survey, 53% said they suffered supply chain

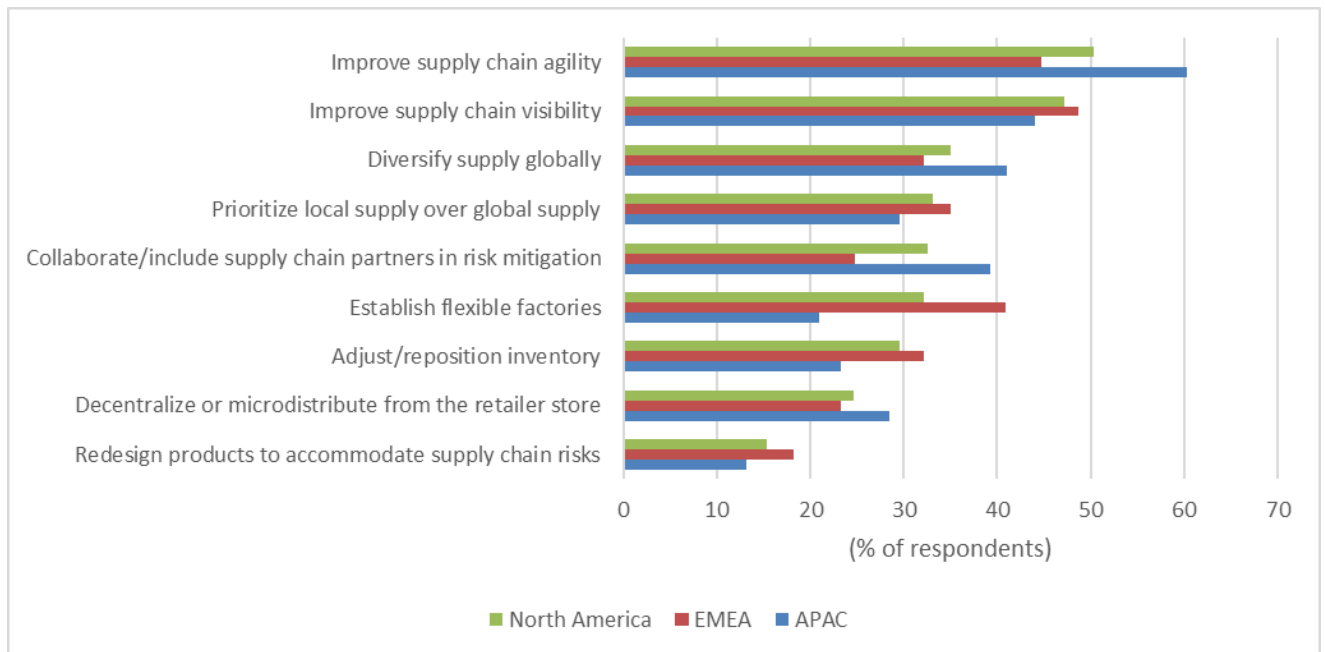
execution problems, 48% reported experiencing supply cost increases, and 36% reported incurring inventory shortages or having inventory in the incorrect location.

The extended disruption of this environment emphasized the importance for automotive manufacturers to work toward increasing visibility and collaboration with suppliers, tier 1 and beyond, to better manage risk across a diverse supplier base. Data-based insights enable optimal planning processes for automotive manufacturers that are focused on cultivating resilient supply chains by diversifying supply channels, according to 47% of respondents at tier 1 and 16% of respondents below tier 1 (source: IDC's 2022 *Supply Chain Survey*, n = 101).

At the same time, the push for increased resilience across global supply chains is being countered by changes to global economic conditions, forcing businesses to balance the drive for resilience with the need to continuously strive to generate efficiencies. Efforts to drive out costs, discover opportunities for growth, and advance sustainability initiatives must be reconciled with data that is generated by advancing digital transformation across the supply chain. As automotive manufacturers focus on increasing organizational agility, the ability to increase end-to-end (E2E) visibility of components and commodities requires increased collaboration with partners to mitigate supply chain risk across and between regions (see Figure 1).

FIGURE 1: **Steps to Mitigating Supply Chain Risks**

Q What steps are you taking to mitigate risk in your supply chain?



n = 1,109

Source: IDC's Global Supply Chain Survey, 2022

Digital transformation helps auto OEMs create a foundation of data to better understand how their supply chain is performing and objectively assess this reality against their stated goals for increasing agility and controlling costs.

Extending visibility provides the foundation from which teams can begin to support increasingly diverse and flexible global procurement footprints that are becoming a priority for these global businesses.

Systems in place today, if they exist at all, are primarily homegrown, are Excel dependent, and are not comprehensive solutions that support large international corporations. The technology must be capable of managing complex global sourcing footprints to effectively support collaboration and growth with supply chain partners.

Digital Transformation Makes Complex and Evolving Global Supply Chains Connected, Intelligent, and Secure

Increased collaboration across product development extends throughout the supply chain, putting even greater emphasis on the creation of long-term partnerships as a strategic priority where tradeoffs are understood and transparently communicated between supply chain partners. A "set it and forget it" procurement strategy is no longer effective as it leaves auto OEMs unnecessarily exposed to risk. The ability to continuously evaluate and adjust aids the development of a resilient supply chain with the capacity to address disruptions effectively, whether local, regional, or global in scale.

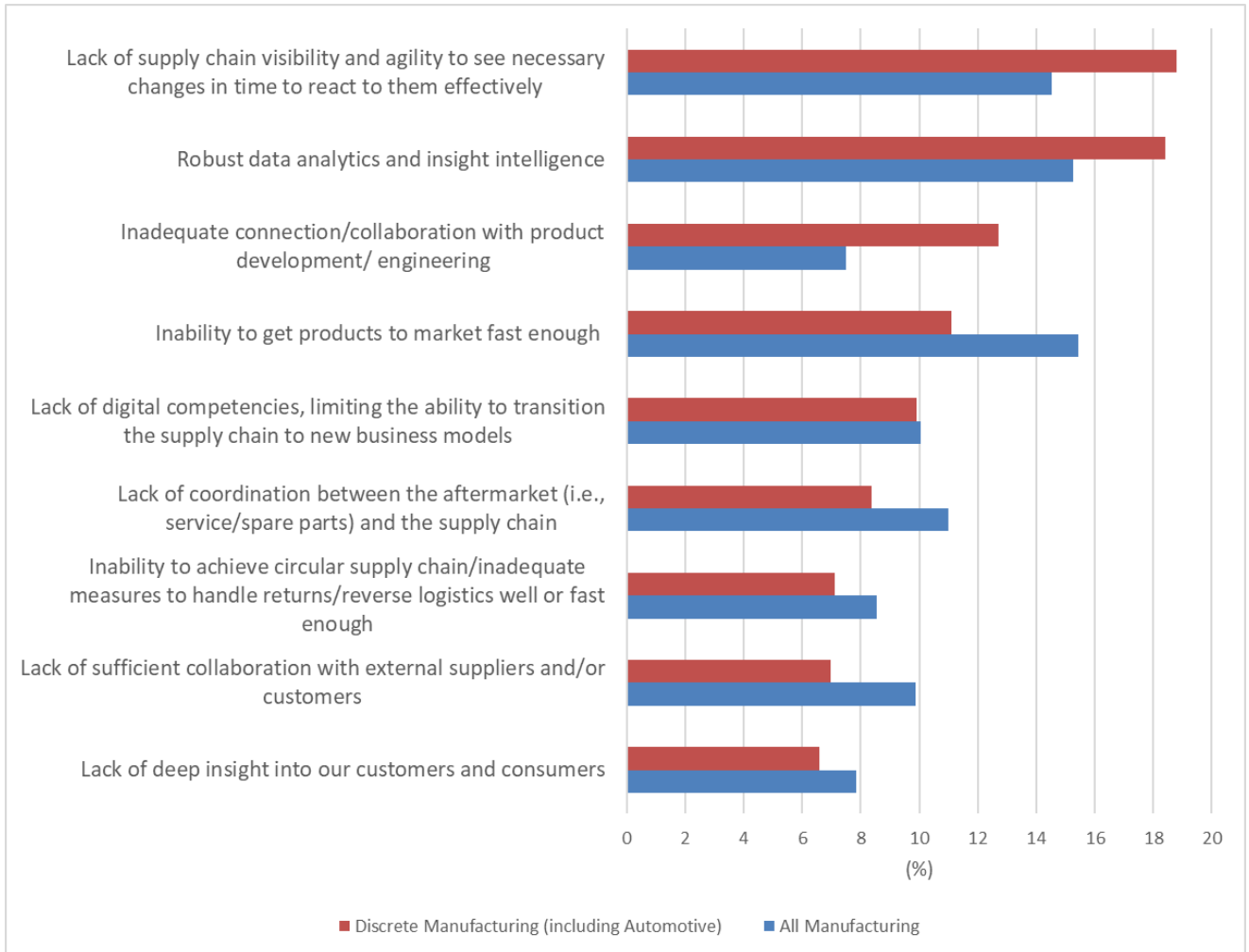
These needs for resiliency are particularly pronounced for auto OEMs where highly engineered products with increasing complexity blur organizational lines. We see this even more so in terms of the transition to EVs as manufacturers address chip shortages, compete for rare earth minerals, and increasingly depend on integrating suppliers into product design and improvement.

Further, the growing relevance and focus on sustainability also depends on economic viability and increasing collaborative efforts with supply chain partners if the progress is to be lasting. Tracking, monitoring, and promoting ESG progress includes capturing and monitoring the carbon footprint, primarily emissions, but also extends to ethical sourcing, economic inclusion, and improving safety across the value chain.

Advancing these initiatives in concert with extreme weather events, geopolitical shifts and conflicts, strained labor forces, and the looming threat of congested logistics networks requires addressing visibility and analytics gaps across manufacturers' supply chains (see Figure 2).

FIGURE 2: *The Most Pressing Supply Chain Gaps*

Q As you think about the future of your supply chain, what is the number 1 gap that is likely to be the most problematic if not addressed?



n = 149 (discrete manufacturing), n = 591 (all manufacturing)

Source: IDC's Global Supply Chain Survey, 2022

Cultivating intelligence across the supply chain allows teams to become predictive where possible and to respond quickly where not possible. This is increasingly important when operations rely on fragmented logistics networks where access to resources is not guaranteed. The push for resilience demands an evidence-based approach to make pragmatic decisions where trade-offs are understood and effectively communicated across partner networks.

IDC defines supply chain resilience as visibility + analytics intelligence + agility. Teams must be able to "see" into and across their supply chain, they need the analytics horsepower to continuously reevaluate these conditions for optimality, and they need the ability to swiftly act upon insights once uncovered. The top technologies that automotive

manufacturers are looking for to support a resilient supply chain in three years are big data and analytics (39%), SaaS/cloud applications (32%), and IoT/RFID (32%), according to the IDC's 2022 *Supply Chain Survey* (n = 149).

Beyond visibility, agility, and data analytics, automotive manufacturers are improving resilient operations by more deeply integrating with their suppliers. This increased collaboration bolsters existing interdependencies and strengthens the system of systems that has been cultivated over the years and on which their dependence has grown. Examples are including suppliers of raw materials that are critical to production, engaging suppliers during product development, extending demand forecasting through tier "n," managing the risk of commodity prices and capturing into contracts by utilizing market data, integrating sustainability (emissions and social aspects) into the procurement discussions, and engaging in "what if" scenario planning.

Benefits

Advancing digital maturity across the supply chain provides the framework by which automotive manufacturers can appropriately contextualize data and begin to objectively and dynamically balance resilience and efficiency across their operations and their supply chain partners. Digital tools capable of cultivating insights by consistently and continuously evaluating parameters for optimality encourage collaboration, build trust, and support efforts to advance sustainability cohesively between supply chain partners.

Timely and actionable insights allow supply chain leaders to navigate an increasingly complex global landscape to improve planning/demand insights, optimize inbound/outbound logistics, and proactively mitigate disruption in support of continuous operations. Gaining early visibility to delays/issues enables teams to realign network models to address service-level variability, thus reducing the reliance on costly (financially and environmentally) modes of expedited transportation.

As supply chain teams revisit inventory strategy and placement, considering the just-in-case (JIC) standard as a potential alternative to the just-in-time (JIT) standard, many factors must be taken into account for procurement footprints that are large in depth and breadth such as in automotive manufacturing. The answer is likely different for each component, supplier, and trade lane being evaluated. Achieving optimality across these complex and intertwined networks is a significant challenge that a supply chain ecosystem supports to maintain efficiencies while avoiding lost sales, missed production targets, or damage to reputation.

Constant refresh and reevaluation of which parameters are relevant to success provide teams with the foundation to shift between alternative planning strategies as they strive to achieve operational and financial objectives. Incorporating a drive for sustainability can be effectively integrated alongside these efforts by transparently measuring and communicating progress while avoiding greenwashing.

Collectively, pursuing these initiatives objectively allows teams to transform their supply chain from being viewed as a cost center to value creator. It begins with generating visibility across extended supply chain networks in as close to real time as possible. Feeding this data into analytics (AI/ML) models creates supply chain intelligence, cultivating actionable insights on which supply chain leaders can take timely decisions. This benefits auto OEMs as capabilities develop to objectively manage risk around volatile commodities, reduce costs to generate savings, improve their ability to execute within complex logistics networks, and support growth objectives by improving collaboration with their supply chain partners and facilitating the holistic management of E2E supply chain operations.

Considering Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business through the deployment of technology. The company is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. Capgemini aims to be a responsible and diverse organization with over 360,000 team members who operate in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is engaged by its clients to address the entire breadth of their business needs, from strategy to design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering, and platforms. The company reported global revenue of €22 billion in 2022.

Challenges

Data security is top of mind for manufacturers operating in complex, global networks. Fortunately, "more robust security and data protection" was the top response for automotive manufacturers when asked what benefits they have seen from cloud/SaaS deployments in their supply chain (source: IDC's 2022 *Supply Chain Survey*, n = 149). Adjusting an organizational mindset toward this fact may be a challenge that some teams face when attempting to move from on-premises systems into a robust cloud environment that can support the data collection, analytics, and insights generation to establish visibility and resilience across global supply networks.

Ensuring data hygiene and retaining the appropriate context is also a significant challenge when attempting to bridge data across numerous auto OEMs, geographies, and systems. Ensuring an accurate and consistent view and a single source of truth across supply chain stakeholders allows teams to begin operating from the same playbook. Setting the stage for teams to begin pulling in the same direction is a significant challenge, one that management can help address by appropriately setting the stage for openness, trust, and collaboration between teams and promoting the tools and systems that can deliver on these promises. Leadership is critical in this regard to ensure that mutual interests are communicated openly and can be pursued by practitioners toward the mutual benefit of automotive manufacturers and their extended supply chain partners.

The push for resilience demands an evidence-based approach to make pragmatic decisions where trade-offs are understood and effectively communicated across partner networks.

Conclusion

The push for resilience demands an evidence-based approach to make pragmatic decisions where trade-offs are understood and effectively communicated across partner networks. With the constant disruption of global supply chain networks, resilience will remain a top priority for automotive OEMs. As companies shift and diversify their procurement footprints in response to geopolitical realignments and the desire to address the risks associated with single-sourced commodities and components, supply chain networks need ongoing support for optimal management. Systems that support a continual refresh as conditions change on the ground increase organizational agility by allowing teams to become predictive in the face of future disruption or by being able to more quickly respond when the unforeseeable occurs. As sustainability metrics become increasingly incorporated into business decisions, the ability to effectively calibrate supply chain operations with the overarching organizational strategy helps organizations build brand equity and loyalty. The changing perception of EV buyers and investors toward sustainability will have a major impact on global automotive brands. Realizing the shift, several major auto OEMs have already announced their targets and goals to

become carbon neutral across the value chain. By effectively leveraging the power of data with digital transformation technology and AI, auto OEMs can further optimize supply chain operations, reducing overall energy consumption and associated cost.

About the Analysts



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Travis Eide is the research director of IDC's Worldwide Supply Chain Strategies program, responsible for providing research, analysis, and guidance on key business and IT issues pertaining to manufacturing, retail, and healthcare supply chains. He currently leads the Worldwide Supply Chain Strategies: Transportation, Logistics, and Global Trade Management practice, providing fact-based research, analysis, and insight on best practices and the use of information technology to assist clients in improving their capabilities in these critical supply chain fulfillment areas.



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MESSAGE FROM THE SPONSOR

How Capgemini Works with Clients to Orchestrate Their Journey to a Resilient and Connected Supply Chain

We are in the era of automotive disruptions including globalization, EV, and autonomous vehicles. Capgemini with the strong capabilities of automotive industry experts, supply chain capabilities, and strong IT and OT capabilities thrives to orchestrate and enable resilience in the automotive OEM supply chain across the global marquee OEM and tier 1 clients. To complement these services, Capgemini also addresses the following through Capgemini's automotive supply chain offer:

- » Build supply chain resilience in automotive organizations.
- » Enable value with IT and OT aspects to bring in multiparameter tracking.
- » Enable sustainability in the supply chain from tier 1 to tier n.
- » Build data- and insight-driven planning to enable optimization and sustainability with waste reduction and efficiency enhancement.
- » Bring in visibility across the supply chain to enable faster, cost-effective, and sustainable business decisions.

For more details, contact Roshan Batheri at roshan.batheri@capgemini.com and Pascal Feillard at pascal.feillard@capgemini.com.



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