

Visibility, agility, and resiliency in supply chains have always been important, but these characteristics are taking on a profoundly more critical role in an increasingly disruptive world.

Supply Chain Resiliency in a Time of Disruption

July 2022

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Introduction

Over the past couple of years, supply chains have experienced a bumpy ride. Shortages have been pervasive — sometimes a result of supply disruptions, sometimes a result of demand spikes, and sometimes both. As a result of these factors and transportation and global trade capacity issues, supply chains are experiencing pressures unlike any we have seen in a generation.

Those who have both studied and operated supply chains for decades have always talked about the importance of visibility, agility and resiliency, but these terms are now on the tip of everybody's tongue and are taking on a profoundly more important role in an increasingly disruptive world. Indeed, IDC defines resiliency as visibility plus agility. It is not enough to be able to see what is happening, thus the visibility; the supply chain must be able to do something about it, thus the agility. Although resiliency is not something that can be achieved overnight, there are things that can be done in the shorter term to better understand the drivers of demand volatility and allow companies to better match supply with demand. When both supply and demand are highly volatile, supply chain planning with both suppliers and customers is critical. Indeed, in IDC's 2022 *Supply Chain Survey*, 83% of respondents noted that the pandemic has increased the IT investment priority for the supply chain.

Now it is "easy" to see that resiliency is critical, but seven years ago, IDC was suggesting that supply chain resiliency could well be the most important characteristic of the modern supply chain. Although the pandemic has had a global impact, regional disruptions both prior and since have many of the companies IDC speaks with prioritizing risk assessment and resiliency much more highly than we had seen at any point in the past 20 years. Yet those same companies confessed that it remains a challenge to detail the business case and justify the return on investment — and to build the internal capabilities necessary to be truly resilient. It is not enough to have clarity into supply chain risks, though that is an important consideration; it is also important to be able to take the necessary corrective steps, dynamically respond if you will, both proactively and reactively, to ensure that disruptions do not persist and "time to recovery" is optimized.

In a supply chain survey fielded by IDC in April 2022, when asked about the gaps most problematic for the future of the supply chain, respondents identified lack of resiliency as the top gap. In other words, without a resilient supply chain, survey respondents felt that they would be at a competitive disadvantage. Figure 1 details the top 5 responses.

AT A GLANCE

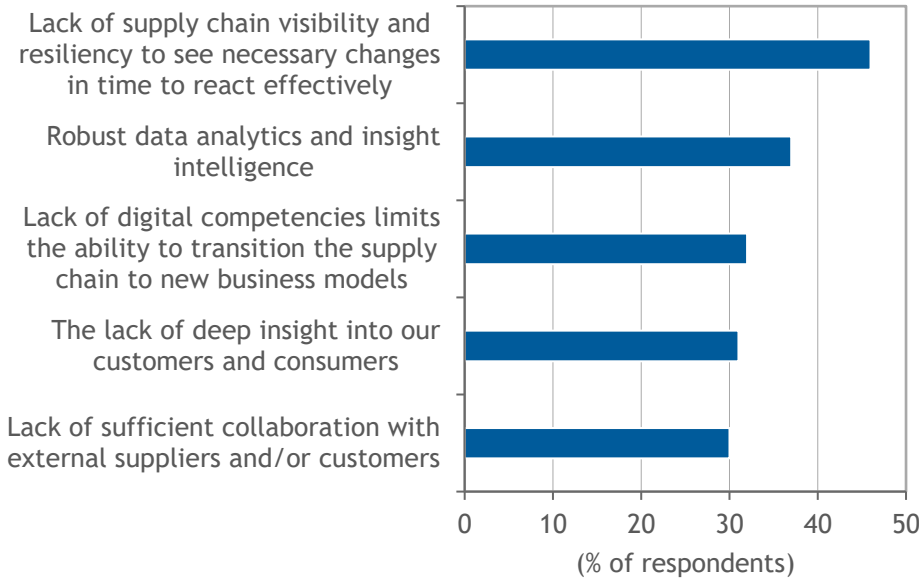
WHAT'S IMPORTANT

Top technologies for achieving resiliency in the supply chain are as follows:

- » Scalable analytics
- » Cloud platforms/cloud applications
- » Internet of Things
- » Robotics
- » Artificial intelligence
- » Blockchain

FIGURE 1: **Critical Gaps in the Supply Chain**

Q What are the most important gaps that, if not addressed, will materially affect your supply chain?



n = 1,109

Source: IDC's Supply Chain Survey, 2022

IDC is often asked what it is that will define the best-in-class supply chains of the future. Our answer is that it will be companies that utilize the massive breadth of data available to organizations for resilient decision making. Now more than ever, the ability to leverage information across the extended enterprise will be the critical capability that will require modern digital competencies as noted in Figure 1. Companies with disconnected supply chain systems and capabilities will simply not be able to do this well and will not be resilient. In an inherently disruptive world, the supply chain must be able to make the right strategic decisions efficiently and effectively. This means responsive supply chain processes that can sense changes and respond to them in real time.

Supply and Demand Shocks

Although most of the discussions about the supply chain have remained focused on supply disruptions (e.g., automotive parts factories closing in Wuhan, China, or meatpacking plants closing in the U.S. Midwest), IDC believes that demand disruptions are not getting enough attention. Over the past couple of years, manufacturers have found demand forecasting to be particularly challenging as many of the historic trends no longer apply and consumer behaviors as a consequence of the pandemic continue to shift.

At IDC, we had more inquiries into demand planning in 2021 than in any prior year on record, and those inquiries continue at a steady pace in 2022. The nature of these inquiries is remarkably consistent, as manufacturers lament the problems they face in forecasting demand. While some manufacturers are quite sophisticated in terms of the tools and processes used to arrive at a consensus forecast, many more use historical shipments as a major input. This latter approach to forecasting is not useful in an environment where the historical precedent is from 1918.

While part of the answer is to adopt modern technologies within supply chain planning (though even some of the companies doing so are struggling to produce a good forecast), it is also important to begin to understand and utilize other kinds of data to inform the forecast. Indeed, thinking outside the box for new data sets such as disruption triggers and socioeconomic trends is likely to be important for the future of supply chain planning. In addition, the ability for manufacturers to be agile and respond quickly to demand forecast variations has just become much more important.

The reality is that whether fulfilling supply or demand, all manufacturers (and retailers) must adapt their supply chains to operate in a fundamentally more disruptive world. In the past, disruptions have tended to be regional, and while the initial reactions have been replete with professed urgency to change existing practices, all too often that urgency passes with time and resumption of normalcy. COVID-19 is the first global disruption in decades, and while it too may pass into history with a whimper, it continues to feel different. Perhaps it is unreasonable to expect the global manufacturing industry to be able to turn on a dime for an event that occurs once in a century. The "carrying" costs of flexibility and large inventories of things that degrade over time, two costs that rise during a pandemic, are high. COVID-19 has exposed a material lack of visibility, flexibility, and adaptability that should be inherent to the industry.

In the short term, supply chains should implement business continuity assessments to evaluate the recovery requirements of both supply and demand as well as look across the entire network of suppliers (components/ingredients, OEMs, logistics, finished goods) and customers and adjust the process based on the significance of the partner. Risks, disruptions, and inevitable changes must be included as part of the collective business, product, and supply chain planning and design process.

The ability to model various scenarios in the short term and effectively plan for them requires the full power of an integrated supply chain planning platform with modern technologies (e.g., cloud, artificial intelligence/machine learning, analytics, ecosystem networks) working in concert with both upstream and downstream IT systems that support product development, procurement, supply chain planning, supply chain execution, and post-sale service execution. To capitalize on the "next new normal" in the longer term, organizations should revisit, modernize, and create local as well as global supply chain contingency plans by leveraging the full span of digitized tools, which includes modern robotics, drones, and automated vehicles integrated into intelligent operational systems as part of flexible and dynamic workflows.

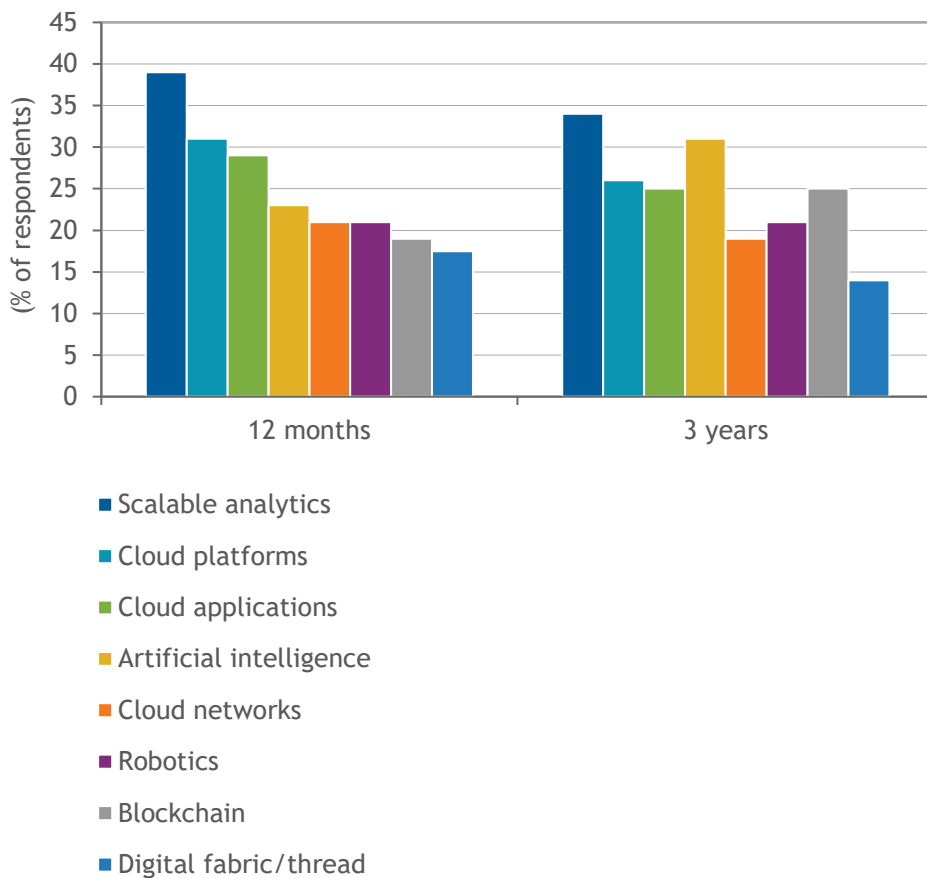
Supply Chain Resiliency

At IDC, we are talking both with clients and within our research about the notion of supply chain resiliency. For the supply chain to be resilient, it must have both visibility and agility. It is not enough to be able to see; the supply chain must also be able to act. It is not enough to be able to act; the supply chain must see where and how to act. Thus, visibility plus agility equals resiliency.

For both supply chain planning and supply chain execution, the supply chain must see what is happening (or about to happen) in real time and be able to react in an efficient and effective manner. A supply chain that sees something in advance but is relegated to being a spectator to an unfolding catastrophe is not resilient. In IDC's 2022 *Supply Chain Survey*, 80% of respondent companies said that they have projects within their supply chains to improve visibility and 90% have projects to improve agility. Revolving around the use of data and the adoption of ecosystem networks, these efforts are a blend of supply chain planning, end-to-end supply chain, and distant tier supply. Agility is also an important focus with initiatives concentrated on agile inventory management, "smart" procurement, and manufacturing flexibility.

Although we must not forget about people and process, the role for technology and automation in a resilient supply chain future is critical. Figure 2 notes the importance of technology to supply chain resiliency both in the near term and in three years. The use of scalable analytics, modern cloud platforms, and multi-enterprise supply chain networks that can harness the power of ecosystems speaks to an information insight-driven future where data sits at the center of the best-in-class supply chain, where the primacy of technologies make sense. Artificial intelligence is critical both to more effectively harness the breadth and depth of data and to help control data quality and extract insight from that data. Blockchain, while not a data quality technology, is a data integrity technology and can help control data degradation.

FIGURE 2: *Achieving Resiliency — Use of Technology*



n = 1,109

Source: IDC's Supply Chain Survey, 2022

Referring back to Figure 1, we note that for the foreseeable future, the reality is that companies that invest in resiliency and digital competencies will outperform those that do not. The impact of COVID-19 seems likely to persist at least through 2022, perhaps longer. If the "last" normal was about the supply chain reacting to COVID-19, the "next" normal looks like it will be about adapting to COVID-19. What the next "next" normal looks like after 2022 remains to be seen. Although it is possible that the supply chain will return to its pre-COVID state, it seems much more likely that we will see some fundamental, structural changes. At the core of those changes will be the adoption of far broader and deeper

modern supply chain planning that requires both comprehensive visibility and much closer connection to key suppliers, manufacturing, and logistics as well as broader adoption of technology to enable automation.

Part of making the supply chain resilient means ensuring that the organization can manage across the four Ws: weather, war, workers, and "w"egulation. In the case of COVID-19, the impact has been mainly on workers. Although we have seen significant inroads of automation in the supply chain, factory and distribution operations still rely materially on people. Supply chains will always, and should always, rely on people for most decision-making and service tasks. There are, however, many rote or repetitive tasks that are better handled with automation. Whether organizations are assessing maintenance issues with drones, moving inventory around warehouses with automated guided vehicles (AGVs), or even using driverless vehicles for certain transportation routes, part of resiliency is having ways to manage the operation of the supply chain through automation should people be a limitation.

Benefits

In early 2022, IDC conducted a survey focused specifically on the state of resilience in the supply chain and defined supply chain processes and technology maturity dimensions as part of that assessment. Broadly, the less mature stages of supply chain resiliency tended to be characterized by siloed or highly reactive behaviors, while the more mature stages tended to be characterized by predictive or even prescient behaviors. Mature supply chains were more likely to look at supply chain process planning globally, were highly collaborative both within departments and across the entire organization, and had a more progressive view of the use of people/process versus the use of technology.

IDC saw a similar story when assessing the maturity of technology. Companies that had prioritized resiliency in their technology investments were materially more mature than those that had not. Indeed, the more technologically mature companies had widespread adoption of key technologies, systems-driven communication and collaboration, and enterprisewide supply chain planning and execution. They had prioritized full integration between internal applications and significant integration with both upstream and downstream trade partners to ensure applications were purpose designed to address risk and support resiliency.

In 2022, technological maturity is more important than ever. If organizations cannot see what is happening and respond quickly, they will not be resilient. Companies that have embraced supply chain resiliency using an integrated supply chain capability and multi-enterprise networks with upstream and downstream collaboration indicate a broad range of benefits. These capabilities do not just happen, and many established supply chains are finding themselves poorly positioned to compete in a fast, highly disruptive environment. Supply chains that successfully enable visibility and agility, adopt comprehensive analytics, and employ cognitive technologies will have a step up on competitors that do not. Benefits that drive significant business capabilities include the following:

- » **Superior financial performance.** IDC estimates coupling analytics and resiliency to extract broader financial insights will be worth 3–5% of incremental revenue as well as a 2–3% margin for industry leaders.

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- » **More effective innovation delivery.** IDC estimates resiliency enables a 10% systemic reduction in innovation costs and a 30% reduction in new product lead times.
- » **Less system disruption and/or better response.** Digital commerce networks, advanced analytics, and better integration of demand and supply networks can cut supply chain recovery time by 50%.

Considering Oracle

Oracle provides a comprehensive and integrated supply chain planning application suite on a single cloud platform. It supports an end-to-end supply chain model that improves the quality and speed of decision making while allowing companies to segment their response based on business objectives for short-term agility and long-term resiliency.

Oracle Fusion Cloud Supply Chain Planning includes Demand Management, Supply Planning, Sales & Operations Planning, and Supply Chain Collaboration cloud services.

Oracle Fusion Cloud Demand Management combines forecasting algorithms with flexible analytics to anticipate customer demand. The cloud-based demand management solution gives organizations immediate feedback on new products, business segments, and customer behaviors, along with time-phased replenishment requirements, so that organizations can seize opportunity from change.

Capabilities of Oracle Demand Management include the following:

- » Multi-dimensional demand modeling that adapts to the business
- » Top-down and bottom-up forecasting
- » Flexible time buckets, units, and currencies for operational and financial planning
- » Capturing of internal and external data for short- and long-term planning decisions
- » Identifying demand patterns and changes via real-time updates across multiple time horizons
- » Monitoring changes in demand signals via exceptions and notifications
- » Bayesian forecasting engine that handles multiple causal factors and applies machine learning to enhance results
- » One-click baseline, seasonal, trend, and causal factor analysis
- » Supervised learning that identifies predictive features and recommends the best forecast including new product introductions
- » Configure-to-order (CTO) product planning
- » What-if scenario analysis and simulations to changes in forecast models and parameters
- » Collaboration capabilities to reconcile cross-functional forecasts
- » Automated demand-driven inventory replenishment and rebalancing

Oracle Fusion Cloud Supply Planning is designed to give organizations simpler, faster, and better ways to tactically plan for and execute operations strategy. The supply planning solution detects issues, prioritizes competing demands, and intelligently reschedules and reroutes global supply to minimize disruptions and take advantage of opportunities as they occur.

Capabilities of Oracle Supply Planning include the following:

- » Plan a global supply chain across multiple tiers
- » Calculate statistical safety stock requirements
- » Generate supply plans that include outsourced manufacturing and upstream suppliers
- » Plan process, discrete, and mixed-mode manufacturing
- » Dynamically prioritize and reschedule demands based upon business requirements
- » Automatically evaluate and address material and capacity constraints
- » Use guided resolution and recommended actions to address demand at risk and ensure order fulfillment
- » Analyze exceptions, determine root causes, and automatically adjust supply as needed
- » Model what-if changes to capacity, demand, supply, and items
- » Review manufacturing and IoT predictions with recommended actions to improve operational efficiency
- » Compare the effectiveness of alternative plans
- » Generate and monitor factory schedules to optimize resources and reduce changeover time
- » Release the best plan for execution and cancel or reschedule supply orders as needed

Oracle Fusion Cloud Sales & Operations Planning (S&OP) helps organizations consistently and profitably execute on their strategy, aligning operations on a common set of forward-looking metrics and a shared operating plan for achieving objectives. When it's time to move plans into execution, S&OP from Oracle helps translate S&OP decisions into tactical plans and continuously monitor performance to ensure operations stay on target.

Capabilities of Oracle Sales & Operations Planning include the following:

- » Leverage prebuilt and configurable process templates for best practices and quick adoption
- » Promote S&OP collaboration with inline simulation for consensus forecasting
- » Aggregate planning using bills of resources for strategic capacity and supply plans
- » Monitor plans, late activities, and tasks across the business using prebuilt analytics and reports
- » Connect S&OP with overall business planning and quickly move consensus plan into supply chain execution

Oracle Fusion Cloud Supply Chain Collaboration helps organizations increase supply visibility, automate vendor-managed inventory practices, and secure supplier commitment to order forecasts, thus driving more responsive trading relationships.

Capabilities of Oracle Supply Chain Collaboration include the following:

- » Manage a multi-tier network of trading partners with a portal-based user interface, B2B message interchange, or a web services library
- » Plan demand and supply with trading partners and coordinate on supply chain execution
- » Support collaboration upstream and downstream across orders, forecasts, production, and vendor-managed inventory
- » Monitor and respond to challenges such as spikes in demand, order delays, and supply shortages

All of Oracle's supply chain products are designed to optimize an organization's ability to quickly respond and pivot in a dynamic supply chain ecosystem. Demand and supply plans with automated planning, scenario modeling, and machine learning-guided problem resolution are some of the main benefits organizations leverage to increase agility and enable resiliency, driving better planning results, improved accuracy, and profitability.

Oracle's approach to provide all supply chain planning processes in a common platform and single data model helps increase planning efficiency, reduce decision latency, and bridge the gap between planning and supply chain execution.

Challenges

While Oracle continues to be a significant vendor in the cloud-native supply chain planning solution marketplace, it competes with an array of point solutions that solve specific planning needs. IDC expects Oracle to continue to be a major supply chain planning player. To continue to see strong growth numbers, the company must be mindful of the increasing number and variety of competitors.

Conclusion

The supply chain is now a key function for companies to realize their business aspirations. In a world where disruption is the next normal, a resilient supply chain that has visibility and agility will be critical, and Oracle Supply Chain Planning continues to innovate with both in mind. As companies think about the supply chain and the role that it plays in their business, they should consider the following:

- » Connect supply chain systems to all key enterprise systems, including manufacturing and ERP.
- » Look for capabilities that provide visibility across the supply chain to enable an agile response to both supply and demand fluctuations.
- » Invest in a modern, flexible supply chain suite.
- » Explore modern digital technologies. They are important ingredients to enable the visibility and agility necessary for true supply chain resiliency.

About the Analyst



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Simon Ellis is responsible for providing research, analysis, and guidance on key business and IT issues for manufacturers. Mr. Ellis has 30 years of experience in the manufacturing industry as both a market researcher and an end-user practitioner working across all major areas of the supply chain.

MESSAGE FROM THE SPONSOR

About Oracle

Oracle has been a leader in North America in the Supply Chain Management (SCM) market for the past seven years. Oracle's market share in 2021 was more than double the nearest competitor. Oracle Fusion Cloud Supply Chain Planning is purpose built for and with customers, leveraging next generation technology to evolve core planning functions for demand management, supply planning, sales and operations planning, and supply chain collaboration. Supporting a wide range of global customers across all industries, Oracle Supply Chain Planning offers resilient and agile solutions for any planning environment. Take some time to explore how Oracle is helping customers deliver better planning results, faster.

» [Explore Oracle Fusion Cloud Supply Chain Planning Products](#)



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