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RESILIENT SUPPLY CHAIN PLANNING FOR A DISRUPTIVE WORLD

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Introduction

The supply chain, whether manufacturer, retailer, or wholesaler, is a critical function for companies to realize their business aspirations. At IDC, we have noted that the supply chain has graduated from the role of "cost center" to one of "opportunity center." Companies with more resilient and capable supply chains will be able to avoid problems and seize opportunities better than their competition. Yet, in the age of COVID-19, supply chains are experiencing a bumpy ride. Some industry supply chains have seen significant disruptions but only minor demand changes, other industries have seen minimal supply disruptions but major demand changes, and still others have seen both. Regardless of the industry, supply chains are experiencing pressures unlike any we have seen in a generation.

AT A GLANCE

KEY STATS

63% of companies say that supply chain resilience is a critical gap in their supply chain.
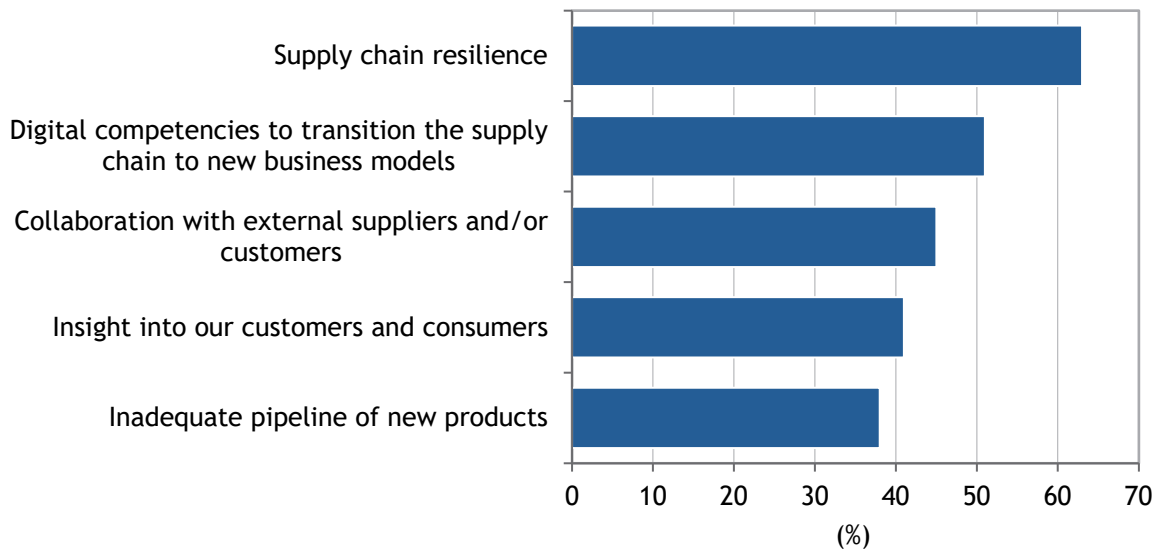
WHAT'S IMPORTANT

Visibility, agility, and resilience play a critical role in an increasingly disruptive world.

KEY TAKEAWAYS

Companies that invest in resilience, supply chain transformation, and supply chain planning _**software**_ will outperform those that do not.

Those who have both studied and operated supply chains for decades have always talked about the importance of visibility, agility, and resilience 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. 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 match supply with demand. When both supply and demand are highly volatile, supply chain planning with suppliers and customers is critical.

Although it is "easy" to see now that resilience is critical, even five years ago IDC was suggesting that resilience may well be the most important characteristic of the modern supply chain. Although COVID-19 is having a global impact in 2020, a multitude of other disruptions in recent years have also impacted the supply chain. Just in the last decade we have seen earthquakes, floods, extreme weather, and trade disputes having a major impact, and there is every reason to think that these kinds of disruptions will continue.

As a result, many of the companies IDC speaks with are prioritizing risk assessment and resilience much more highly than we have seen at any point in the past 20 years. Yet those same companies confess that it remains difficult 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 necessary 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.

FIGURE 1

Critical Areas for Improvement in the Supply Chain

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

N = 800

Source: IDC 2020 Supply Chain Survey

IDC is often asked what it is that will define the best-in-class supply chains of the future. Our answer is those companies that fully integrate and disperse supply chain planning across the enterprise and better utilize the massive breadth of data now available to the organization. More than ever before, the ability to leverage information across the extended enterprise will be a critical enabler of both the visibility and agility necessary to be resilient. Companies with disconnected supply chain planning capabilities will simply not be able to do this well. In an inherently disruptive world, the supply chain must be able to make the right strategic decisions with resilience. This means responsive planning processes that can sense changes and respond to them in real time. Indeed, planning is at the heart of a resilient supply chain and the glue that holds it together.

Supply and Demand Disruption

The impact on the supply chain has been partly a contributor to and partly a consequence of the economic downturn. The former has been mostly about supply disruptions, and the latter demand disruptions. Although most of the discussions about the supply chain have focused on supply disruptions (e.g., automotive parts factories closing in Wuhan or meat packing plants closing in the U.S. Midwest), demand disruptions are a greater worry — something IDC believes is not getting enough attention. If demand does not return, the restoration of supply will not matter. It is not that absolute of course, as some demand issues can be traced directly back to supply interruption. But much of the demand has been driven by the slowing of business activities. Consumer confidence can be a delicate thing; it might be too optimistic to thinks that consumers will flock back to their previous favored businesses.

Several senior supply chain executives we interviewed expressed frustrations with demand issues. They are challenged not just by the decline in demand across many different product categories, but also by their inability to forecast future demand given the range of market uncertainty. As one executive noted: "*We simply cannot accurately forecast demand right now. Even though our demand planning capabilities are quite advanced, forecasting still relies heavily on using the past to predict the future. A global pandemic has no prior precedence.*"

Whether supply or demand, the reality is that 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 passes with time and the resumption of normalcy. 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, or that the "carrying" the costs of flexibility or large inventories of things that degrade over time is impractical. But COVID-19 has exposed a material lack of visibility, flexibility, and adaptability that should be inherent to the industry. Referencing back to Figure 1, the reality is that for the foreseeable future companies that invest in resilience and digital competencies will outperform those that do not.

In the short term, supply chains should implement business continuity assessments to evaluate the recovery requirements of both supply and demand and 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. Modeling various scenarios in the short term and effectively planning for them requires the full power of an integrated supply chain planning platform with modern technologies — cloud, AI/ML, analytics, ecosystem networks, for example — 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.

In the longer term, to capitalize on the "next normal," IDC recommends revisiting, modernizing, and creating 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 with intelligent operational systems as part of flexible and dynamic workflows. Part of making the supply chain resilient is ensuring that the organization can manage across the four W's: 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 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 assessing maintenance issues with drones, moving inventory around warehouses with automated guided vehicles (AGV), or even using driverless vehicles for certain transportation routes, part of resilience is having ways to manage the operation of the supply chain through automation, should people be a limitation.

Indeed, in a disruptive world where the reliability of supply and the projection for demand has degraded, the importance of synchronized supply chain planning is critical. It is not enough to have

a best-in-class supply chain planning capability; it must be connected both upstream to design and supply and downstream to execution and delivery. Only then will the supply chain begin to be resilient.
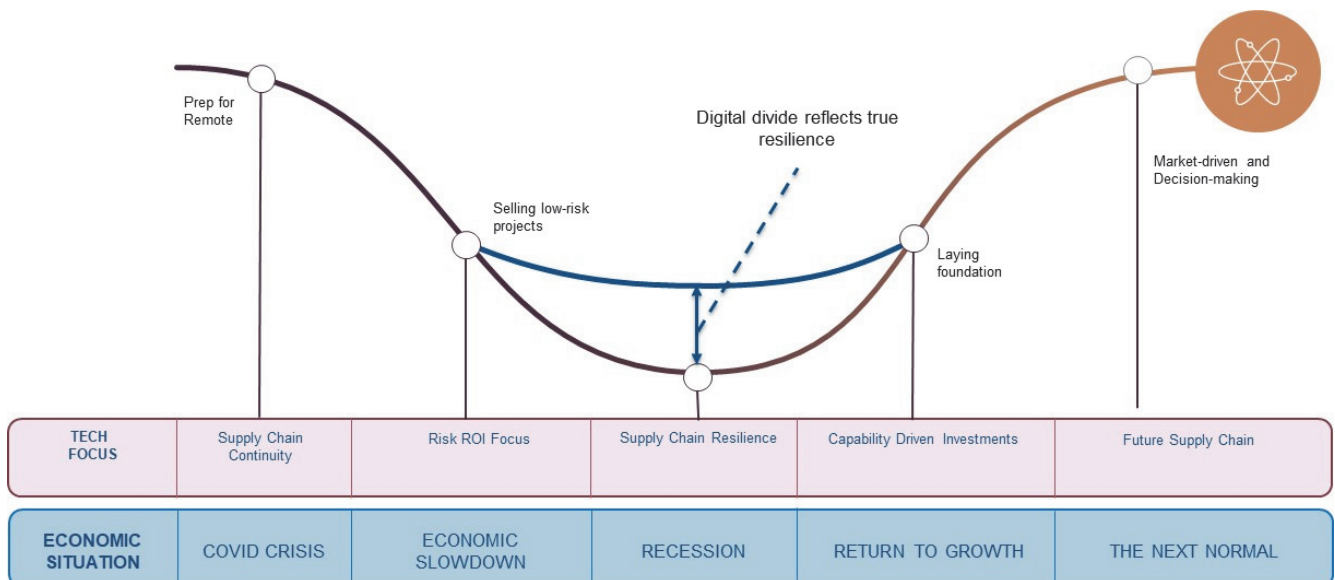
Supply Chain Resilience

At IDC, we are talking both with clients and within our research about the notion of supply chain resilience. 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. And it is not enough to be able to act, the supply chain must see where and how to act.

Companies that are more resilient tend to:

- Use cloud-based synchronized planning applications — less reliant on spreadsheets and directly connected to manufacturing and supply chain execution
- Be integrated across the breadth of the supply chain — from initial design/R&D, through supply management, to manufacturing and then both planning and execution
- Be collaborative across functions and organizations
- Leverage digital technologies such as AI and advanced analytics
- Have comprehensive visibility into both supply and demand
- Have predefined crisis-management resources

Nowhere is resilience more important than in the supply chain, and there are some interesting data points from the IDC 2020 supply chain survey that are worth exploring.

FIGURE 2
Supply Chain Resilience

| TECH FOCUS | Supply Chain Continuity | Risk ROI Focus | Supply Chain Resilience | Capability Driven Investments | Future Supply Chain |

| ECONOMIC SITUATION | COVID CRISIS | ECONOMIC SLOWDOWN | RECESSION | RETURN TO GROWTH | THE NEXT NORMAL |

Source: IDC 2020

The first point to make is that no level of technology or supply chain transformation can insulate the business from a collapse in demand. It can absolutely accelerate recovery, but it cannot magically create demand where none exists. This notion is illustrated in Figure 2. The economic

slowdown and recession are trends that have affected all companies to one degree or another. But the level of technology adoption within the supply chain and the ability to be resilient to market forces can mitigate the depth of the disruption, thus the notion of the digital divide in the graphic.

One of the questions we asked in the IDC supply chain survey was about the relative performance and level of transformation in the supply chains. Correlating the answer to this question with the impact of COVID-19 yields some interesting insight. Companies that viewed their supply chains as ahead of their peers were more likely to view the impact on their businesses as slightly less than those that judged their supply chains as either on-par or behind their peers.

TABLE 1

Correlating Supply Chain Resiliency with the Impact of COVID-19

	COVID-19 Major Impact	COVID-19 Minor Impact
Supply Chain Exceeds Peers	74%	26%
Supply Chain on a Par with Peers	85%	15%
Supply Chain Lags Peers	88%	12%

Source: IDC, 2020

Clearly major, particularly global disruptions will impact everybody, but there is some quantitative support for the contention in Table 1 that companies with more progressed supply chain resilience efforts are likely to fare better than their less progressed competition. Time will tell, certainly; but if prior economic recessions are any indicator, supply chain resilience and technology play well during and after a major market disruption

Benefits

In a recent research report, IDC did a survey 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 resilience tended to be characterized by siloed or highly reactive behaviors, the more mature by proactive or even predictive behaviors.

Mature supply chains were more likely to be looking 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. We saw a similar story when assessing the maturity of technology, with companies that have prioritized resilience in their technology investments 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 prioritize full integration between internal applications and significant integration with both up and downstream trade partners to ensure applications were purpose designed to address and support risk and resilience.

Fast forward to 2020, and these things are more important than ever. If organizations cannot see what is happening and respond quickly, they will not be resilient. Companies that had embraced supply chain resilience using an integrated and synchronized supply chain planning facility and multi-enterprise networks with up and downstream collaboration indicate a broad range of benefits. The ability for the supply chain to support business requirements from initial product design through to post sale support requires a number or capabilities, including speed, agility, collaboration, and resilience. 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 network-driven 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:

- Superior financial performance. IDC estimates that coupling analytics and holistic planning to extract broader financial insights will be worth 3%–5% of incremental revenue as well as a 2%–3% margin for industry leaders.
- More effective innovation delivery. IDC estimates that holistic digital planning enables a 10% systemic reduction for 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%.

SAP Technology Profile

SAP can help your company to thrive by anticipating and preparing for disruptions with digital business planning software that helps to plan with visibility across silos to achieve higher supply chain resilience.

To be more responsive and reduce the time of planning cycles, organizations need to connect across departmental silos for a unified view of real-time supply and demand that helps balance inventory and service levels. To speed planning cycles and react faster to change, planners want synchronized planning processes that break down silos and tools to quickly run simulations for better decision making. Listed below are some specific capabilities of SAP Integrated Business Planning:

- **Demand-driven predictive and prescriptive modeling**: Customer experience and demand sensing incorporated in predictive modeling for higher service levels, overall responsiveness and forecast accuracy.
- **Continuous alignment from strategy through execution**: Synchronized planning processes with process control on strategic, tactical, and operational levels across the organization and trading partners with advanced analytics and simulation.
- **Real-time visibility on the extended supply chain**: Visibility into the extended supply chain from source, make, deliver, and operate to timely understand impact and execute adjustments.

SAP Supply Chain Control Tower is the visibility layer to SAP IBP. It connects various supply chain relevant sources to provide end to end visibility across the network. The solution provides

insights into the current performance of the supply chain as well as projections into the future. Seizing sophisticated alert functionality, enables management by exception so that planners can quickly react to any issues and supports collaborative problem resolving.

SAP is can help companies achieve a much higher degree of business performance by digitally linking strategic and operational supply chain planning with real-time visibility, response, and execution. The embedded optimization of resources and inventories across the supply chain not only decreases working capital but also enables a much more sustainable operation. SAP IBP for Supply Chain is infused with self-learning technologies that shorten decision-making time and enable a more touchless supply chain, which is the foundation to the intelligent enterprise.

In summary, SAP solutions for digital business planning enables companies to:

- Garner real-time insights and visibility from the intelligent enterprise
- Support the entire value chain with integrated and synchronized business processes
- Collaborate on decisions to ensure all parties are involved in driving the business
- Simulate business decisions to simulate downstream impacts of opportunities or risks to your business
- Leverage a flexible data model and role-based user experience that supports the changing roles in your business.

Solution in a Box:

SAP Integrated Business Planning is a single platform that provides the following capabilities:

Control Tower & Intelligent SC Visibility
Detect, Analyze and Act with intelligent exception management across the extended supply chain including manufacturers and suppliers to predict and mitigate bottlenecks. Apply Machine Learning to manage exceptions and analytics to navigate from alerts to contextual planning views.

Demand Planning & Forecasting
Better predict customer needs and market dynamics by leveraging statistical and machine learning algorithms. Using best practice best-fit statistical models, outlier correction, and time-series analysis to provide for more automated, touchless demand planning across different hierarchies.

Sales & Operations Planning
Effectively balance demand and supply, attain financial targets, and enable cross-functional process orchestration and collaboration. Leverage process management to align different stakeholders in the organization that have a different perspective or view on the plan but act as one cohesive aligned organization.

Demand-Driven MRP (DDMRP)
Dynamic planning of replenishments with demand-driven MRP (DDMRP) that is fully integrated into an existing MRP concept. Replenishment only for real demand and introduction of buffers at strategically important points.

Inventory Optimization

Coordinate inventory target setting using multi-echelon (multi-stage) inventory optimization to buffer uncertainties such as imperfect forecasts, demand variability, and the risks of late deliveries. Improved service levels using the least amount of inventory and gaining insights visualizing the supply chain network and drivers of inventory.

Response & Supply Planning

Create a feasible and optimized supply plan respecting capacity and material constraints/ characteristics to respond to changes. Leverage purpose-built solvers using optimization, constrained heuristics and pegging to understand the relationship of supply plans relative to financial and service level goals.

Planning Automation and Embedded ML

Improved material planning with faster, more frequent material requirements planning (MRP) runs, multiple times a day, with planning and rapid replanning in minutes instead of hours to minimize inventory. One single harmonized MRP process for all materials, both unconstrained and those requiring advanced constraint-based planning.

What-if and Scenario Planning

What-if and scenario planning to react to market demand through the best service at lowest cost. SAP S/4HANA in conjunction with the SAP Integrated Business Planning application for sales and operations enables integrated, continuous, and iterative supply chain planning.

Challenges

Supply chain management, and planning specifically, is a crowded space with offerings from vendors both big and small. SAP has been in the supply chain planning space for a long time, with a significant installed base of older tools like APO. Although SAP currently offers a best-in-class IBP platform, APO is often the "target" to be replaced with niche solutions. It is critical that SAP continues to promote the benefits of connected planning and the benefits that will accrue from synchronizing planning both upstream and downstream in the extended supply chain.

Conclusion

As stated at the beginning of this paper, the supply chain, whether manufacturer, retailer, wholesaler, or something else, is now a critical function for companies to realize their business aspirations. In a world where disruption is the "next normal," a synchronized supply chain planning capability that spans the full breadth of the supply chain is of enormous help. Indeed, the role of synchronized supply chain planning, is a central one to achieving the necessary levels of overall supply chain resilience. As companies think about the supply chain, and the role that it plays in the business, consider the following:

- What will a synchronized supply chain mean for your business? Is it important? If so, why? What role must supply chain planning play for your business?
- Do not plan in silos. Make sure that your supply chain is fully connected from design/R&D through to customer fulfillment and execution.
- Connect supply chain systems to all key enterprise systems, including manufacturing and ERP.
- Look for capabilities that provide visibility in planning and enables an agile response to both supply and demand fluctuations.
- Invest in a modern, flexible planning suite and dispense with spreadsheets once and for all.
- Explore modern digital technologies. They are necessary ingredients to enable the visibility and agility necessary for true supply chain resiliency.

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About the Analysts

Simon Ellis, Program VP, Manufacturing Insights

Simon Ellis is responsible for providing research, analysis, and guidance on key business and IT issues for manufacturers. With 30 years of experience in the manufacturing industry, both as a market researcher and end-user practitioner working across all major areas of the supply chain, Mr. Ellis was previously the Supply Chain Strategy Director/Futurist for Unilever North America, a $12 billion division of Unilever.

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