Supply Chain Insights™

NAVIGATING THE SUPPLY CHAIN THROUGH THE PANDEMIC

An Opportunity to Build Better

February 2021

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TABLE OF CONTENTS

Open Content Research

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Research Methodology

This report reports findings from a survey fielded in 2020. We sourced respondents from personal LinkedIn connections, direct mail campaigns using contacts from the Supply Chain Insights and Kinaxis databases

Disclosure

Your trust is important to us. In our business, we are open and transparent. We never share respondents' names or give attribution to the open comments collected in the research.

Summary

First defined in 1982, supply chain management improves business outcomes through the orchestration of make, source, and deliver processes together. The practices are nearing the end of three decades of maturity. As the supply chain evolved, it became more global and complexity increased. The move to a global supply chain increases both opportunity and risk. Managing the supply chain in the pandemic exposed both.

The Covid-19 pandemic tested the concept of the global supply chain. While prior risk management disruptions happened and then established a new normal, in the COVID-19 pandemic, the only normal is constant change. Leaders experienced unprecedented demand and supply variability riding the waves of disruption after disruption.

We designed this research report to document the pandemic's impact, now in its second year, on the global supply chain. To derive insights, we conducted a series of semi-structured qualitative interviews with twenty supply chain leaders. Based on the interviews' insights, we then designed and fielded a quantitative study based on business leaders' feedback. One hundred and eighteen respondents completed the survey. In this study, we answer four basic questions:

1. **Did innovative companies perform better during the pandemic?** *Yes, mid-way through the pandemic in September-October 2020, companies rating themselves more innovative rated themselves significantly better on agility and responsiveness at an 80% confidence level.*

2. **Were companies that were better at planning perform better during the pandemic?** *The answer is yes. If the company had mature capabilities in order-promising processes, production scheduling, and Sales and Operations (S&OP) planning, they rated themselves significantly more agile.*

3. **Did the choice of planning systems matter?** *The answer is yes. Companies using best-of-breed solutions successfully executed S&OP plans more successfully than manufacturers using the SAP platform (ERP plus APO or IBP).*

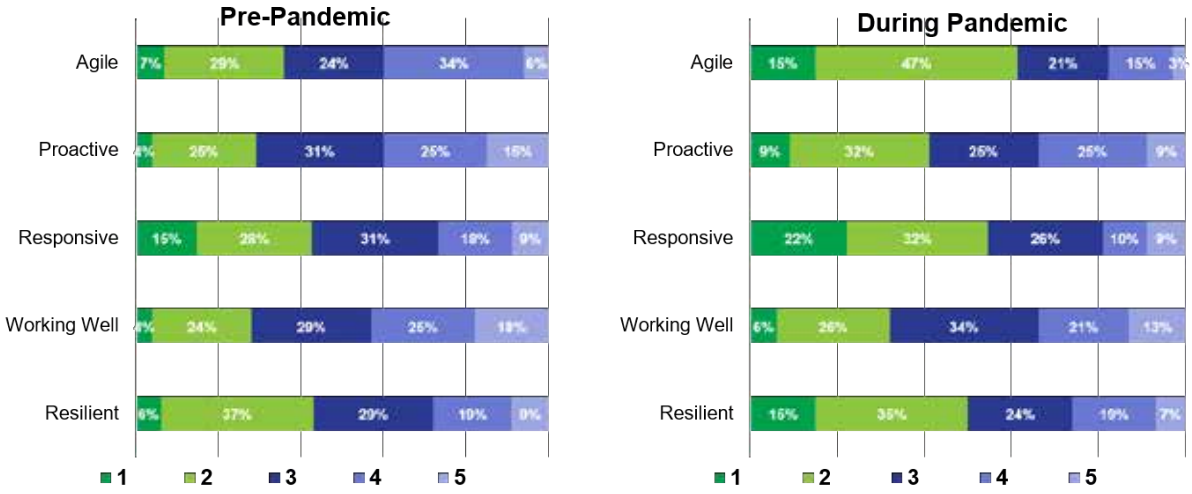
4. **What can we learn from the pandemic response to share more widely with supply chain leaders?** *During the pandemic, in 75% of manufacturing organizations, collaboration across functions and roles improved in ways that were not possible before. The power of this organizational dynamic will change supply chains for the long-term. The pandemic response drove unprecedented collaboration within companies. Solving the problems enabled the teaching of supply chain management basics to executives in ways that were not possible pre-pandemic. The call to action aligned the organization and closed the gaps between functions to ensure business continuity. The question is will this redefine work post-pandemic?*

The handprint of the pandemic will redefine supply chain processes. The lessons learned offer promise that the lessons learned will drive long-term improvement. The question is how to build better based on the lessons learned.

Assessing Pandemic Performance

During the pandemic, supply chain organizations rated themselves significantly lower on a five-point scale (1=lowest, 5= highest) for five factors of supply chain performance (agility, proactivity, responsiveness, working well, and resilience) measured in this research, as shown in Figure 1. Traditional supply chain processes were not equal to the test. For most organizations, this is a wake-up call.

Figure 1. Pre-Pandemic and Pandemic Performance Levels

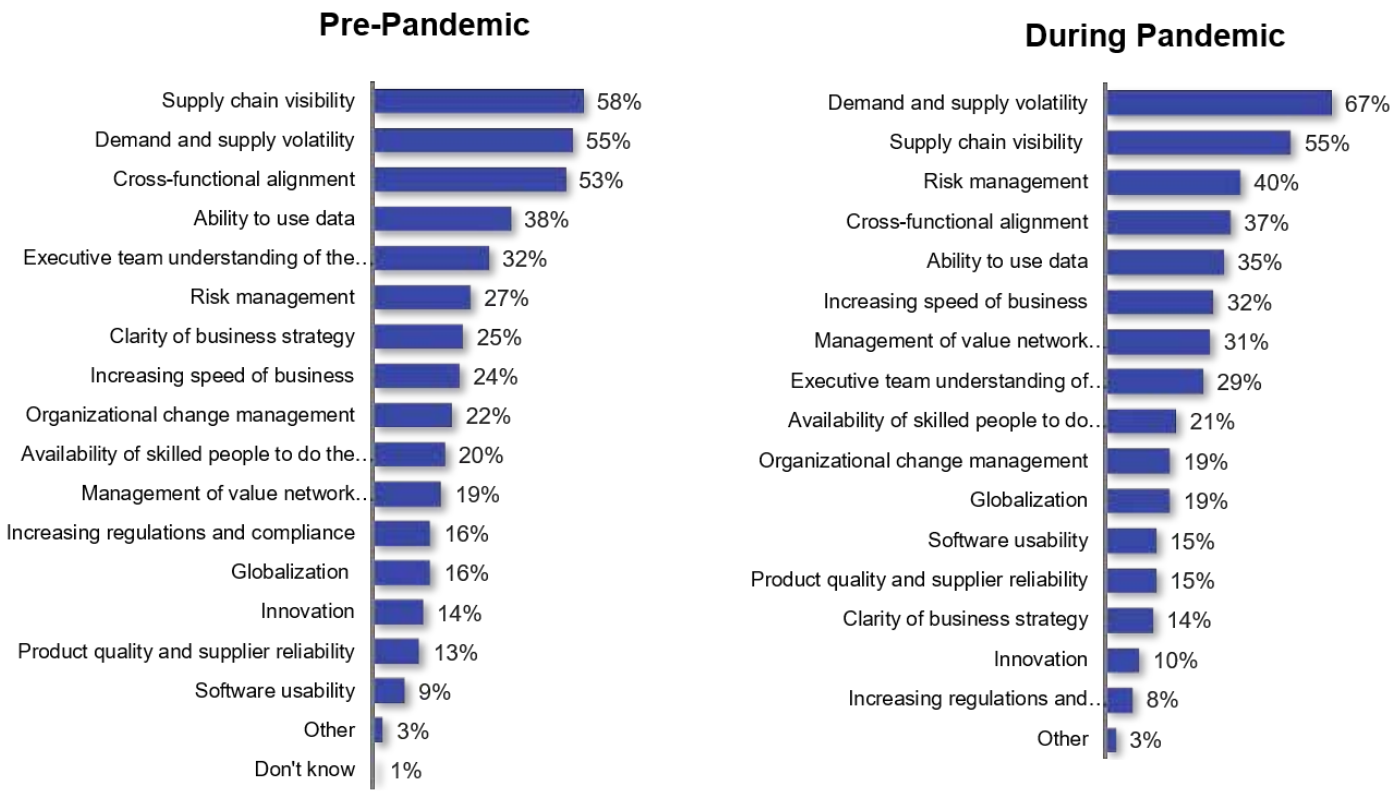


Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Respondents – (N=118)
Q8. Which set of descriptors best describes your supply chain / your typical client's supply chain (for technologist/ consultant) as you work through disruption?

In research, definitions matter. For this research, we defined agile as the ability of the organization to have the same cost, quality and customer service given the shifts in demand and supply variability. The definition of proactive is the ability to sense and drive an organizational response preemptively before an occurrence. In contrast, a responsive supply chain has short cycles while a resilient organization delivers consistent balance sheet results despite business conditions. These are complimentary, but different attributes. Each attribute is a stark contrast to the efficient supply chain which focuses on the delivery of the lowest cost/unit with minimal waste.

The business issues shifted during the pandemic. As shown in Figure 2, before the pandemic, the largest business problem was supply chain visibility. During the pandemic, the management of demand and supply surpassed visibility. Risk management also grew in importance.

Figure 2. Areas of Significant Business Pain Before and During the Pandemic for the Supply Chain Leader



Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Respondents – (N=118)
Q22. When it comes to doing your job during the pandemic, which of the following are your top 5 elements of business pain?

While companies speak of breaking down functional barriers, companies naturally aligned against a common purpose to fulfill orders during the pandemic's uncertain times.

Voice of the Supply Chain Leader

As a part of this research, twenty manufacturing supply chain leaders from different companies participated in two qualitative interviews. Here we share snippets, or quotes, from the interviews to better help the reader understand the implications of the quantitative research.

Tell us what happened? Insights on Demand

- Demand was an elevator with either a sharp upturn or a quick drop to the basement. For example, the local automotive business collapsed, but food products' demand exploded. *(Chemical Manufacturer)*
- There was a sharp increase in sales with severe supply constraints. *(Consumer Electronics Manufacturer)*
- We experienced a strong auto market in China and a downturn in North America. *(Polymer Manufacturer)*
- We were insular to market demand resulting in the inability to ramp-up production and adequately supply the market. *(Resin Producer)*
- Demand patterns were markedly different in each continent and country. *(Household Products Manufacturer)*
- The shifts were worse than expected. I was surprised how disconnected the patterns and changes were at a country level during the pandemic. *(Food Manufacturer)*
- Demand was very erratic from March through July 2020, but leveled-out in July. *(Food Manufacturer)*
- Demand is unpredictable. The good news is that people are buying our stuff and more of it. The problem is that it is difficult to predict and struggled with service. *(Food Manufacturer)*

The takeaway: The largest issue for supply chain leaders in the pandemic was demand variability. The shifts in the signal were both radical and swift. While traditional demand processes use insights from history as a guide for the future, this changed during the pandemic. Harvesting historic insights became less relevant. To survive, businesses abandoned their demand planning applications and built plans through brute force using custom applications.

What happened? Insights on Supply

- We placed greater emphasis on the health of our associates. The biggest challenge was getting Personal Protective Equipment (PPE) and hand sanitizer to ensure workforce safety. *(Household Products Manufacturer)*
- We came together by meeting every morning at 8 AM and quickly moved from a monthly S&OP to a weekly S&OP execution cycle. *(Automotive Part Manufacturer)*
- The team established capacity allocation meetings on Saturday and Sunday. *(Food Manufacturer)*
- We experienced ongoing material supply issues. We dived through the first wave and took measures on the portfolio and keeping the finished goods inventory at 80-90% with an optimized assortment. *(High-Tech and Electronics Manufacturer)*
- Our team created a virtual daily war room with daily meetings. *(Food Manufacturing)*
- We struggled when there was no more belly capacity in aircraft. As a result, we chartered planes and worked through multiple air flights rescheduling. Getting into Canada was tough. *(Agrosciencies Manufacturer)*
- The most significant impact is raw material sourcing. Before the pandemic, we started to diversify for low volume and unique items. Not just different vendors but diversify against geopolitical issues. For example, we thought we had diversified, but we found that all three suppliers for the same material depended on the same source in China. The pandemic exposed risk issues that we did not know that we had. *(Food Manufacturer)*
- Our prior work on the disaster recovery plan was beneficial. For example, the shift for the call center to do work from home during inclement weather paid big dividends. *(Household Products Manufacturer)*
- Internal collaboration is now better across the supply chain. We are all impacted, resulting in people working together better. Our service is down, and supplier shortages are common, but there is more understanding and less figure pointing. *(Apparel Manufacturing)*

The Takeaway: Supply issues, while severe, were more manageable than demand variability. Each industry experienced different issues at a high level, but companies overcame their problems through improved collaboration. All business leaders expressed the need for greater flexibility in what-if modeling.

What did you learn Overall?

- Take care of your people. For the first 6-8 weeks, the work from home was not beautiful. We had to get busy quickly to create the work at home environment. *(Automotive Manufacturer)*
- I learned diversity helps with resiliency. Getting people together virtually across the world regularly enabled us to resolve our issues. *(Agroscience Manufacturer)*
- We have been investing in digital. The crisis has increased the penetration of digital tools. *(Discrete Manufacturer)*
- We focused on alignment with external manufacturers. We accelerated payments. *(Pharmaceutical Manufacturing)*
- Meetings were more efficient. We used to have meetings where people were in the room, and there were remote attendees. This meeting format did not work very well. Covid-19 leveled playing field and improved the meeting dialogue. *(Chemical Manufacturing)*
- The effectiveness of remote meetings opened my eyes. What will we do with the office space? *(Household Products Manufacturer)*
- We opened a learning center, and now it is a classroom for employee's children that are up to the age of 12 for virtual classes. The company is providing tutoring at no additional cost to the employee. *(Chemical Manufacturer)*
- We struggled with ongoing VISA issues. At first, we were chartering planes to Korea and Japan. We found it impossible to get the right skill set to China to keep production running. *(Discrete Manufacturing)*

The Takeaway: Global organizations redefined work to be virtual and it was surprisingly effective. In fact, and surprisingly, for many the virtual environment was more effective to support in managing a global team.

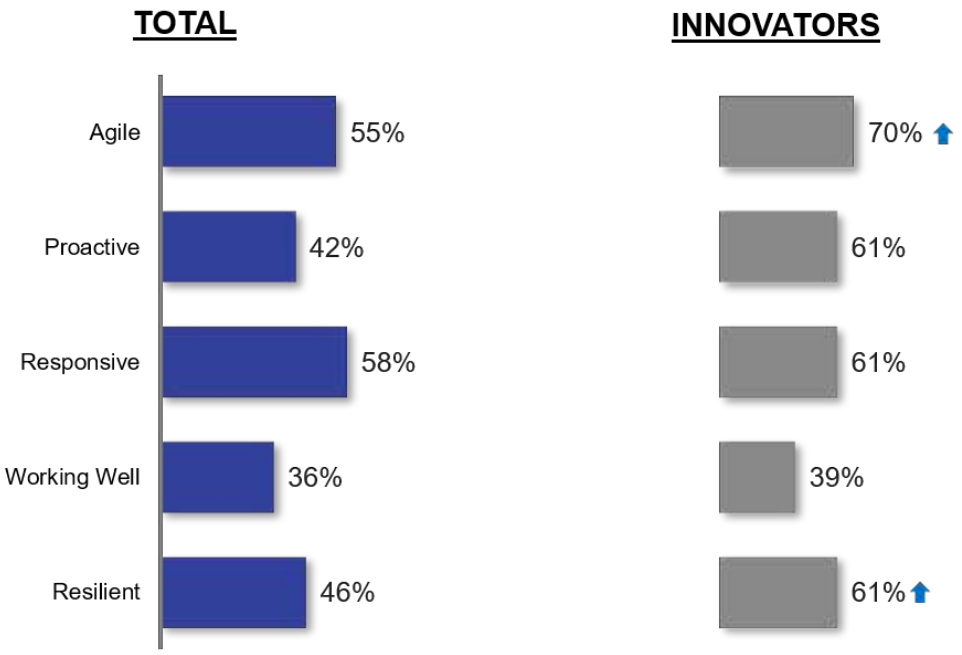
Driving Agility

During the pandemic, both demand and supply variation increased at an unprecedented level. The larger the organization and the more complex, the more significant the pandemic's impact on agility.

North American manufacturers rate themselves less agile in the research than their European counterparts. A Company focused on IT standardization struggled to adapt to the unprecedented demand and supply changes in the pandemic.

As shown in Figure 3, companies rated themselves more agile in the pandemic if they were an innovator in analytics, were more balanced in managing S&OP processes, and had more mature production scheduling capabilities and order promising capabilities. Shown in Figure 3 is the data from the innovator cross-tab analysis.

Figure 3. Cross Tab Results of Performance Ratings by Innovation Maturity

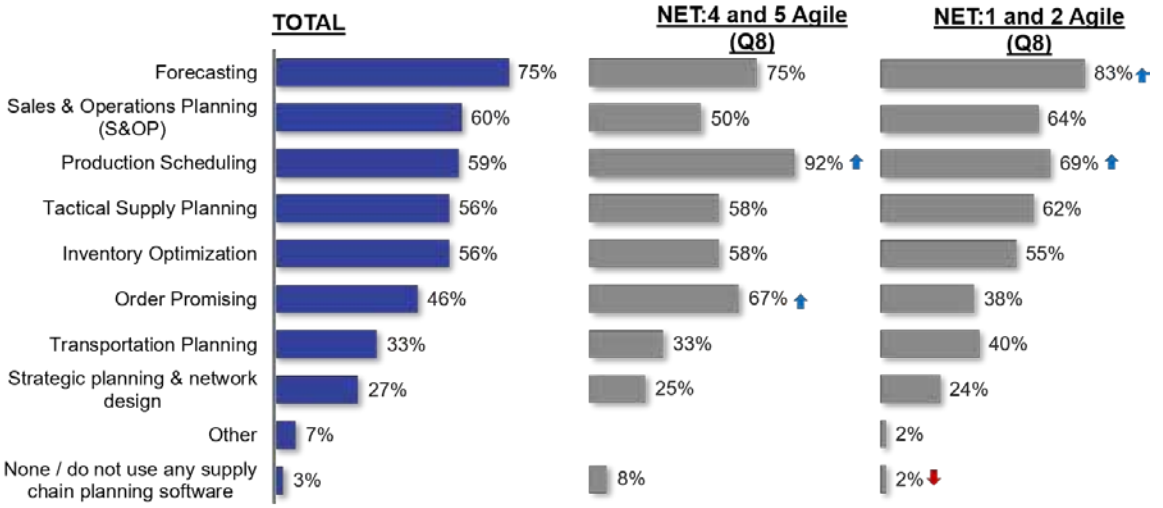


Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Respondents – (N=118)
Q8. Which set of descriptors best describes your supply chain as you work through disruption?
Q2. In your opinion, pre-pandemic, which of the following best describes your company's approach to investing in innovations and/or new technologies?

↑ Significantly Higher than TOTAL at 80% Confidence Level
↓ Significantly Lower than TOTAL at 80% Confidence Level

As shown in Figure 4, the organizations' maturity in planning software mattered during the pandemic. When the company had a mature S&OP process, coupled with production planning and order promising, the business leaders rated the organization higher on agility during the pandemic.

Figure 4. Relationship Between Software Deployed and Levels of Agility
(Ratings of levels 4 and 5 are mature while 1 and 2 are not mature.)



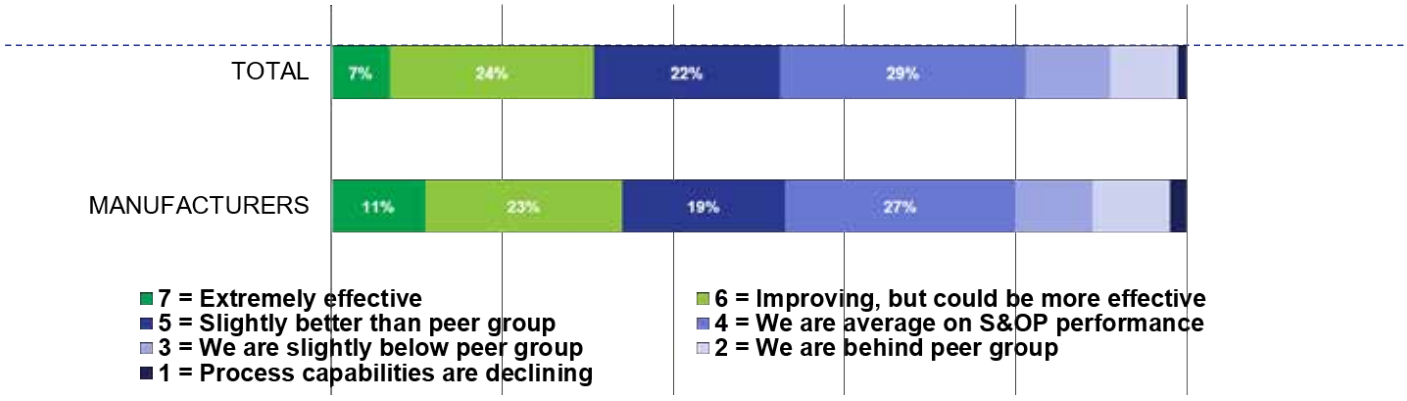
Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Respondents – (N=118)
Q24/Q8: Which of the following types of supply chain planning software, if any, does your company use?

↑ Significantly Higher than TOTAL at 80% Confidence Level
↓ Significantly Lower than TOTAL at 80% Confidence Level

The Role of Sales and Operations Planning

The more mature the S&OP process, the more agile, proactive, and resilient the organization. As shown in Figure 5, 1/3 of manufacturing companies are mature in S&OP, with 41% of companies balanced between the "*S*" and the "*OP*" in S&OP.

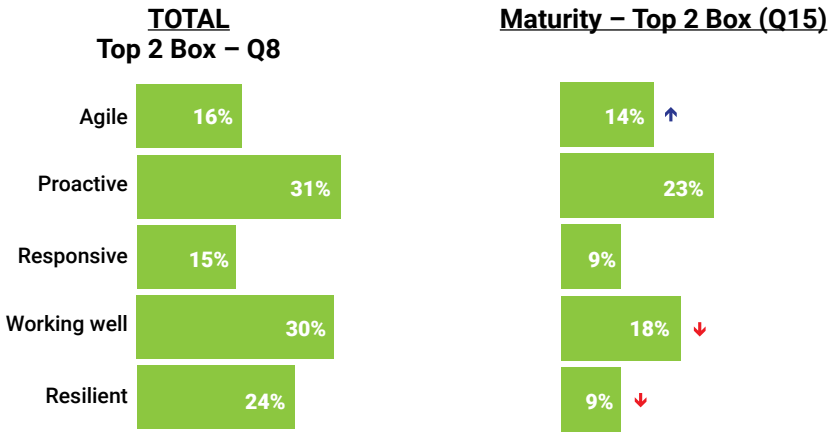
Figure 5. Sales and Operations Planning Maturity



Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Q15: On a scale of 1-7, how effective do you feel that your current organization (for business users) / typical client (for Vendor or consultant) is on S&OP processes?

Figure 6 shows the cross tab results on descriptors to S&OP maturity. The most mature companies on agility were also the most mature on S&OP.

Figure 6. Relationship Between S&OP Maturity to Agility



Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Answering – (N=106)
Q15/Q8: On a scale of 1-8, how effective do you feel that your current organization is on S&OP processes? Q8: Which set of descriptors best describes your supply chain

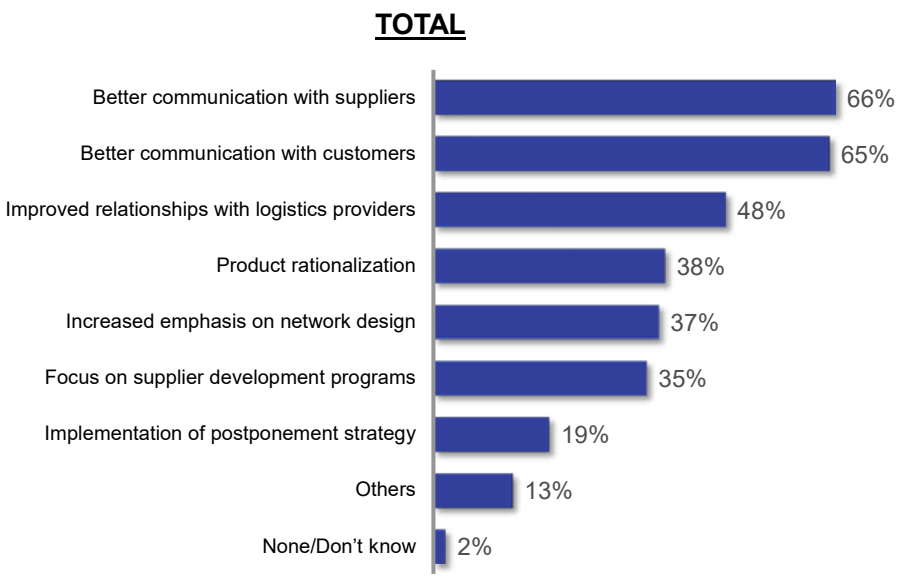
↑ Significantly Higher than TOTAL at 80% Confidence Level
↓ Significantly Lower than TOTAL at 80% Confidence Level

Improvement of Collaboration Within the Company

During the pandemic, 75% of manufacturing environments became more collaborative. As shown in Figure 7, the focus took many forms focused on improved communication, trading party policies, and a redefinition in internal processes. The improved ways of working are a springboard for process improvement post-pandemic.

In interviews with supply chain leaders, we heard comments like, "We all laid-down our cards and worked together to fulfill orders. Our functional barriers disappeared as we became more human trying to make the best out of a difficult situation." Virtual work processes, and the work at home environment, equalized team participation and drove experimentation with virtual collaboration technologies. In the post-pandemic work environment, teams are rethinking travel, the format of meetings, and the need for physical office space.

Figure 7. The Focus of Collaborative Efforts

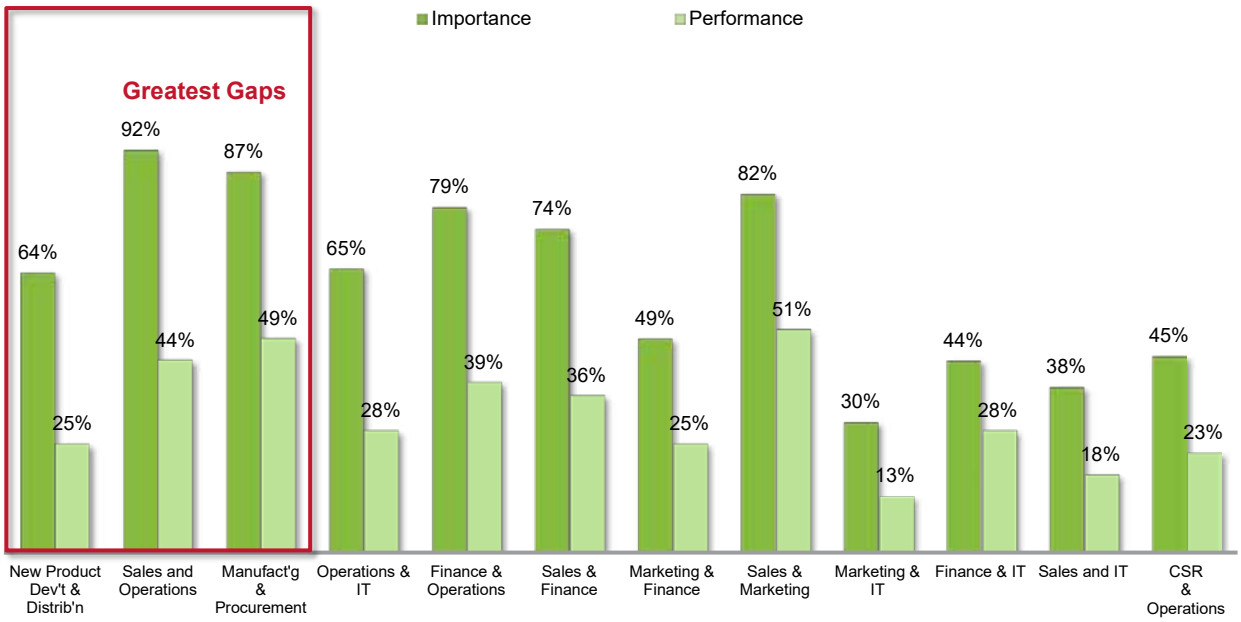


Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=110)
Q13: Due to the increased internal collaboration, what opportunities did the organization experience?

A significant driver of the collaborative efforts was improved organizational alignment. Figure 8 shows the alignment pre-pandemic, while Figure 9 contrasts the alignment during the pandemic. Note that the closure of the gap between importance and performance is indicative of better alignment between commercial and operation teams during the pandemic

Figure 8. Organizational Alignment Pre-Pandemic

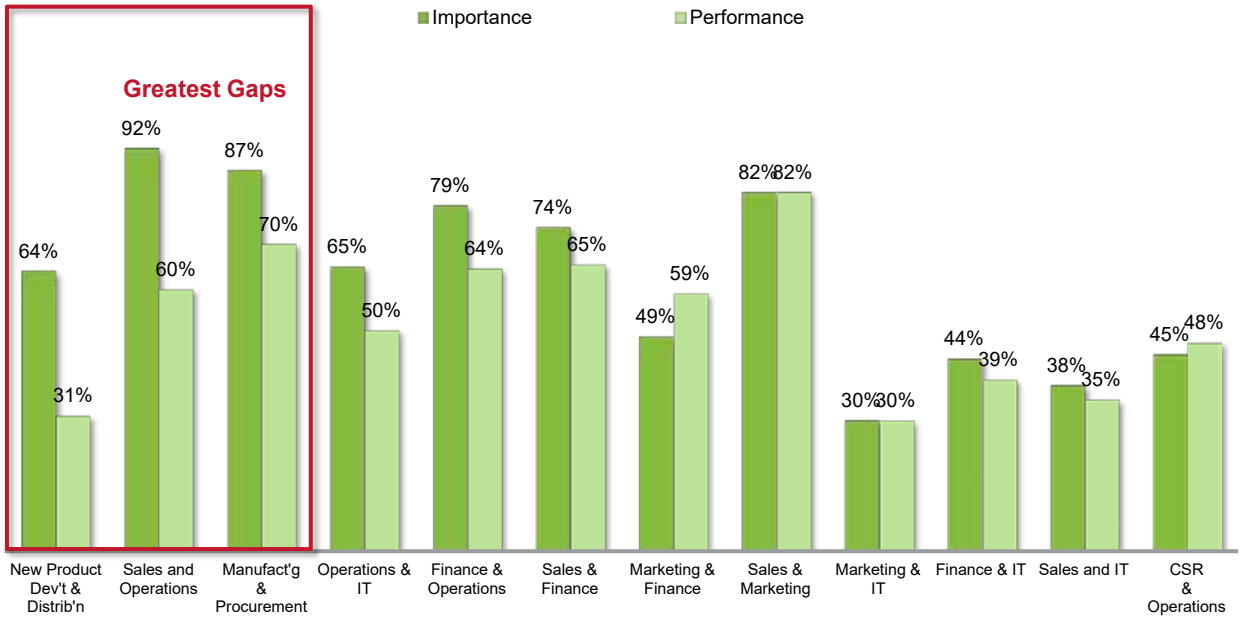
Team Alignment: Importance vs. Performance*



Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Answering – (N=118)
Q9. In your opinion, how important is it for each of the following pairs of teams to be aligned?
Q10. How aligned do you believe that these same pairs of teams were at your company prior to the pandemic?

Figure 9. Organizational Alignment During the Pandemic

Team Alignment: Importance vs. Performance*



Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Answering – (N=118)
Q9. In your opinion, how important is it for each of the following pairs of teams to be aligned?
Q11. How aligned do you believe that these same pairs of teams were at your company during the pandemic?

As the gaps between operations and commercial teams closed and manufacturing and procurement worked better together, many organizations commented on new effectiveness levels. Also, the gaps between operations and IT, which widened significantly in the last decade, narrowed during the pandemic as companies tried to maximize the value of current systems.

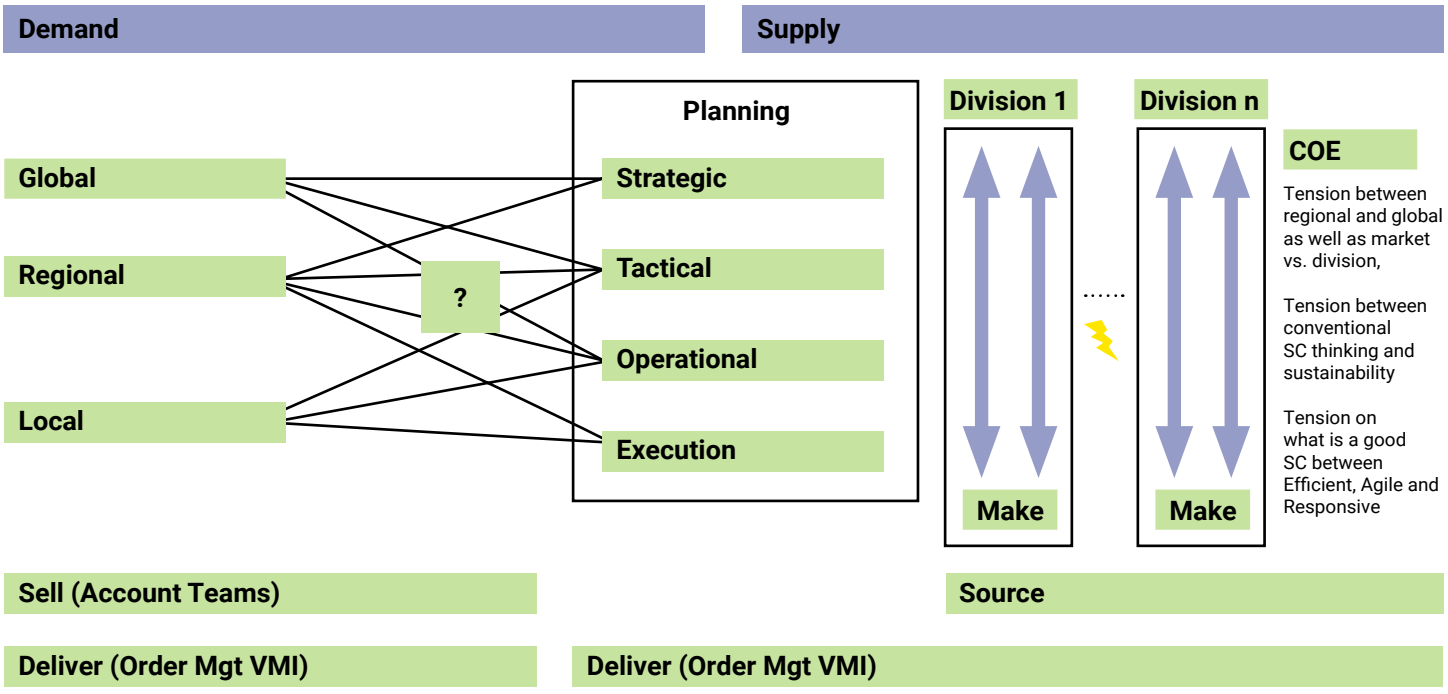
Driving value from supply chain planning solutions requires alignment and governance. Using technology to improve decisions assumes that organizational alignment in making a decision and agreement on what constitutes the right decision. Both are issues in everyday business environments, but the pandemic's impetus of business continuity closed the gaps.

As companies contemplate the future, the lessons learned through the pandemic are useful to define future governance—the role of finance, input from divisions and regional organizations, and the differences between sales input and market data-- in the use of planning systems. The more fractured the organizational design across make, source, and deliver, the greater the need to answer these critical questions.

Few companies clearly define supply chain excellence, relying on functional metrics that divide, not unite, the divisions and functions. Over the last decade, the focus was on installing decision support technologies, not necessarily using the systems to drive value. The human system's design and how people should work are opportunities for all.

Governance and organizational alignment are an opportunity for 95% of organizations. The pandemic offers companies powerful lessons. To sensitize the reader to these issues, Figure 10 represents the myriad of options for a large manufacturer.

Figure 10. Organizational Tensions in Organizations Attempting to Define Supply Chain Planning Governance



Technology

While over 60% of companies report satisfaction with their planning solutions, no company in the qualitative research used conventional planning technologies to manage demand volatility. The reason? Planning solutions are hard-wired into current IT architectures and not widely available to operational teams. (Typically, a small group within a company uses planning technologies. Based on our experience with manufacturers, this represents 1-2% of a back-office team.) As a result, under duress, organizations turned to descriptive analytics to improve decision-making in a critical time.

The respondents identified demand visibility as an enormous functionality hole in a series of open-ended survey questions on supply chain planning gaps. The answers to the question of "*What functionality was not available to you that you needed during the pandemic*" are shown in a word cloud in Figure 11. The size of the word represents the magnitude of the gap.

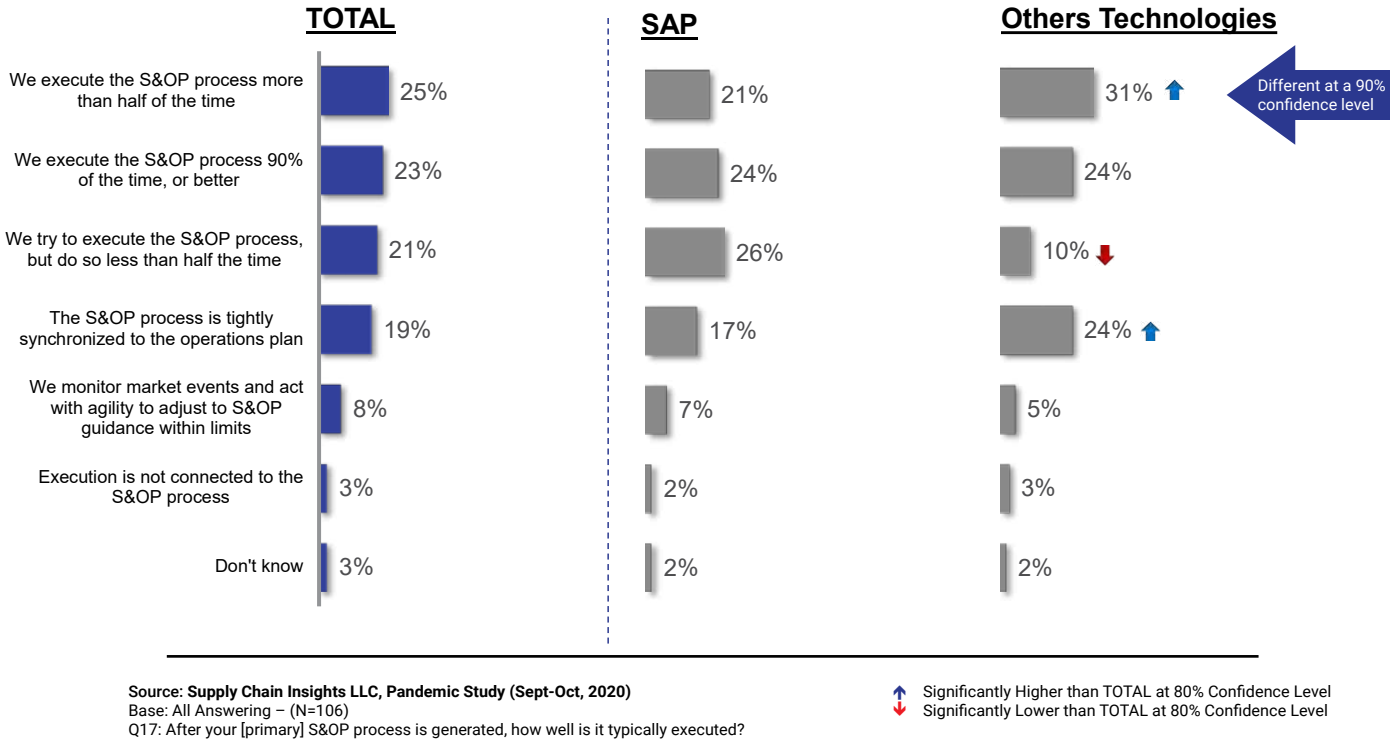
Traditional planning approaches are supply-centric: a focus on improving manufacturing, distribution, or transportation. Demand planning is less mature than supply planning. The pandemic shattered the assumption that historical data—orders and shipments—is sufficient input to model future demand. During the pandemic, most qualitative interview participants turned their demand planning solutions off building one-off capabilities to harness market data—point of sale, event data, internet of things signals, and other market drivers-- to predict demand better.

Figure 11. Word Cloud of Open-ended Responses on Planning Solutions During the Pandemic

No company is clear on the next step to close the demand planning gap.

In addition, companies tightly tethered to integrated solutions struggled to adapt. For example, companies using SAP ERP plus a planning tool like SAP APO or SAP IBP rated themselves significantly less agile. An example is the inability to use the tightly linked planning systems to ERP for ad hoc scenario analysis.

Figure 12. Comparison of Use of Best of Breed Technology Usage to SAP Standardized Architectures During the Pandemic

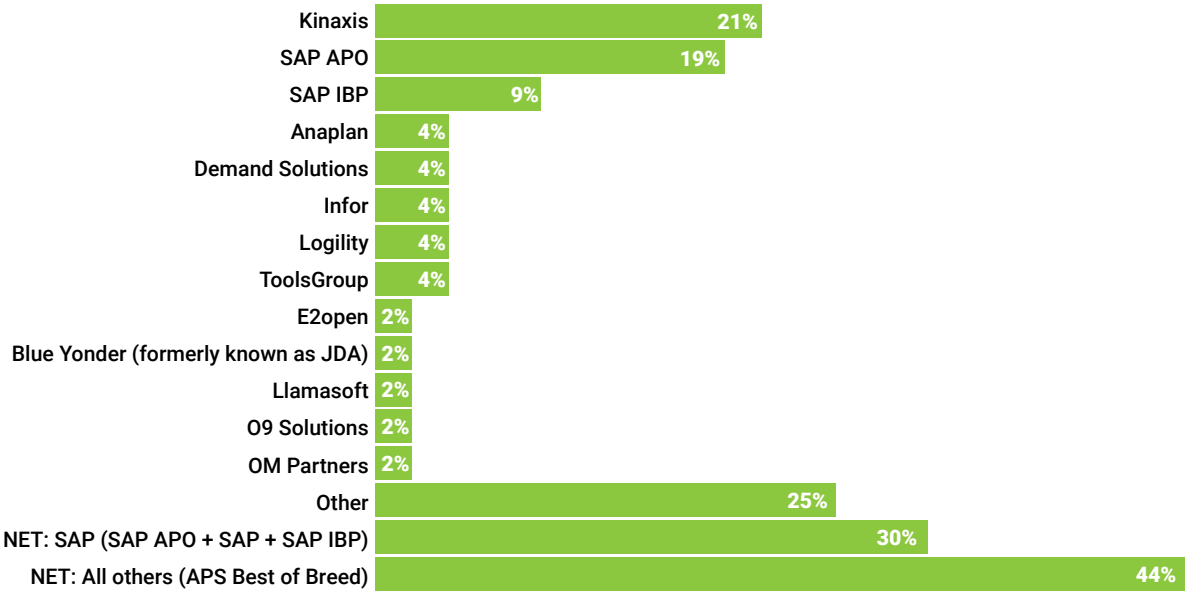


Source: Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)
Base: All Answering – (N=106)
Q17: After your [primary] S&OP process is generated, how well is it typically executed?

↑ Significantly Higher than TOTAL at 80% Confidence Level
↓ Significantly Lower than TOTAL at 80% Confidence Level

When asked the question, "What was the most important tool to help resolve problems?", Kinaxis, a more flexible and easier-to-use planning tool, tops the list. In aggregate, best-of-breed planning solutions were used to a greater extent than the planning solutions from Enterprise Resource Planning (ERP) providers to solve supply chain problems during the pandemic.

Figure 13. Most Used Solutions to Solve Problems During the Pandemic



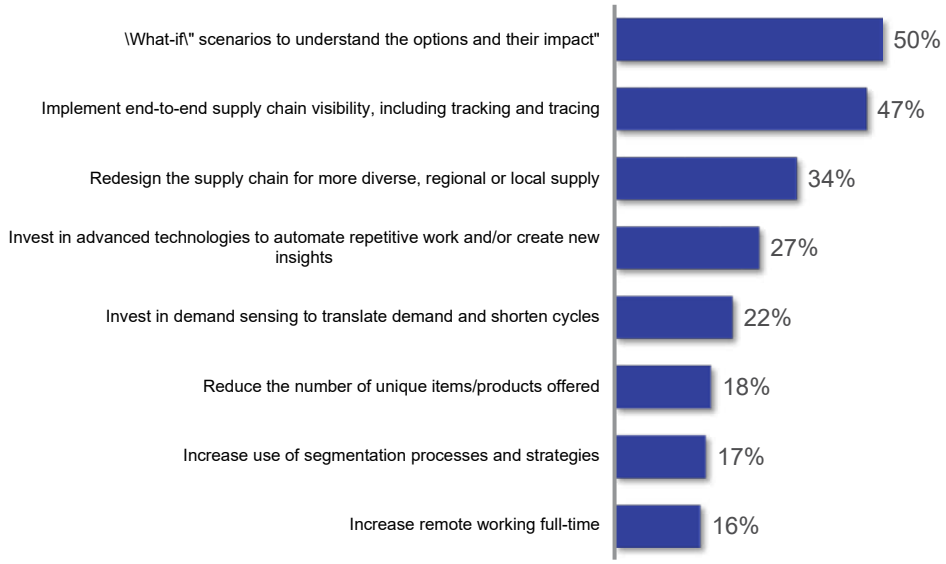
Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=57)
Q26: During the PANDEMIC which was the most important technology in helping to resolve problems?

Over the last two decades, organizations focused on technology implementation. The pandemic proved that technology, for technology's sake, is not sufficient. The Covid-19 response offers business leaders an opportunity to rethink human and organizational systems and use technology innovation to drive improved value.

Recommendations

As organizations step back and reflect on lessons learned from the pandemic, there is no right best next step. As shown in the respondent's answer to "*What steps are you taking to prepare for future disruptions?*" the investment in what-if ad hoc analysis is at the top of the business leaders list. In Figure 14, we share the most common responses.

Figure 14. Next Steps for Organizations



Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q19: As you think about preparing for upcoming other future disruptions, what steps will you take to prepare?

Post-pandemic, when the dust settles, there will be multiple initiatives to consider. From this research, several are readily apparent:

-Systematically Assess and Reduce Business Complexity. Product and platform rationalization activities to mitigate the impact of supply scarcity were successful during the pandemic. There is a significant business opportunity to make this a component of ongoing business continuity activities.

-Rationalize Supply Chain Flows. Network design analysis of regional/global flows increased as companies struggled with the downturn in air freight availability and the slower unloading of ocean freight. Before the pandemic, only 9% of companies actively designed their supply chains.

-Reactive is not Responsive. During the pandemic, the cadence of meetings and activity increased. For most organizations, this flurry of activity did not translate to better agility, responsiveness, or resiliency. There is no substitute for well-defined and mature planning processes with clear governance.

-Rethink Work. Organizations quickly and successfully adapted to virtual work environments with some positive outcomes. Virtual meetings facilitated global collaboration in new and surprising ways. A question for all should be, "What is the role of the office post-pandemic?"

-The Differences Between Market-driven and Sales-driven Responses. The traditional definition of demand planning was inadequate. The question for technologists and business leaders is defining demand

management to better use market signals at business speed. There are no easy answers.

-The Folly of IT Standardization. A focus on IT standardization, especially SAP and ERP-centric investments, reduced organizational resiliency and agility in the pandemic. The SAP modeling depth was insufficient, and the tight integration a barrier. The evolution of digital twin capabilities and cognitive computing offers a new horizon of planning for consideration.

-Value of Descriptive Analytics. For most, the flexibility and capabilities of planning were often insufficient. Companies found great value in descriptive analytics. The use of technologies like Power BI, Tableau, and Thoughtspot helped supply chain leaders explain complex supply chain scenarios to executive teams and quickly work through issues. While descriptive analytics lack constraint-based modeling and time-phased prescriptive alerting, there is a lot to learn from the pandemic. Descriptive analytics are reasonably priced and easy to use to enable large organizational initiatives with quick data access. While deep in modeling, planning tools are more difficult to use with access by fewer people.

The pandemic raised the importance of supply chain management to the board room. For many executives, it was intense on-the-job learning. Whether it was the breakdown in demand planning solutions, the elimination of air freight, the shortage of semiconductor components, the need to build virtual office capabilities, or the drive to ensure factory employee safety, the pandemic transformed supply chain thinking. The challenge now is to align the organization to use these insights as a springboard to build improved capabilities.

Conclusion

The Covid-19 pandemic response is an opportunity for organizations to learn powerful lessons. The question now is whether they can parlay these learnings to future benefit by redesigning organizational work systems. For all, the Covid-19 response offers the opportunity to improve future supply chains. The call to action for all is to learn from the past, unlearn the traditional processes and rethink the future supply chain organization to build better.

Methodology and Demographics

This study started with semistructured qualitative interviews of twenty global supply chain leaders. The questions asked were:

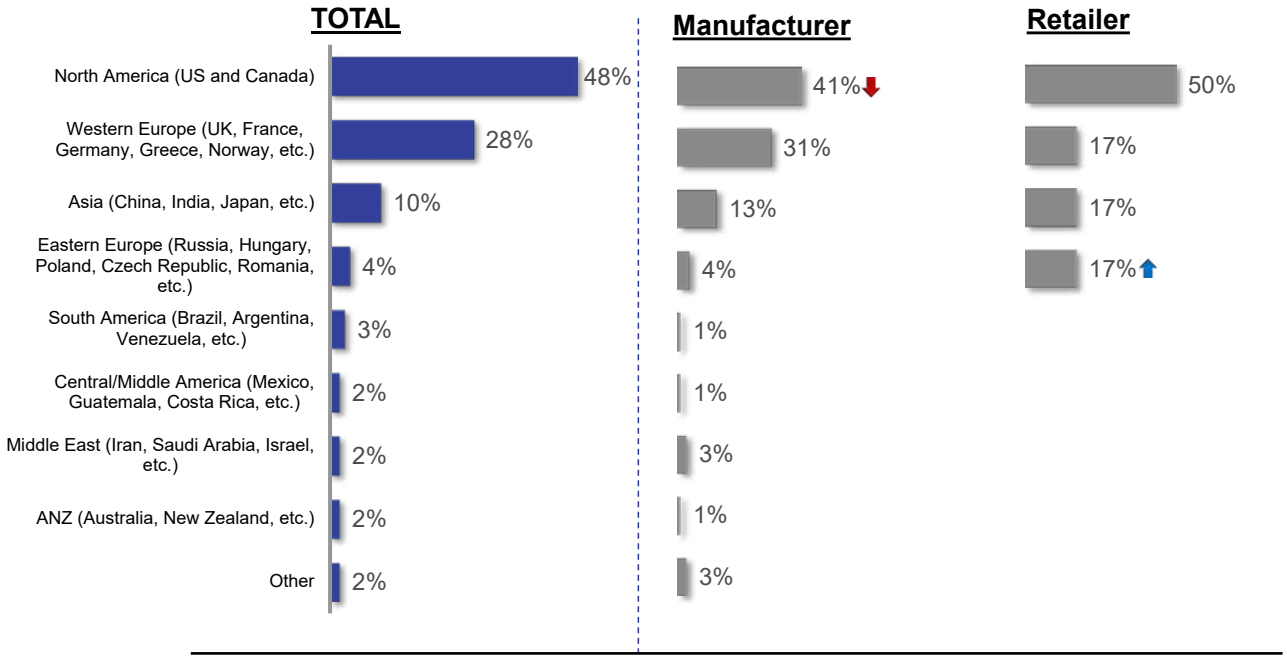
- *With the pandemic, how are your supply chain practices changing?*
- *Biggest impacts?*
- *What is working? Where are there problems? Where are the gaps?*
- *Your lessons learned?*
- *How is the pandemic changing your plans? Investment? Organization?*
- *Anything that we did not ask that you want to share?*

Based on the insights from the qualitative research, we built a quantitative survey to gain insights on the key questions:

Did innovative companies perform better during the pandemic?
Were companies that were better at planning do better during the pandemic?
Did the choice of planning systems matter?
What can we learn from the pandemic response to share more widely with supply chain leaders?

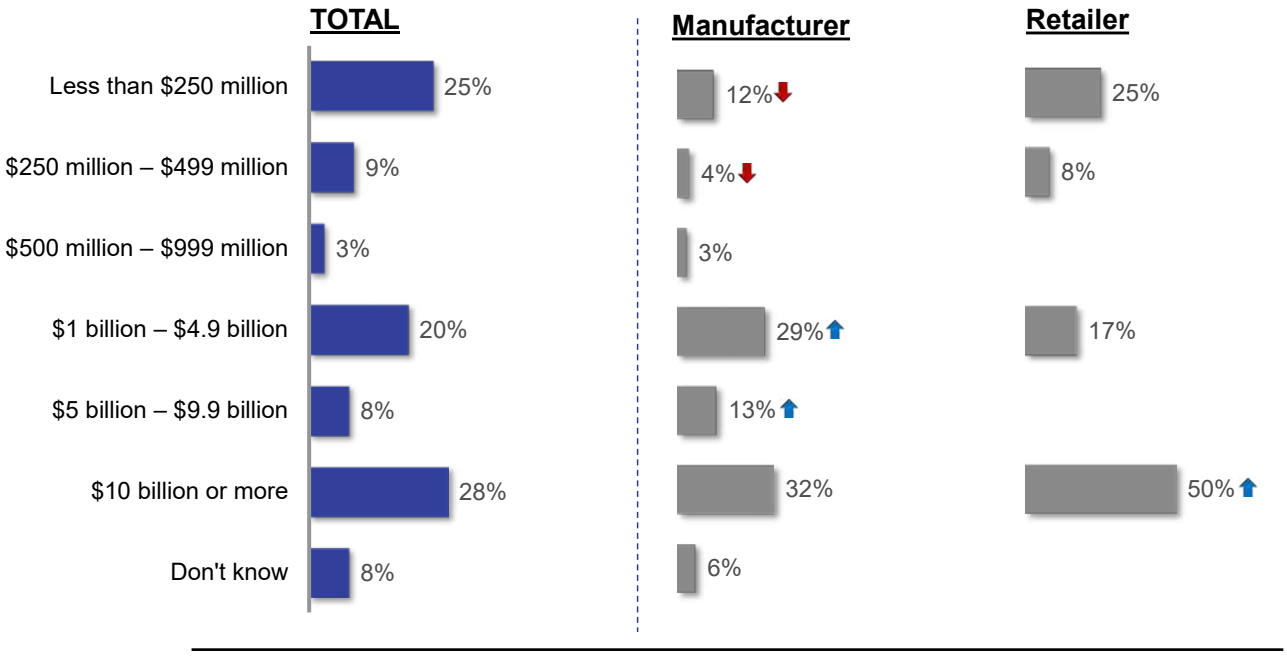
The survey was fielded in August and closed in December 2020. Using LinkedIn connections and email marketing, 118 respondents completed the survey. The majority of the respondents were supply chain planners in manufacturing industries between one-to-five billion in annual revenues. The most common response was from the director level in North America.

Figure A. Location of Respondents



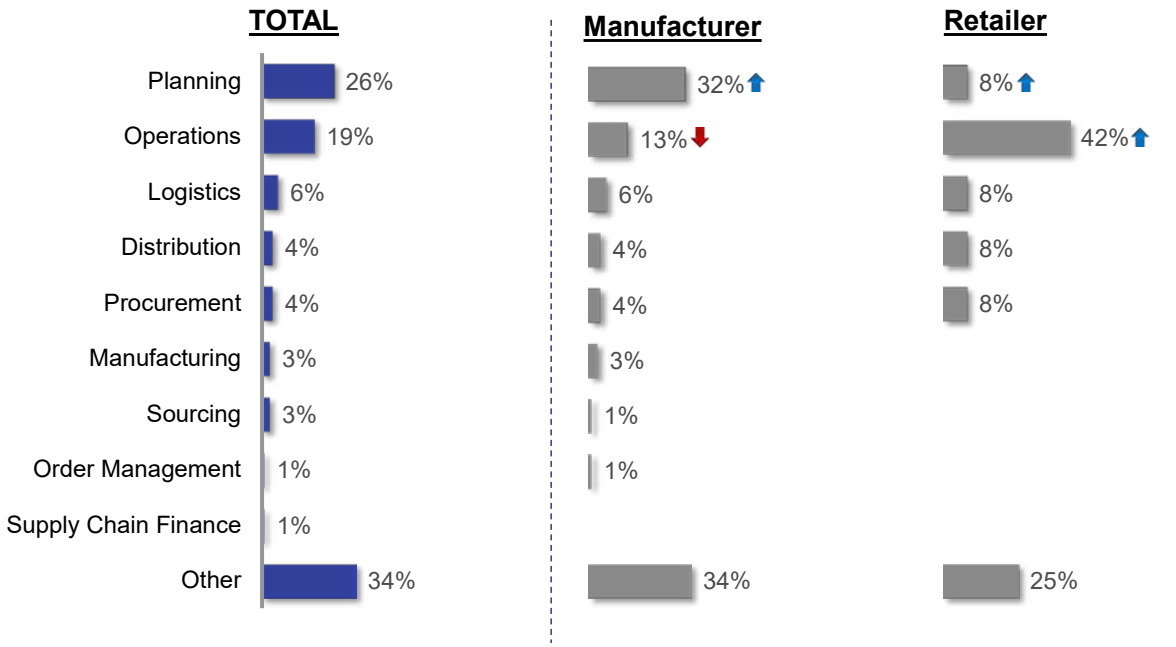
Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q32. In what region of the world are you personally based (physically located) at this time?

Figure B. Revenue of Respondents



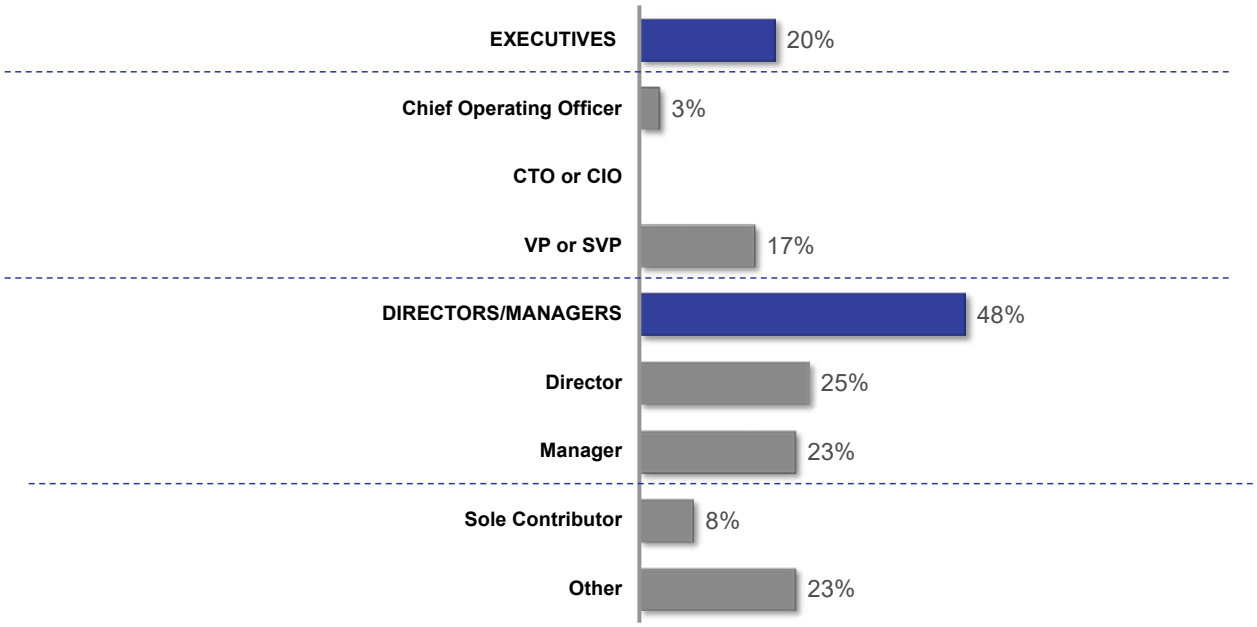
Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q33. Finally, approximately, what was the last fiscal year revenue for your entire company?

Figure C. Respondent by Role



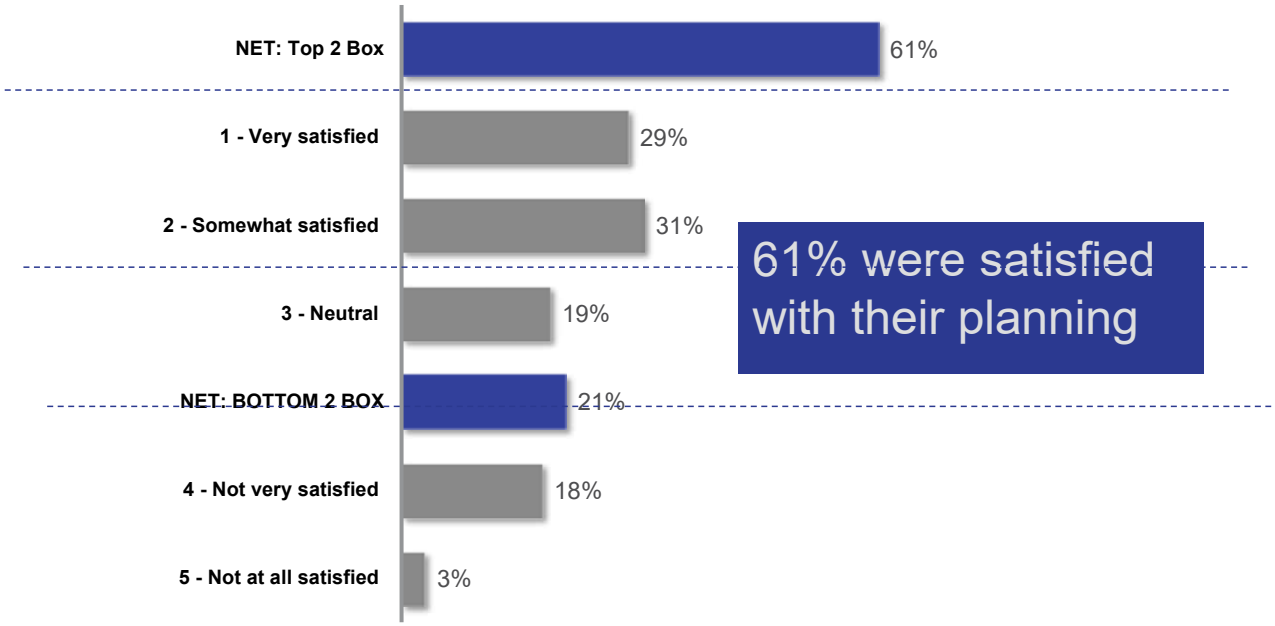
Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q30. Which of the following best describes your current role, even if the terminology isn't exactly right?

Figure D. Roles of Respondents



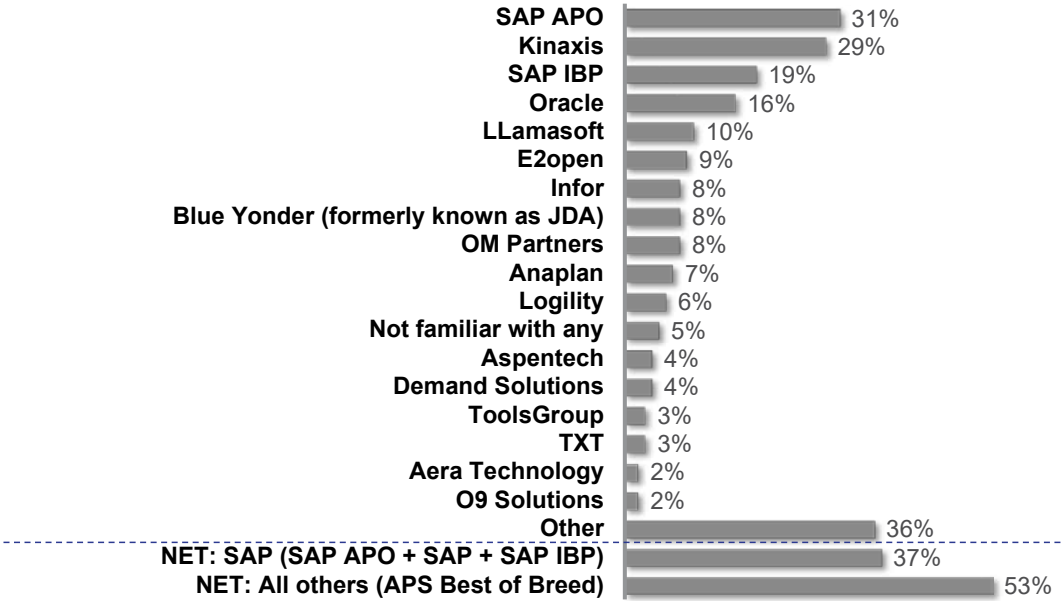
Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q31. What is your current title?

Figure E. Planning Satisfaction



Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q27. How satisfied is your company (for business users) / typical client (for vendors and consultants) with this same software?

Figure F. Planning Systems Used by Respondents



Source: **Supply Chain Insights LLC, Pandemic Study (Sept-Oct, 2020)**
Base: All Answering – (N=118)
Q25. Which of the following supply chain planning software providers does your company own/operate?

About Supply Chain Insights LLC

Founded in February 2012, Supply Chain Insights LLC delivers independent, actionable, and objective advice for supply chain leaders. The company provides open-content research to help companies gain a first-mover advantage.

About Lora Cecere

Lora Cecere (Twitter ID @lcecere) is the Founder of Supply Chain Insights LLC and is the author of the popular enterprise software blog Supply Chain Shaman currently read by over 325,000 supply chain professionals. Also, Lora writes as a LinkedIn Influencer and is a contributor to Forbes. Lora is an author of ten books, including Bricks Matter in 2012 and Metrics that Matter in 2014.

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