White Paper

A New Breed of Cloud Applications Powers Supply Chain Agility and Resiliency

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INTRODUCTION

Whether earthquakes, floods, trade wars, or a pandemic, supply chains are experiencing a bumpy ride. So far in 2020, some industry supply chains have seen significant supply 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.

Those that have both studied and operated supply chains for decades have always talked about the importance of visibility, agility, and resiliency. These terms are common in the cloud world and as a result of the pandemic take on a profoundly more important role in conversation about managing supply chains in an increasingly disruptive world. Indeed, in a recent IDC's *Supply Chain Survey,* when asked about supply chain challenges, resiliency was the most frequently cited gap (see Figure 1).

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 = 816

Source: IDC's *Supply Chain Survey,* 2020

At IDC, we define resiliency as visibility plus agility. It is not enough to be able to see; you must also be able to act. It is not enough to be able to act; you must see where and how to act. A company may see a problem on the horizon, but if its supply chain is too rigid, or brittle, it may simply be relegated to watching the catastrophe unfold. A resilient supply chain, on the other hand, will have multiple "levers" to pull in response to "tremors" to help avoid said catastrophe. That does not mean a resilient supply chain can avoid all problems, but even where such avoidance proves impossible, true resiliency means a faster recovery. Companies that are more resilient tend to share similar characteristics:

- Use integrated, cloud-based supply chain applications – less reliant on spreadsheets.
- Orchestrate supply chains with control towers and integrated digital twins.
- Collaborate across functions and organizations.
- Leverage digital technologies such as artificial intelligence (AI) and advanced analytics.
- Have comprehensive visibility into supply and (to a lesser degree) demand risk.
- Implement predefined crisis management resources.

Although resiliency is not something that can be achieved overnight, there are things that can be done in the near term to better understand the drivers of demand volatility and supply reliability and allow companies to better match supply with demand. When both supply and demand are highly volatile, dynamic collaboration with both suppliers and customers is critical and technology platforms must be adaptive, scalable, and flexible. The "next" normal of 2021 is likely to include supply and demand instability, meaning that supply chains that prioritize resiliency are likely to perform better than those that do not.

The reality based on IDC's surveys and conversations with manufacturers is that most companies are not adequately prepared for disruption. Lean manufacturing, while traditionally a source of value, may limit flexibility, make supply chains more "brittle," and impede resiliency during periods of disruption. Globalization, and the complexity it drives, means that external risks such as a pandemic, climate change, political upheaval, and trade "wars" are going to be more frequent and impactful and the capability to be more resilient is critical.

Dynamic Collaboration: Case in Point

A consortium of 32 industrial, technology, and engineering firms across aerospace, automotive, motorsports, and medical devices unite to dramatically scale up production of ventilators in response to the global pandemic.

"This consortium brings together in real time some of the most innovative companies in the world to create solutions that help millions of people." – CEO, global manufacturer

SUPPLY AND DEMAND SHOCKS

Although most supply chain conversations focus on supply disruptions – automotive parts factories closing in Wuhan or meatpacking plants closing in the U.S. Midwest – the greater concern is demand disruption – something that currently receives less attention. The restoration of supply will not matter if demand does not return. It is not quite that black and white of course, as some demand issues can be traced directly back to supply interruption; but a lot of the demand has been driven by the shuttering of

business activities. Consumer confidence can be a delicate thing; that consumers will flock back to their previous favored businesses may be a bridge too far.

We have seen a relatively quick resolution to most of the supply disruptions. However, that does not mean all supply disruptions; U.S. meatpacking plants, for example, must fundamentally rethink the layout (and age) of their facilities, and the "next normal" for them may be reduced capacity for a while. But a number of senior supply chain executives recently expressed their frustrations with demand issues – not just the decline in demand across many different product categories, but their inability to accurately plan for fluctuations in demand given the range of market uncertainty. One gentleman noted that *"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, so we are largely flying blind."*

The world's largest movie theater chain, AMC, recently expressed pessimism about whether it could stay in business when its revenue has essentially dropped to zero, and some theater chains have closed again, presumably until sometime in 2021. Cash on hand lasted through part of the summer, but not much beyond that. Though not a manufacturing business certainly, movie theaters are a big part of a food service business that have largely disappeared.

Optimized Planning: Case in Point

A global fashion chain constrained by legacy technology struggled to keep up with changing buyer demand. Leveraging the speed, agility, and advanced data management capabilities of a cloud ERP, the business reduced planning cycles for its more than 10,000 items from nine hours to just a few minutes.

"With cloud-enabled optimized planning, we are better able to respond much faster to changes in consumer demand and accelerate planned orders." — IT logistics coordinator, global fashion retail chain, Germany

The term *new normal* is misleading as it implies static rather than dynamic shifts in the market, and that is not the way the world works. The notion of a "next normal" is more accurate. A distinction without a difference perhaps, but it speaks better about the ongoing challenges that supply chains will face in 2021–2022. The "next normal" will not be the same for all industries and, thus by extension, all supply chains. In Figure 2, IDC has attempted to identify four broad recovery profiles ranging from those industries that should see a relatively quick recovery to those that will struggle for a while and may see only a longer-term partial recovery.

FIGURE 2

Industry Recovery Profiles

Recovery Profiles	Description
Largely unaffected	For the most part, these industries are maintaining operations and supply lines, and while spending and growth have been curtailed, demand persists, and they continue to hold up relatively well.
Bounce back	These industries have had less disrupted operations and supply lines and are able to get back up more easily than those industries with major shutdowns and layoffs. They have pulled back technology spending but are anxious to return to pre-COVID-19 plans and budgets and expect demand to be robust.
Fits and starts	These industries have had less disrupted operations and supply lines but are reliant upon consumer demand for a return to some semblance or normalcy and a resumption of normal technology spending. The return of demand is likely to be somewhat slow and skittish.
Slow crawl recovery	Those industries either hardest hit by operations and supply line disruptions or major loss of demand will likely be the slowest to return. Industries with significant layoffs and shutdowns will need to prioritize rehiring and restarting basic operations before technology investments are resumed.

Source: IDC's *Customer Insights and Analysis,* May 2020

In some cases, the recovery is driven by a resolution of supply disruptions, in other cases, it is driven by demand disruptions and, in still others, it is both. In the aforementioned IDC's *Supply Chain Survey,* 73% of the companies responding to the survey felt that their business was vulnerable to supply chain–related business model disruption within five years, a majority of those felt it was likely within one year. Particularly, industries within the "fits and starts" and "slow crawl recovery" profiles will be facing some big questions about their businesses, with the potential for them to pivot to adjacent or even fundamentally different business models. Companies for whom a resilient supply chain can be a significant enabler of a necessary "pivot" will fare much better.

ARCHITECT FOR SUPPLY CHAIN RESILIENCY

Supply chain resiliency does not just happen, it must be architected – resiliency by design. Certainly, supply chains are in better shape today than in the past; they have greater visibility and are more resilient, but, as COVID-19 has shown, there is more to be done. The next disruption might be just around the corner, and that could be much worse.

Risk, Visibility, and Resiliency

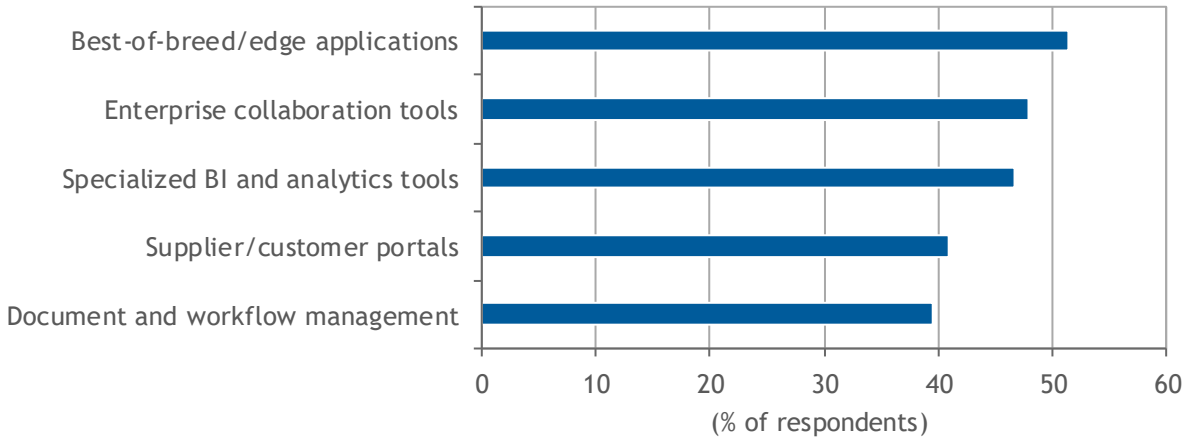
In IDC's 2020 *Supply Chain Survey,* we asked respondent companies about how they would manage risk and enable visibility to achieve supply chain resiliency. The focus for risk and visibility is primarily in supply chain planning (57%) and end-to-end supply chain (56%). Visibility into the factory is at 39% overall but is slightly higher in discrete manufacturing industries. Figure 3 illustrates the tools that

companies expect to use to enable better supply chain visibility. Best-of-breed and edge supply chain applications are the top response, but survey respondents view multiple necessary avenues to better visibility.

FIGURE 3

Risk and Resiliency

Q. How do you plan to improve visibility in your supply chain?



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Source: IDC's *Supply Chain Survey,* 2020

At its core, resiliency is visibility plus agility. It is not enough to see what is happening, you must be able to respond. It is not enough to be able to respond; you must know what to respond to. Understanding the multidimensional nature of risk and creating a resilient supply chain is a worthwhile endeavor, particularly in a world where disruptions appear poised to occur more frequently and with greater severity. At IDC, we define supply chain resiliency as the capability of a supply chain to ensure and preserve the continuity and consistency of product supply and meet business obligations for product delivery and service to customers in the face of both short-term operational and longer-term strategic disruptions. Resiliency is also about the ability to adapt to changing business conditions in near real time while maintaining the business' core purpose and principles. For a manufacturing company whose first principle for supply chain is to be the low-cost provider in its market segment – for example, responding to business disruptions by increasing structural costs over an extended period of time would not be representative of a business that had high levels of resiliency. Likewise, a resilient business whose first principle was service would be able to adapt to disruptions without significant impact to service levels.

Even though discussions of supply chain resiliency have tended to focus on the supply side, it is our view that a proper treatment of resiliency recognizes that there are both supply-side and demand-side issues – and implications. Based on this definition, four areas of focus for resiliency efforts are:

- **Risk assessment:** The vulnerability of the supply chain to both internal and external disruptions
- **Risk mitigation and response planning:** Readiness assessment and the steps the supply chain has taken to be prepared for potential disruptions

- **Event management and coordination:** The operational capability to effectively manage disruptions and communicate status
- **Response execution:** The actual response performance of both mitigation and responsiveness

The manifestations of resiliency, as well as the drivers, vary for different companies. For some, resiliency may be about improving inventory performance (getting to a more "agile" inventory); while for others, resiliency may be about visibility into mixed factory networks; and for still others, resiliency may be about supplier diversification. In some ways, of the previous four steps, risk mitigation and response planning is the most interesting. In some situations, it may be prudent to actively mitigate a risk, prequalifying an additional backup supplier "just in case" for immediate necessary capacity in the event of a disruption as an example. In other cases, the ability to respond more quickly to a disruption and take advantage of limited available alternative may be the best course. If your company is ready to execute secondary plans and your competitors are not, you have the competitive advantage. If they are ready and you are not, you are at a competitive disadvantage.

The Role of SaaS and Cloud

The ability to have both visibility and agility, and thus operate a resilient supply chain, is about people, process, and technology, The latter takes on enormous importance in a world where the velocity and volume of data and the need for decisioning speed must be done in compressed timescales. Today, everything is a potential source of data. The right data from increasingly disparate sources must be identified, unified, and analyzed for insight that can be readily applied as knowledge in decisioning. This is a transformation imperative and an important use case for improving agility.

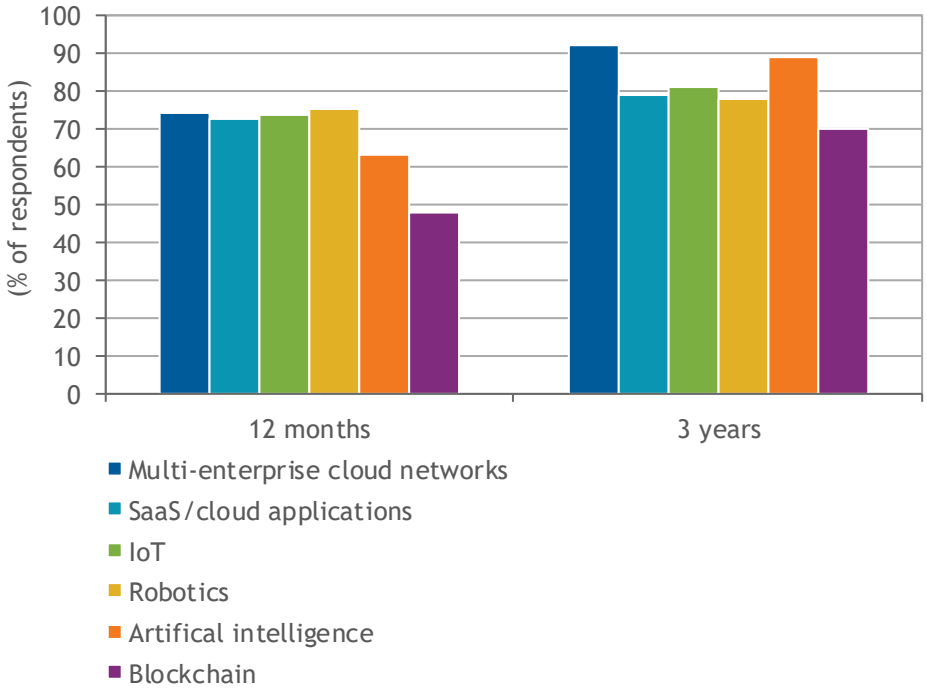
If we think about supply chain visibility and agility through the lens of supply chain orchestration, we see that technology, particularly cloud computing, has allowed what was aspirational to now be operational, practical, and doable. Whether the scalability and flexibility of cloud platforms as a delivery mechanism or the fast, comprehensive advanced analytics that make short work of even very large data sets, today's supply chains surpass the performance of those as recent as five years ago. The growing ubiquity of sensors and devices results in far more data in real time than ever before; and emerging artificial intelligence "assistants" help reduce decision time and risk and improve outcomes, even in light of talent shortages. To mangle a metaphor: you cannot make real-time decisions well if you do not have real-time data. Yet the ability to manage large structured and unstructured data sets in real time places a very large burden on data quality efforts. Artificial intelligence and machine learning (ML) can help here as well to verify taxonomies and adherence to standards, along with block chain as a data integrity technology.

Figure 4 illustrates the cloud-enabled technologies that companies believe are important both today and into the future. Well-connected cloud networks and AI are the two technologies that most stand out as critical to the future of the supply chain. Indeed, improved supply chain orchestration and resiliency require cloud-native supply chain management applications for greater deployment flexibility – ability to situate resources nearest to where work is performed, adaptive and interconnected ecosystems, and intelligent automated cloud solutions, with real-time insights that are optimized for the entire breadth of the supply chain.

FIGURE 4

The Importance of Cloud Computing

Q. How important are the following technologies to the supply chain, both today and in three years?



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Source: IDC's *Supply Chain Survey,* 2020

Cloud-Enabled Visibility and Agility: Case in Point

A large global distributor with 500 franchisees and more than 20,000 products struggled to get a complete omni-channel view of the customer due to disconnected systems and siloed data. The organization migrated legacy applications to a cloud-native intelligent ERP to increase agility and scalability and to have full transparency into products on order and logistics. The outcomes included one-click order to delivery and a frictionless customer experience.

"The main reason to leverage the Dynamics 365 platform is time to value-add. The mantra for us is scalability and agility — they're the two things that we bear in mind with everything we do. It's really to be able to provide a better experience to the customer." — CIO, global health distributor

Modern Intelligent Retail: Case in Point

A large regional consumer entertainment retailer set out to transform the experience for customers. To do this, the company needed a new warehouse management system to increase efficiency to ensure fast, reliable access to goods and ensure it had complete data transparency across the organization. Part of this transformation included modernizing the in-store and online retail experience and create a data-driven, resilient supply chain. The warehouse management system also needed to easily integrate with different point-of-sales systems and real-time freight tracking system. Important considerations in the decision were to minimize disruption to the business and ensure the platform could quickly adapt to whatever changes lie ahead.

"Even with the modifications and integration required, the support of Microsoft FastTrack meant we were able to deploy Dynamics 365 Supply Chain Management for warehouse management in just four months. The fact that the core environment is cloud based, software as a service, you can integrate quickly to Azure." — Group technology director, home entertainment retailer and distributor

IT organizations have focused on enhancing the resilience of their systems and datacenters for decades. Similarly, cloud service providers relentlessly invest to ensure high availability, resiliency of their infrastructure and platform offerings, and a continuous flow of innovative services to support business transformation. Nevertheless, as digital ecosystems have expanded, the supply chain has been something of an adoption laggard, and the resulting resiliency of supply chain IT systems has become more difficult to assess. For example, an ERP application may be hosted in a resilient cloud environment in one or multiple geographic locations. As with all critical applications, the ERP solution relies on regular updates, patches, and support provided by geographically dispersed teams. These teams are also dependent on different software development toolsets and repositories that are hosted in different cloud and off-cloud environments.

A new generation of cloud ERP and supply chain applications featuring cloud-native architecture for greater portability across public, private, and edge clouds; autonomous capabilities powered by AI and machine learning; and advanced and predictive analytics form the essential foundation for digital transformation. Modern cloud applications run on powerful platforms that simplify integration across disparate systems, help unify data silos, and accelerate the development and deployment of new services – all vital for sustainable competitive advantage during highly volatile times. These modern systems of record transform supply chains from fixed entities into highly resilient and adaptable global business networks that are better able to respond to external shocks.

The resilience of the supply chain is highly dependent on the capability of the organization to communicate and work effectively. As organizational links in the availability of IT tools in the supply chain are broken, whether due to technical reasons such as power or telecommunications outages or due to pandemics, the results are the same, and the effective operation of critical cloud applications is impacted.

BENEFITS

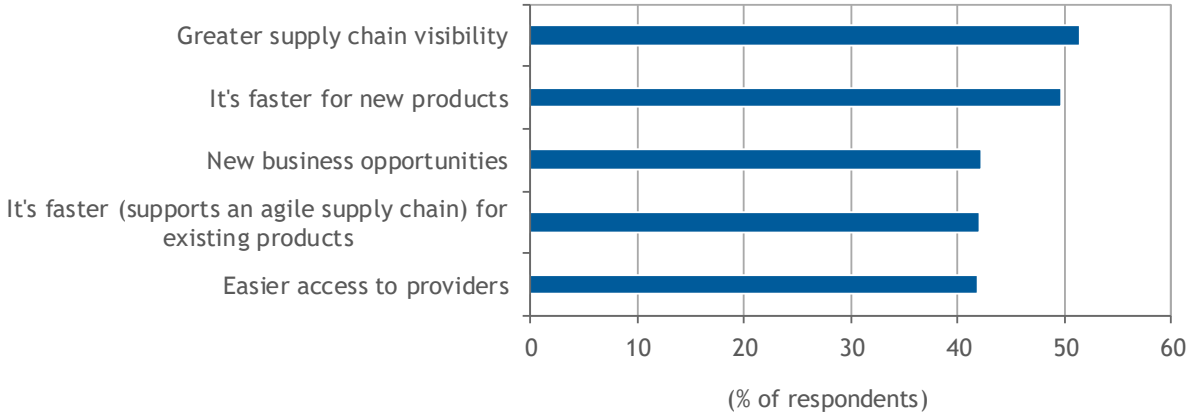
The enterprise is more distributed than ever. Modernization of the supply chain with integrated cloud applications to derive agility and resiliency delivers substantial benefits to manufacturers. Generally, the integration of cloud technologies has driven better visibility and tends to allow the supply chain to be faster and open new business opportunities (see Figure 5). Other benefits include:

- Enable upstream supply chain resiliency – event driven, see, and respond.
- Navigate disruption from positions of strength – 60% of companies expect to be disrupted within a year.
- Leverage digital twin technologies for scenario and risk modeling.
- Increase productivity and reduce response time with automation (and digitization).
- Speed time to market.
- Increase innovation velocity.
- Provide real-time and predictive analytics for 360-degree visibility.
- Streamline integration to legacy and third-party systems.
- Extend and create new services on a powerful digital platform.
- Scale on demand in response to variations in business.

FIGURE 5

Global Supply Chain — The Power of the Network

Q. What have been the main benefits to adopting technology within your supply chain?



n = 816

Source: IDC's *Supply Chain Survey,* 2020

MICROSOFT TECHNOLOGY PROFILE

Microsoft is dedicated to advancing human and organizational achievement as well as empowering customers worldwide. As a data-driven company, it enables its customers to digitally transform by capturing data from every aspect of a business and applying intelligence to extract value from that

data. This leads to better engagement with customers, more ways to empower employees, and new opportunities to optimize operations.

Microsoft's unified platform and seamless integration with other tools are clear competitive differentiators. Microsoft Dynamics 365 works together with Office 365, Azure, advanced AI technologies, mixed reality applications, and Microsoft Power Platform to enable people to get their work done more efficiently and more effectively.

Dynamics 365 Supply Chain Management helps organizations meet the fast-changing customer demand, by performing production and distribution planning with in-memory microservice in a matter of minutes. It enables them to resolve demand and supply imbalances by enhancing visibility of their supply chain and inventory in real time. They can easily scale to handle large volumes of transactions while fulfilling orders from multiple channels, mitigate stock-outs and overstocking, and seamlessly integrate with third-party systems.

Dynamics 365 Supply Chain Management offers an integrated out-of-the-box warehouse management system that enables companies to consistently deliver products on time. They can create no-code/low-code customized heatmaps and automate workflows to optimize capacity, layout, consumption, and flow of raw and finished goods in real time.

Companies can further create a connected factory of the future with sustainable and adaptable manufacturing processes that use AI, IoT, and mixed reality to accelerate product innovation and time to market and prevent any unplanned equipment downtime by performing proactive maintenance. They can improve workforce safety and efficiency while eliminating costly errors with hands-free and interactive delivery of work instructions.

Dynamics 365 Supply Chain Management helps organizations build a resilient supply chain by keeping critical manufacturing and warehouse processes running 24 x 7 at high throughput on the cloud or edge and ensure business continuity in remote locations when disconnected from the cloud. It is an agile solution that can integrate with other business applications and unify data from multiple sources in real time. It helps organizations increase competitive advantage, overcome adversity, and proactively detect opportunities all the way from planning to procurement to manufacturing to distribution, order orchestration, and delivery.

CHALLENGES

One certainty has emerged from the pandemic; disruptions, whether economic, social, or market, will continue to challenge all but the best prepared organizations. Chance certainly favors the digitally prepared. Unburdened by the time and cost constraints of legacy technology, digital businesses can sense and respond to changing trends and emerging threats faster and with greater efficacy.

Everything is a source of data, and the volume and velocity far exceed the organization's ability to ingest, store, and analyze the data. The challenge lies in identifying and curating the right data that can then be analyzed for insight to improve decisioning.

Competitive advantage increasingly relies on orchestrating and managing resources that are outside of the organization's direct control and distributed across ecosystems and supply and value chains. This is a significant strategic shift that can confound even the best managed businesses.

CONCLUSION

IDC believes that managing supply chain risk in a measured, transparent way will be a crucial component of future best-in-class supply chains. Yet, as COVID-19 is showing, it is also critically important for companies today. Companies that run resilient supply chains will outperform those that do not.

In the short term, supply chains should implement business continuity assessments to evaluate the recovery requirements of the supply network and look across the entire network of suppliers (components/ingredients, OEMs, logistics, and finished goods) and adjust the process based on the significance of the supplier. 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 require the full power of 3rd Platform technologies (e.g., cloud, AI/ML, analytics, and ecosystem networks) working in concert with both upstream and downstream IT systems that support product development, procurement, supply chain planning, supply chain execution, and postsale service execution.

In the longer term, IDC recommends revisiting, modernizing, and creating local as well as global supply chain contingency plans by leveraging the full span of digitized tools, which include modern robotics, drones, and automated vehicles integrated to intelligent operational systems as part of flexible and dynamic workflows.

As we noted previously on the impact of the COVID-19 pandemic, it is past time for supply chains to take a structured, proactive stance against risk. Whether it's the next disease outbreak, the next war, further trade conflicts, or climate change–related weather disruptions, your supply chain will be affected. Don't just work on alternative plans, though that is a good start; develop the structural capabilities to be a resilient supply chain.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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