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Looking beyond the horizon

Preparing today's supply chains to thrive in uncertainty

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Looking beyond recovery

THE COVID-19 PANDEMIC has laid bare many of the long-standing vulnerabilities and risks lurking in organizations' supply chains. In some cases, it has caused companies to take a hard look at their processes and their business models. In others, it has opened new opportunities for innovation, growth, and competitive advantage in the postpandemic world. Overall, it has demonstrated the power of interconnected, digital supply networks (DSNs) to enable organizations to anticipate, sense, and respond to unexpected changes and minimize their impacts.

To be sure, the challenges during the COVID-19 pandemic didn't reveal the interdependent or global nature of supply chains; rather, they highlighted that most organizations aren't set up to manage this interconnectivity when adverse impacts occur. In short, the pandemic has shown that if companies want to move forward into a future where they can thrive, they likely need to change.

But beyond the immediate economic and operational challenges created by the COVID-19 pandemic, what might supply networks in the postpandemic world look like? Despite the profound shifts we've experienced over the past year, the future of supply chains doesn't look all that different from how we previously imagined it— we expect to simply get there much faster. To "get there," however, supply chain leaders seeking to

prepare their organizations' supply chain processes for thriving postpandemic can focus on three key areas:

1. **Recognize shifts in your customers, business operations and technologies, ecosystems, and workforce:** Four fundamental realities have shifted rapidly due to COVID-19. Each of these shifts can have direct and indirect implications for supply chains.

2. **Assess your organization's ability to thrive amid these shifts:** Supply chain leaders can consider a series of questions to evaluate their organization's readiness to deliver amid these shifts.

3. **Position the organization to thrive:** As they assess their readiness across these four shifts, leaders can take three overarching tactical steps today to prepare their organizations to thrive.

As part of Deloitte's *Respond, Recover, Thrive* supply chain series, this report examines how organizations can revisit their supply chain strategies in light of all they have learned during the pandemic, and prioritize the capabilities they expect to require going forward to **thrive** in this new normal.

Recognize shifts in your customers, business operations and technologies, ecosystems, and workforce

WHILE THE PANDEMIC is still unfolding and its long-term effects are still unknown, what *is* clear is that the crisis seems to have helped accelerate fundamental shifts in what customers value, how customers buy, and how businesses need to operate differently to meet customer requirements and earn their trust and loyalty (figure 1).

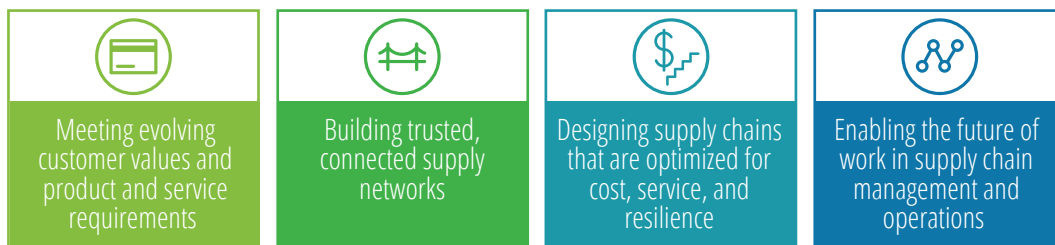## Meeting evolving customer values and product and service requirements

Post–COVID-19, the expectation for quick and seamless on-demand delivery will likely require companies to collaborate with ecosystem partners in increasingly complex fulfillment networks.[1] Furthermore, comprehensive omnichannel approaches—underpinned by customer data to enable a tailored and personalized experience—could increasingly replace more traditional, isolated channel strategies.

Few companies will be immune to these shifts. Indeed, these expectations are likely to extend beyond business-to-consumer companies to include the business-to-business (B2B) world. While there will likely always be some differences between how the two domains operate, research suggests that B2B customers will increasingly expect a superior commercial experience akin to the one they receive in their personal lives.[2] Examples include tailored product/service offerings, self-service order portals, seamless order processing and billing, shipment tracking, and no-hassle returns.

FIGURE 1

Key supply chain shifts in the new normal

| Meeting evolving customer values and product and service requirements | Building trusted, connected supply networks | Designing supply chains that are optimized for cost, service, and resilience | Enabling the future of work in supply chain management and operations |

Source: Deloitte analysis.

The values of corporate purpose, trust, and sustainability have also become more important.[3] Although many companies have historically shied away from commenting on societal issues or reporting sustainability goals, organizations—and their leaders—will likely be increasingly required to demonstrate progress on these topics, especially after the pandemic.

In a recent global survey, both millennials and Gen Z consumers said that they will make a special effort to support businesses—especially smaller local sellers—after the pandemic, and they won't hesitate to avoid companies whose stated and practiced values don't match their own values.[4] Further, a 2020 study by the Manufacturer's Alliance for Productivity and Innovation found that 74% of manufacturers expected that reporting on environmental, social, and governance (ESG) goals would become table stakes as early as within a year.[5] Organizations' ability to provide proof of execution against these commitments might become a requirement. This would reshape and reinforce the need for transparency—and redefine what trust and sustainability mean in a supply chain.

Assessing your ability to thrive: Next steps to consider for customers and product/service requirements

Leaders should evaluate their ability to market and sell their products and services in the post–COVID-19 world. Some of the important areas to consider include:

Serving the connected customer

The pandemic has contributed to the replacement of brick and mortar by e-commerce. Yet apart from a few select industries, such as retail, many industries and organizations are not prepared to completely abandon in-person customer interaction. What does this mean for their supply chains? As you look forward, consider the following:

- How diversified are our sales channels, and are we prepared to market to and fulfill orders from a fully digital customer base?

- Do we have the IT infrastructure to enable self-service (i.e., product research), online support, seamless order placement and fulfillment, and shipment track and trace?

- Are we able to track online customer engagement metrics and leverage that data to inform planning and forecasting?

Customizing the product and service portfolio

Portfolio optimization takes on renewed importance during critical junctures in economic and business life cycles. Key questions you can ask include:

- Is there a measurement for the impact and importance of each product or service relative to its current and future profitability and growth potential?

- How does the product mix impact the complexity and cost drivers of our supply chain, such as production scheduling, overall equipment effectiveness, and storage and package configurations?

- Are there tangible measures for the real (or perceived) environmental or societal impact, both pre- and postproduction, of our company's products?

Positioning for profitability

With resources increasingly constrained, leaders should prioritize subsets of customers and aligned services, and manage supply chains accordingly by considering the following:

- Does our organization segment its customers based on profitability percentage, total margin contribution, strategic importance, growth potential, or some other measure?

- Do our employees regularly engage with the highest-value customers to understand the potential for additional services or enhancements, to inform pricing strategies across customer tiers?

- How well does our organization understand our cost-to-serve on a customer-by-customer and transaction-by-transaction basis?

The answers to these questions focus on the intersection of supply chains, new product development, customer strategy, sales, and finance. Organizations should take a renewed end-to-end look at their customers, products, and operations through a "cost-to-serve" lens and make informed choices that balance cost and effort with value, perceived willingness to pay, and sustainable business growth.

Building trusted, connected supply networks

We have long explored how traditional linear supply chains optimized for a single business or function are transforming into trusted DSNs.[6] When done in isolation (i.e., "random acts of digital"), technology investments often serve to optimize only a component of the value chain, not the whole. In the DSN model, however, functional silos are broken down both within an organization as well as outwardly to include customers and suppliers (and in some cases, suppliers' suppliers) to enable end-to-end visibility, collaboration, responsiveness, agility, and optimization.[7] In fact, as linear supply chains evolve into DSNs, the companies best positioned for growth may be those that see these networks as core to their business, technology, and operational strategies.

Increasingly, DSNs are being designed and built to anticipate disruptions and reconfigure themselves

to mitigate impacts across the extended partner ecosystem.[8] COVID-19 presented an opportunity to pressure test whether DSNs could deliver on their promise—and highlighted the importance of a fully connected DSN—not just within the organization but also end to end across the ecosystem.

The key to automated, predictive, and prescriptive operations in the post–COVID-19 world lies in the interconnectivity of digital tools, physical infrastructure, and their underlying data streams. Tools such as the Internet of Things, cloud computing, and 5G make it possible to create new sources of data from the physical attributes of a supply chain (e.g., machine vibration tolerance, truck route deviations, carbon emission yield increases), and interpret, curate, and visualize that data in meaningful ways to make business decisions. Artificial intelligence (AI), machine learning, and robotics can augment and enhance the human workforce to improve efficiency, productivity, and safety in factories, warehouses, call centers, and transit. Finally, data lakes or control towers can bring cross-functional tools and processes together and apply advanced applications to ensure DSNs are optimized to thrive—and trusted to continue to operate and adjust amid unexpected disruptions.

Assessing your ability to thrive: Next steps to consider for building trusted, connected supply networks

Some of the topics that supply chain leaders should consider to better prepare for future contingencies include:

Advancing the interconnected DSN

Moving into thrive requires supply chains to leverage connection points in the network to sense and respond to sudden changes in demand and supply and optimize operations. Key questions supply chain leaders should consider in this area include:

- Are our planning systems able to sense or predict potential changes in demand due to changing customer preferences or broader macroeconomic trends?

- Are our production assets smart enough to proactively alert us to potential maintenance and uptime issues?

- Are our logistics operations optimized (including shipment scheduling, mode-switching, route optimization, tracking and tracing, inventory rebalancing, and network footprint changes)—not just on a cost basis but also considering cost/resilience trade-offs?

Automating operations

Given the rapid advancements in automation technologies, leaders can find it difficult to select the applications that are most suited for their purpose and trust the results.[9] Some common considerations for process automation, AI, and machine learning include:

- How much time is spent on repeatable or administrative tasks (e.g., record-keeping) or interpreting raw data for insights into operation improvement opportunities?

- Where can data integration and business rules be applied to replace, augment, or accelerate human decision-making?

As the COVID-19 crisis continues to evolve, end-to-end visibility and collaboration across the supply chain can be critical to ensuring that the network will continue to function as intended. Otherwise, in its absence, manual interventions could be needed to adjust to disruptions—typically an inefficient and costly approach.

Designing supply chains that are optimized for cost, service, and **resilience**

Even as business and commerce have grown ever more globalized, supply chains have generally moved in the opposite direction, growing more regionalized to meet local demand. This approach, known as near-shoring, taps into production capacity closer to prime markets. The COVID-19 pandemic further reinforced the value of being closer to the end customer, enabling a higher degree of control.

At the same time, however, it also exposed the need for companies to diversify their supply sources beyond a single country or region and to gain a deeper understanding of their extended ecosystem, including their suppliers' suppliers. Supplier diversification had already been gaining traction in recent years, as rising costs and geopolitical risk from trade wars have prompted organizations to supplement their traditional supply networks with infrastructure in a second, typically lower-cost country. However, COVID-19 highlighted how those strategies might have been superficial at best, since many production locations still rely heavily on the same suppliers. The result was the illusion of resilience, rather than true diversification.

Leading organizations can apply advanced technologies to fundamentally rethink their supply chains, enhance their real-time understanding of activity in complex supply networks, and leverage continuous scenario planning to optimize the balance of cost against risk and agility of their production capacity footprint.

Designing a supply chain that is both resilient *and* efficient while addressing increasingly complex and nuanced markets is challenging. Organizations will have to consider multiple dimensions: proximity to customer markets, diverse customer service requirements (including aftersales service and reverse logistics), sources of raw materials, proximity to key suppliers and ecosystem partners, availability of skilled labor (and overall talent availability), infrastructure (energy, logistics, education), business disruption risk, laws and regulations (including intellectual property

protection, customs, duties, and taxes), and ESG considerations—to name just a few. But the payoff can be a more resilient supply chain, better prepared to weather future disruptions with fewer impacts to cost and service.

Assessing your ability to thrive: Next steps to consider for designing optimized, resilient supply chains

COVID-19 has highlighted both the importance of supply chain resilience as well as the challenge of associated costs, whether for minimizing cost or ensuring business continuity. Recognizing the importance of both ends of this spectrum is important when evaluating how the supply chain should be structured in the longer term.

Balancing the global supply chain footprint

Analyzing your plant and distribution network can yield significant resilience improvements (not to mention cost savings). Some questions to consider include:

- Is our network over-reliant on specific regions— particularly those that may be prone to supply chain disruptions (e.g., due to regulatory or geopolitical factors)?

- Have we conducted a detailed disruption scenario analysis considering factors such as unplanned production downtime, impacts to warehouse and terminal usability, weather changes, and port and rail congestion to determine potential weaknesses?

Reexamining the extended, multitier supplier network

While leaders' immediate reactions to the pandemic may have been to rein in global supply networks, the following questions might help provide perspective in balancing risks and costs:

- Does our supply chain involve multiple suppliers across a range of local, regional, and global locations to support operations?

- What do we know about the supplier bases of our suppliers? Are our systems connected to those of our suppliers and customers (i.e., would a disruption at a first- or second-tier supplier trigger an alert to our planning systems)?

- Are we able to automatically and dynamically reallocate volumes across our suppliers based on anticipated delivery risk, quality, timeliness, and cost metrics? Do we understand the profitability impact of doing so?

- Are we able to proactively monitor and assess the health and resilience of our suppliers, and incorporate those results into contracting decisions?

- Can we adequately assess cost-to-serve/ profitability vs. risk/resiliency tolerance of given supplier network configurations?

Optimizing inventory

Your inventory strategy should support and complement your commercial strategy—balancing both customer- and product-level considerations (e.g., make-to-order vs. make-to-stock, lead time commitments, stocking locations and pooling strategy, minimum order quantities, desired service levels). Some questions include:

- Do we conduct analyses (including historical data as well as potential future disruptions) on how much inventory to carry at the stock-keeping unit and location level?[10]

- Does our scenario analysis adjust inventory for variability in demand and supply, production and transportation lead times, shipment frequencies, batch sizes, etc.?

- Can our inventory management systems automatically rebalance inventories across the network?

Organizations should assess risk throughout their value chains and establish assurance plans to meet an appropriate risk-adjusted, optimized outcome for each area—one that balances disruption costs with the value of assurance and service.

Enabling the future of work in supply chain management and operations

The workplace, workforce, and the nature of work itself will perhaps undergo some of the most dramatic changes in the wake of COVID-19.

The pandemic proved to many of us that remote work is not only possible but effective. The notion of where work can be done (i.e., the *workplace*) will likely continue its shift from an in-person environment to a more distributed model as organizations increasingly adopt tools for remote working. In a Deloitte June 2020 study, CEOs said that they expect a third of their workforce to be working in a full-time remote capacity by 2022, and even earlier in some cases.[11]

These trends are not just limited to traditional office work; they extend to the shop floor and throughout the supply network. In fact, many manufacturers are likely to spend more on data management capabilities aimed at facilitating remote operations and improving operational efficiency. For example, Norsk Hydro, a Norway-based aluminum manufacturer that experienced limited access to plant infrastructure during the pandemic, plans to expand its data capabilities to remotely run and monitor plant equipment for improved resilience.[12]

In addition to the evolving landscape of where work can be done, the *workforce* itself is also changing as companies augment their traditional full-time employment models with contract workers and gig workers.[13] With the growing share of alternative workers, companies should think creatively about how to train and leverage them effectively. Flexible talent mobility policies—which can be leveraged both internally as well as within the overall ecosystem of suppliers—enable organizations to quickly adjust their workforce as the need for talent evolves.

More generally, advancements in process automation tools such as AI, machine learning, robotics, natural language processing and generation, autonomous driving, and computer visioning can augment workers, creating more value.[14] In another recent Deloitte study, 79% of manufacturers reported that expecting their AI investment to increase over the next year, while 76% expect AI to be integrated into all enterprise applications within three years.[15]

Finally, the definition of *work* itself is shifting. Advanced connectivity and optimization techniques have presented unique opportunities and challenges for plant managers and technicians: running and monitoring entire plant operations remotely, automatically balancing sudden spikes and troughs in demand-supply patterns across multiple plants, and others. While these efforts were already underway for some companies before the pandemic, COVID-19 pushed others to follow suit quickly and made these elements an integral characteristic of tomorrow's supply chains. Supply chain managers should view their operations with a critical lens, challenging the status quo of where and how work is performed, and who performs it—enabling greater benefit to the organization and its stakeholders.

Assessing your ability to thrive: Next steps to consider for enabling the future of work in supply chain management and operations

As we head into the postpandemic world, it will not be enough to merely think about plexiglass dividers

and temperature checks; those considerations, while important, only achieve the near-term goal of returning to work. Instead, organizations will likely need to rearchitect how they think about work, how they unleash their workforce's potential, and how they adapt the workplace to accommodate both physical and virtual environments.

Rearchitecting work for the future

Challenge the assumption that *work* can remain largely the same as it was before. Doing so would overlook an opportunity to reevaluate and rearchitect work to accelerate productivity and growth. Some questions for leaders to consider include:

- Is our organization focusing on the right work outcomes to drive our business forward and unleash productivity and new value?

- Are we thinking of technology as a means of substitution, or as an enabler to augment work and drive better collaboration?

- Has our organization begun to explore augmented and virtual reality technologies (e.g., computer visioning to identify safety and quality issues, wearables to guide maintenance and repair activities, digital twins to enable remote or rapid troubleshooting)?

Unleashing the full potential of your workforce

Organizations can unleash the full potential of their *workforce* by enabling people, teams, and intelligent machines to work together to solve problems, gain insights, and deliver more value while creating more meaningful work. To assess whether your organization is prepared, leaders should ask themselves:

- Do we understand the capabilities we need, and where the best places are to find those capabilities (e.g., through the gig economy, alliance partners, technology solutions)?

- How will we educate and develop the workforce to gain these capabilities, including working alongside new or enhanced systems and partners?

- How should we be leading, rewarding, or incentivizing the workforce to drive the productivity gains our organization needs to thrive?

Adapting the workplace to the future

The *workplace* of the future is a dynamic place where employees, customers, and partners come together, and technology helps people communicate, collaborate, and interact, whether physically or virtually. Leaders should ask themselves:

- Have we created an effective virtual and physical workplace that allows the organization to thrive—and one suited to the work itself (e.g., physical space for team collaboration, digital tools for asynchronous design)?

- Have we empowered workers with the tools, technology, and trust to choose where and how they do their work?

- Have we created a culture that promotes adaptability, enables teaming, and teaches leaders how to lead their teams in both a physical and virtual environment?

Ultimately, the future of work is much more than a shift from a physical to virtual environment. To recruit, empower, and retain the best talent, and to build an organization that is truly adaptable, leaders should embrace all the changing elements in the future of work.

Next steps
Positioning the organization to thrive

IT'S DIFFICULT TO predict the extent and duration of COVID-19's impact on global economies, businesses, and lives. Adapting to these four shifts takes hard work, honest assessments, and a long-term lens on investment. So, what sort of capabilities should supply chain executives consider deploying now as they continue to build out their DSNs in a thrive environment?

We expect the answer to evolve alongside the technology curve. Leaders can consider multiple actions now to adapt their supply chains to these shifts (figure 2), so they can thrive in the postpandemic world: An age where humans and robots share the factory floor as well as the corporate office; where algorithms predict demand patterns and determine scheduling sequence; where global value chains can be viewed from a centralized control tower using AI or machine learning to assess operations, manage performance across networks, trigger alerts and initiate mitigating action; where the trade-off of cost vs. service is weighted to consider multitiered risk and resiliency; and where supply chains are fully synchronized and dynamically optimized from source supplier to end customer.

Make the supply chain an integral part of the corporate strategy. For companies competing on a global scale, things can change quickly—and not just from unexpected breaks in the supply chain caused by a pandemic, but disruptive technologies or abrupt market shifts as well. All too often, supply chain strategy and business strategy have been kept separate. Driven by greater global complexity and the enormous stress that has been placed on networks—from higher customer expectations to dynamic delivery solutions—companies should challenge the long-held orthodoxy that supply chains exist simply to meet the commercial needs of the business. Instead, supply chain considerations should become central to business strategy.

Lay the digital foundations to enable the corporate strategy. Ten years ago, having a standard enterprise resource planning, transportation, and inventory solution was typically adequate to meet the needs of the market. However, technical advancements have transformed the supply chain landscape. Data has become the new currency upon which success or failure can be measured. It is, therefore, essential

FIGURE 2

Three steps for supply chain transition and growth in the postpandemic world

| Make the supply chain an integral part of the corporate strategy | Lay the digital foundations to enable the corporate strategy | Identify what (and who) you'll need to get it done |

Source: Deloitte analysis.

to determine how data and technology will enable business and supply chain objectives, and where it is critical to lease vs. buy these capabilities. Technology solutions have historically been expensive, housed on site, and difficult to replace without major capital outlay. Given the rise of cloud-based solutions, supply chain executives have access to lower-cost products from a range of innovative providers.[16] Supply chain leaders can thus rethink their company's technology strategy as a means of driving increased innovation and nimbleness at lower cost and faster speed to market.

Identify what (and who) you'll need to get it done. While there will be some return to prepandemic work arrangements, many of the new practices and trends are likely to stay.[17] Therefore, supply chain leaders should take an active role in

planning and designing for their organization's future of work— particularly with respect to identifying areas for automation within the supply chain, and determining where and how to redeploy (and upskill) the workforce, and what skills and capabilities they'll need to set themselves up for growth.[18]

While COVID-19 certainly caught the world unprepared, the fundamentals of what it will take to compete in the postpandemic world shouldn't. In many cases, the seeds for change were sewn long before "social distancing" and "Zooming" became household terms. And while there is undoubtedly a steep road ahead for many, those supply chain organizations that can embrace the new normal, invest in the future, and embrace interconnectivity and transparency could be best positioned to thrive.

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