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The digital supply network meets the future of work

People, machines, and a new era of collaboration

Deloitte Consulting LLP's Supply Chain and Manufacturing Operations practice helps companies understand and address opportunities to apply Industry 4.0 technologies in pursuit of their business objectives. Our insights into additive manufacturing, the Internet of Things, and analytics enable us to help organizations reassess their people, processes, and technologies in light of advanced manufacturing practices that are evolving every day.

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The future of manufacturing, the future of talent

The increasing power and capability of machines in the digital supply network (DSN) may portend a change in what organizations ask of their workers, in terms of required skills, tasks, and roles. In the coming years, perhaps sooner than later, almost all work will likely involve people working alongside technology or robots they are not currently working with today.

NAVIGATING the future of work can be a new and confounding challenge to many supply chain executives who may already be struggling with what their organizations may look like in a novel, more interconnected age. And it can be difficult to identify and prepare for the workforce of the future when the impacts of the DSN on roles and functions are still very much evolving (see the sidebar "A brief look at the digital supply network" to learn more). But with this uncertainty comes the opportunity—and perhaps what many would consider a requirement—to rethink the role of talent in supply chains and discover the potential power of people and machines working together.

The addition of advanced technology to a workplace can spur the fear of robots replacing human workers. Certainly, the introduction of advanced technologies could eliminate some tasks and reduce the need for some roles. At the same time, however, it also could lead to the creation of some new tasks and roles. In the United Kingdom, for example, technology has helped to create 3.5 million *new* jobs between 2001 and 2015, even while it has contributed to the loss of 800,000 other jobs.[1] The potentially larger and more urgent challenge could be to rethink the role of the workforce in the digital supply network and how workers could be augmented by a range of robotics and cognitive technologies.

As noted, it can be difficult to envision precisely what those new roles would be. Some may be relatively simple to predict, such as training workers to use new, advanced technologies to augment and assist with familiar tasks. Others will likely be wholly new, taking greater advantage of the unique skills humans possess that machines do not. Indeed, as machines begin to take on more types of work that they can do more quickly and easily than humans— such as data-intensive computational tasks and analytics—human workers could similarly shift toward those areas where they hold the comparative advantage in skills.

Thus, while technology can contribute a significant proportion of the analytical "thinking" in many supply chain tasks, individuals may find themselves increasingly called upon to exercise their quintessentially human traits: communication, empathy, intuition, and the ability to contextualize, interpret, or question data.[2] Bringing human and machine strengths together in one team would allow workers to take on functions where humans can add value based on their own unique strengths, and thus possibly identify new opportunities for revenue growth,

innovation, and quality. Rather than robots replacing humans, the future of the DSN could involve human-machine teaming that creates new, distinct roles for human workers.

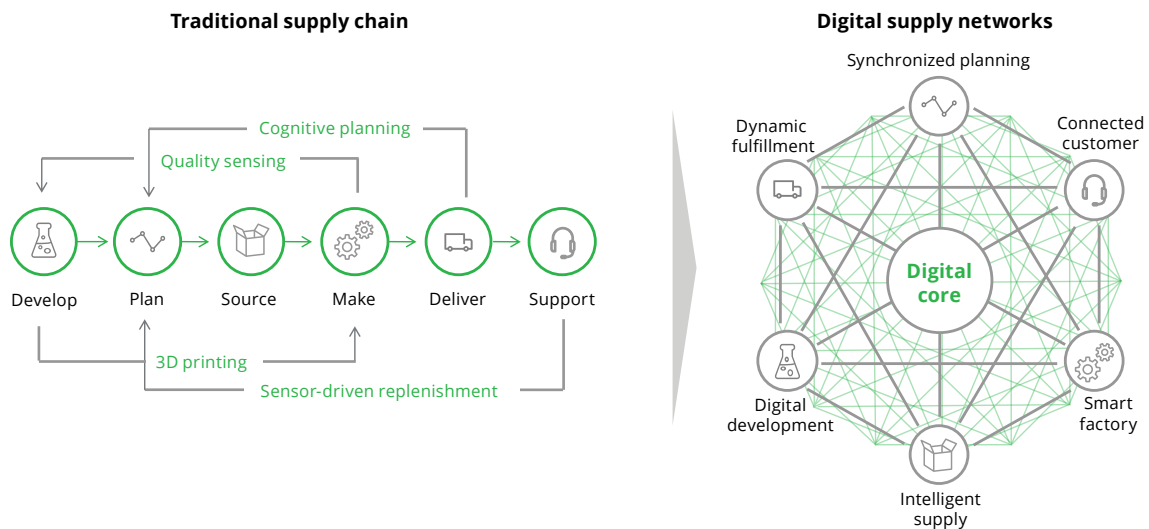This can seem like a challenge even in the best of times. But it also represents an opportunity for supply chain executives to uncover new areas of value within their organizations. In this article, we analyze the implications of how DSNs are likely to reshape the workforce, and provide a general framework for companies to consider as they prepare for this change, even in the midst of uncertainty.

A BRIEF LOOK AT THE DIGITAL SUPPLY NETWORK

In Deloitte's first publication of this series, *The rise of the digital supply network*,[3] we examined how supply chains traditionally are linear in nature, with a discrete progression of design, plan, source, make, and deliver. Today, however, many supply chains are transforming from a static sequence to a dynamic, interconnected system—a *digital supply network*—that can more readily incorporate ecosystem partners and evolve to a more optimal state over time. DSNs can integrate information from many different sources and locations to drive the physical act of production and distribution.[4]

In figure 1, the interconnected lattice of the new digital supply network model is visible, with digital at the core. There is potential for interactions between each node and every other point of the network, allowing for greater connectivity among areas that previously did not exist. In this model, communications are multidirectional, creating connectivity among traditionally unconnected links in the supply chain.

Figure 1. Shift from traditional supply chain to digital supply network

Traditional supply chain

Cognitive planning
Quality sensing

Develop → Plan → Source → Make → Deliver → Support

3D printing
Sensor-driven replenishment

Digital supply networks

Synchronized planning
Dynamic fulfillment
Connected customer
Digital core
Digital development
Smart factory
Intelligent supply

Source: Deloitte analysis.

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For more information, see *The rise of the digital supply network* on Deloitte Insights.

Greater interconnectivity could lead to new demands for the DSN workforce

HISTORICALLY, roles within the supply chain focused on periodically evaluating the flow of materials, then adjusting the parameters of static, disconnected assets to achieve the most efficient or effective result. This often meant relying on information from further up or down the chain, potentially leading to latency issues. Because it is always on and constantly connected, any DSN enables constant, near-real-time reconfiguration of supply chains. As such, a DSN is not static but can be configured to accommodate new products, unexpected events, and different technologies depending on the need. Some of the specific technological factors that enable this flexibility are the continuing commoditization of computing power, storage, and bandwidth; the Internet of Things; advanced analytics; cognitive computing; robotics; additive manufacturing; and autonomous systems.[5]

The impacts of a company's DSNs on its workforce can be profound: Interconnected, always-on, and agile systems mean that workers should be able to sort through mountains of data and make decisions faster than ever, all while avoiding information overload and paralysis.[6] Additionally, a connected community that is transparent from end to end means that workers should also be able to work beyond their immediate teams, with stakeholders throughout the supply network: suppliers, partners in different channels and geographical locations, and even customers. Further, they should be able to adapt to and develop a degree of fluency with the new technologies that power DSNs, outlined above.[7]

Supply chain executives appear to be recognizing the need for relationship-building in their workforce: In an August 2017 Deloitte survey, 45 percent of US supply chain executives noted increased interaction

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WHAT IS THE FUTURE OF WORK?

The future of work signifies the opportunity to evolve our workforces and workplaces. This evolution is being shaped by powerful forces, including:

- The growing adoption of artificial intelligence (AI) in the workplace

- The expansion of the workforce to include both on- and off-balance-sheet talent, often referred to as the *open talent continuum*

These shifts could lead us to reconsider the roles of individuals, organizations, and societies at work. From the individual nine-to-five workday to how entire industries function, work seems to be changing faster than ever. Big shifts threaten to potentially create massive societal and economic disruption unless we look seriously at making the future of work productive and rewarding for everyone. Visit our research collection to learn how technology could transform the workforce and the way people work in the future, while also showing how individuals, organizations, and societies can come together to thrive in the new realities at work.

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with suppliers as a talent-related change resulting from supply chain transformation; 36 percent noted increased customer interaction. Separately, nearly one-third pointed to versatility, flexibility, and adaptability—critical characteristics in an always-on DSN ecosystem—as the most important talent-related factors in determining the success of digital transformation initiatives.[8] Importantly, each of these qualities—interaction, ability to adapt quickly—are distinctly human facets, and ones that are not easily replicable by machines—at least not quite yet.
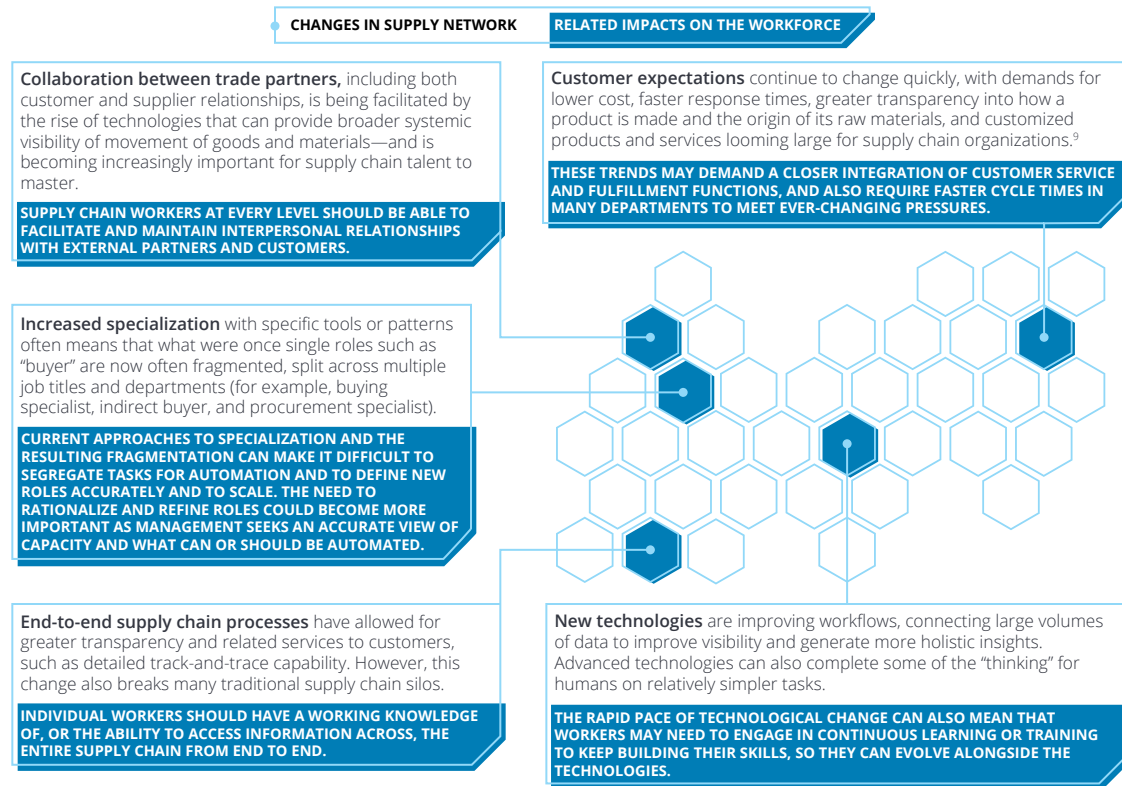
While these particular changes brought by DSNs may be readily apparent, others can be harder to identify. For example, as the linear supply chain continues to morph into many overlapping networks with connected customers, suppliers, and functions, new roles could emerge that require a broader knowledge of multiple disciplines. In other words, individual workers may require the same holistic view that characterizes the DSN itself.

The challenge lies in figuring out what these new roles may look like, as well as how current roles could evolve.

AT A GLANCE: KEY TALENT CONSIDERATIONS IN THE AGE OF THE DSN

As smart automation, coupled with techniques of cognitive and machine learning, are becoming more mainstream, most organizations are looking to find as many applications as possible to optimize their day-to-day operations. At the same time, other changes are taking place as well, shifting the expectations for the skills, training, and capabilities that could be most relevant for supply network roles. Figure 2 lists some of these changes.

Figure 2. How supply network changes affect the workforce

CHANGES IN SUPPLY NETWORK | RELATED IMPACTS ON THE WORKFORCE

Collaboration between trade partners, including both customer and supplier relationships, is being facilitated by the rise of technologies that can provide broader systemic visibility of movement of goods and materials—and is becoming increasingly important for supply chain talent to master.

SUPPLY CHAIN WORKERS AT EVERY LEVEL SHOULD BE ABLE TO FACILITATE AND MAINTAIN INTERPERSONAL RELATIONSHIPS WITH EXTERNAL PARTNERS AND CUSTOMERS.

Customer expectations continue to change quickly, with demands for lower cost, faster response times, greater transparency into how a product is made and the origin of its raw materials, and customized products and services looming large for supply chain organizations.[9]

THESE TRENDS MAY DEMAND A CLOSER INTEGRATION OF CUSTOMER SERVICE AND FULFILLMENT FUNCTIONS, AND ALSO REQUIRE FASTER CYCLE TIMES IN MANY DEPARTMENTS TO MEET EVER-CHANGING PRESSURES.

Increased specialization with specific tools or patterns often means that what were once single roles such as "buyer" are now often fragmented, split across multiple job titles and departments (for example, buying specialist, indirect buyer, and procurement specialist).

CURRENT APPROACHES TO SPECIALIZATION AND THE RESULTING FRAGMENTATION CAN MAKE IT DIFFICULT TO SEGREGATE TASKS FOR AUTOMATION AND TO DEFINE NEW ROLES ACCURATELY AND TO SCALE. THE NEED TO RATIONALIZE AND REFINE ROLES COULD BECOME MORE IMPORTANT AS MANAGEMENT SEEKS AN ACCURATE VIEW OF CAPACITY AND WHAT CAN OR SHOULD BE AUTOMATED.

End-to-end supply chain processes have allowed for greater transparency and related services to customers, such as detailed track-and-trace capability. However, this change also breaks many traditional supply chain silos.

INDIVIDUAL WORKERS SHOULD HAVE A WORKING KNOWLEDGE OF, OR THE ABILITY TO ACCESS INFORMATION ACROSS, THE ENTIRE SUPPLY CHAIN FROM END TO END.

New technologies are improving workflows, connecting large volumes of data to improve visibility and generate more holistic insights. Advanced technologies can also complete some of the "thinking" for humans on relatively simpler tasks.

THE RAPID PACE OF TECHNOLOGICAL CHANGE CAN ALSO MEAN THAT WORKERS MAY NEED TO ENGAGE IN CONTINUOUS LEARNING OR TRAINING TO KEEP BUILDING THEIR SKILLS, SO THEY CAN EVOLVE ALONGSIDE THE TECHNOLOGIES.

Source: Deloitte analysis.

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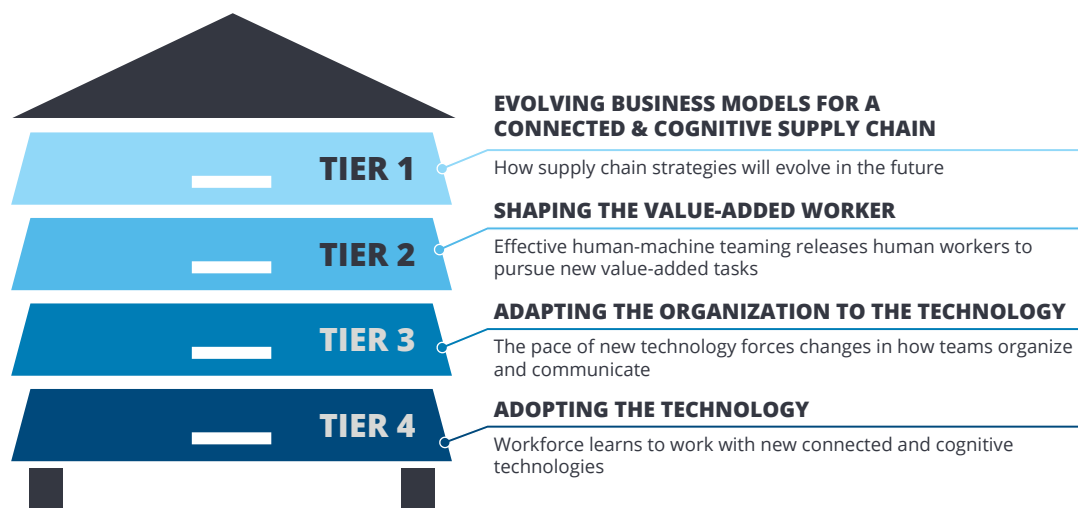
Evolving roles in the DSN

A four-tier perspective

EVEN more than technology, talent is perhaps the biggest barrier to realizing the promise of the DSN; 63 percent of supply chain executives note that hiring and retaining a skilled workforce is a top challenge.[10] But beyond simple hiring and retention, it is the relationship of that workforce to new technologies that can be the most important to success: 70 percent of supply chain executives say that their current workforce may lack the technology-related skills to succeed in the future.[11] The challenge remains to consider what types of skills will be needed in a DSN environment, how already-existing roles could evolve and transform, and where, precisely, those new, value-added roles will emerge within the DSN.

Categorizing the types of roles within the DSN and how they may shift can help leaders begin to conceptualize which roles might be replaced, which may be augmented, and which could be transformed into wholly new, value-creating areas (figure 3).

Technological change comprises the base of the pyramid, the driver of these larger trends. It is by implementing the right mix of technologies that companies can begin to do new things and operate in new ways. These new ways of doing business can then induce change up the tiers of the pyramid, from the organizational structure, to individual workers, and finally the core business model of the entire organization. It is important to note that the tiers do not connote varying degrees of value but rather each stage in a path of evolution that an organization may follow as it incorporates smart technologies into production. Further, the tiers are not mutually exclusive; organizations can experience changes in multiple tiers, and a mix of new roles from each level may be necessary to operate in a DSN environment.

Figure 3. A categorization for roles within the DSN

TIER 1 — EVOLVING BUSINESS MODELS FOR A CONNECTED & COGNITIVE SUPPLY CHAIN
How supply chain strategies will evolve in the future

TIER 2 — SHAPING THE VALUE-ADDED WORKER
Effective human-machine teaming releases human workers to pursue new value-added tasks

TIER 3 — ADAPTING THE ORGANIZATION TO THE TECHNOLOGY
The pace of new technology forces changes in how teams organize and communicate

TIER 4 — ADOPTING THE TECHNOLOGY
Workforce learns to work with new connected and cognitive technologies

Source: Deloitte analysis.

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Tier 4: Adopting the technology

Roles in this tier will likely remain largely the same, but as new technologies are introduced to increase efficiency, accuracy, and ability to adapt to new marketplace demands, workers may need new vocational skills to complete and manage tasks. The role of a maintenance technician, for example, may remain recognizable, but as the role increasingly incorporates the use of enhanced technologies such as augmented reality (AR) to make the process more efficient, technicians may need to learn how to use AR in the course of their job.[12] Likewise, roles in planning may remain much the same but may use technologies such as AI to build demand and supply models.

Beyond training on how to use the new technologies, the use of sophisticated tools such as AI may also require behavioral and mind-set changes among workers. Human planners would need to learn how to trust forecasts produced by analytical models and use them accordingly—a significant mind-set shift for some, which may take time to achieve.

Further, as organizations adopt new DSN-driven technologies, demand may actually *increase* for some types of current roles. Companies can address these shifts in demand either through internal training efforts or through focused external recruitment. For example, as cloud solutions become more common within DSNs, companies may find that they need more administrators than coders. Those companies may adjust their recruitment strategies accordingly to attract more administrators or, alternately, train current employees to move to roles that are now more in demand.

If greater internal training is the solution to a particular personnel shortfall, training strategies may need to shift as well. If a technology or business process is sufficiently new, a company likely does not have an existing training curriculum developed to instruct employees. Moreover, with the rapid pace of technological change, keeping training courses up to date can itself become a monumental task—but an opportunity as well. Indeed, the same technologies driving the need for training can also be used as *part of* training processes, offering interactive and engaging new learning modalities. For example, AR can provide immersive training environments that can be updated quickly as processes or tools change. AR is already being used to successfully train workers on everything from driving forklifts to flying aircraft.[13]

The use of new technologies may also facilitate a shift in how companies hire and leverage new workers with the desired skills. Traditionally, demand for a particular skill meant hiring an individual worker who possessed that capability and thus often limited employers by geography and other factors. A move to an alternative approach to the workforce can provide workers flexibility for nontraditional working arrangements such as working remotely or on a contract basis, and give companies a roster of competent talent that they can tap into on an as-needed basis.[14] Indeed, fully 37 percent of supply chain executives note they are hiring for full-time remote positions, while 27 percent point to part-time remote workers, and 27 percent to contract hires.[15]

TIER 4 IN PRACTICE

In 2015, French sports retailer Decathlon implemented real-time inventory tracking of merchandise at 400 stores.[16] The technology improved supply chain visibility, reduced stock shrinkage, and helped increase sales by 2.5 percent because more inventory was on hand and available.[17] Moreover, because the RFID readers were integrated into the existing checkout scanners, the system did not introduce significant changes in how workers do their job. Workers need to use a new piece of equipment to scan the RFID tag, but the core business process flow remains largely unchanged. In this way, a new technology application can bring new value to the business without significantly changing the workforce but rather augmenting already-existing roles.

Tier 3: Adapting the organization to the technology

The shift to a DSN—or multiple DSNs—also requires change in how an organization comes together to do work. The pace introduced by new technologies can require changes in how different units organize, communicate, and work together with other groups. These changes can even lead to an emphasis on entirely new roles more traditionally found in technology companies.

For example, the massive amounts of data created by DSNs can create problems for the handling and analysis of that data. First, DSNs begin by connecting the previously disconnected machines that manufacture and move physical goods through the supply network. Companies implementing DSNs may find ensuring connectivity, interoperability, and stability of legacy assets and new systems to be their first significant hurdles. As those challenges are overcome, asset connectivity can increase and begin to generate vast amounts of digital information about the physical world. Such vast troves of information are collected into "data lakes" and "data hubs." Often siloed, these data lakes and hubs can be challenging to make sense of and hard to connect together, and the resulting insights generated may be too insubstantial to prompt action.

The need to derive actionable insights from this data may drive the expansion of already-existing roles, as well as a new focus on more advanced technology jobs. Thus roles such as data scientists, computing experts, and robotics scientists will likely grow in importance as connecting, contextualizing, and acting upon data from multiple sources across the DSN become more central to operations.[18]

Further, the interconnected nature of DSNs often necessitates that teams increasingly work across traditional silos. In fact, as DSNs take hold, such integration is necessary not only internally but also across key stakeholders including suppliers and customers. It could even extend to other forms of outsourcing to third parties with relevant expertise. In this way, roles in tier 3 may shift to a more holistic consideration of production processes, requiring workers to have a deep understanding of how changes in one area, or node of the network, may impact performance in another.[19] This can foster teams with greater ability to exercise judgment and more complex problem-solving, systems, and technical skills.[20]

Recent research suggests that companies moving toward digital transformation have realized the importance of cross-training. A 2017 study by *MIT Sloan Management Review* and Deloitte on digital trends found that 71 percent of digitally maturing organizations are increasingly organized around cross-functional teams.[21] And while cross-functional teams are not new, digital technologies are enabling teams today to be increasingly dynamic—coming together to solve a problem, dissolving, forming, and reforming as needed to address new challenges as they arise—without requiring a new organizational chart.[22]

TIER 3 IN PRACTICE

Many brands are concerned about counterfeiting, as well as ensuring traceability throughout the supply chain as a point of differentiation for customers. In these cases, end-to-end visibility of the supply chain, from the provenance of each input or ingredient all the way to the store shelf, can be key to reassuring the customers that they are buying the genuine article and guaranteeing quality.[23] Doing so typically requires connecting not only the manufacturing plant but also external packaging plants, suppliers, shipping companies, distribution centers, and the retailers where the products are sold.

Connecting all of these stakeholders across the supply chain can create a huge volume of new types of available data that was previously unavailable to decision makers. Making sense of this data and, perhaps more importantly, enabling systems to act autonomously upon that information can become more central to every aspect of operations, from demand planning to inventory management. As a result, cross-functional teams that feature representation from every step of supply chain operations can help obtain a more holistic, end-to-end view of operations, adapt to and address any discrepancies, and recognize—and act on—any patterns that emerge.

Tier 2: Shaping the value-added worker

Organizations that can rise through tier 3 and adapt their structures and teams to new technology could experience the power of human-machine teaming, with human workers and technology working together to accomplish more than either could alone. Moreover, as technology frees human workers from one task, it can enable them to move to new tasks that create even more value. This could create perhaps the most challenging, significant hurdle for organizations: identifying those value-added tasks to which workers should move. Tier 2 involves understanding how jobs could change once they move past being supply-centric toward generating insights and building relationships.

As organizations implement DSNs, technology can take over more predictable, analytical tasks previously done by human workers: finding patterns, identifying and resolving production constraints in a supply plan, proactively linking situations with predicted needs, and creating the right order forms at the right time. This can allow humans to take on more value-added functions while machines would manage these more discrete and non-value-added tasks.

Specifically, roles in logistics, procurement, supply chain management, production planning, and demand planning may see the greatest evolution. As emphasis in the supply network moves from push to pull and from transactions to relationships, roles would similarly change from being task-oriented to end to end across the supply chain.[24] For example, DSN technologies can relieve a production planner from scheduling specific production runs, allowing that worker to focus on tailoring products and services to customers' specific needs. Similarly, procurement and logistics managers can focus more deeply on vendor and customer interactions, deepening relationships. Still other, unexpected roles can emerge. (See the sidebar "Tier 2 in practice.")

In these roles, human skills such as intuition, storytelling, and even "adversarial" roles to question the status quo or play devil's advocate with the data can become significantly more important. While machines can provide insights managers don't have to-day and can offer a series of probabilities about how the future might play out, they cannot predict the future with 100 percent accuracy or interpret what, precisely, the insights mean. Nor can they communicate their analyses in an interactive way. This is where human skills of communication and interpretation become relevant. While an algorithm can help optimize a process, a human can communicate the new plans to relevant stakeholders, translate complex technical concepts into an easily digestible format, answer questions, and build bonds through

TIER 2 IN PRACTICE

For manufacturers, keeping production lines running is crucial to financial success.[29] Therefore, maintaining supply chain stability amid unplanned disruptions is a critical strategic capability. For example, if a certain type of part takes 30 days for a supplier to produce and ship, the manufacturer can use sensors to detect inventory level and automatically reorder on a continuous, real-time basis, helping to reduce inventory in the supply chain. Not only can this system create a more robust, reliable supply chain, it can also free up workers who previously had to physically check parts levels and fill out the order form for the products.

Workers who used to manage this process can, in turn, move to new, value-added, relationship-centric roles. Rather than focusing on one vendor, they can sustain relationships with multiple suppliers, routing orders to a more diverse network of vendors depending upon capacity—creating more business for suppliers and optimizing efficiency. In this way, they can use the more "human" skills to better engage suppliers and customers with increased speed, accuracy, and individualized service.[30] These individuals can operate at a higher level; no longer focused purely on operational efficiency, they can instead look for opportunities to achieve broader business goals such as attracting recurring orders or new customers.

an increasingly complex and fragmented network of suppliers, customers, and partners. In other words, it is the job of the human to weave stories from the insights and provide an additional layer of value to the data—for example, sensitivities that may exist around one solution versus another, or various considerations around risk levels and material supply that may influence outcomes.

Indeed, supply chain research suggests that relationship-driven skills such as problem-solving, communication skills, ability to navigate ambiguous situations, leadership, and critical thinking may be even more crucial to performance than traditional job experience.[25] As machines are able to take over more rote tasks, social skills and cognitive abilities—very human traits that even the most advanced machines struggle to replicate—are increasingly seen in the workplace as being more valuable.[26]

Evidence suggests this shift may already be occurring. Using data from the UK Annual Survey of Hours and Earnings, Deloitte found that a 10 percent increase in social skills for workers results in a corresponding 10 percent increase in wages.[27] The implication is that the more *human* a skill is, the more "automation-proof" it becomes. Therefore, as the penetration of automation in an industry becomes more prevalent, such core social and cognitive skills actually become more highly valued and more greatly compensated. For example, customer and personal service knowledge, communication skills, critical thinking skills, and, quite simply, the ability to listen are among the most prized skills for the workforce.[28] In a DSN where connections between supply chain partners are the core function, such "soft" relationship skills are crucial as workers look to communicate value, find areas of mutual benefit, and get the job done.

However, the critical challenge is to identify where, specifically, those new, value-added roles will likely be created. Pinpointing precisely where new value can be created requires a deeper look at what creates value in a supply network. Ultimately, regardless of how advanced supply networks become, they are still driven, at some level, by human connections: between suppliers and consumers, factory and fulfillment, planning and development,

and departments within the organization. Workers can potentially create new value by finding and connecting previously disconnected stakeholders and individuals, and partnering more closely with machines who can do some of the "thinking" that enables these activities.[31] Therefore, workers displaced by automation can create more value if repositioned to other tasks that feature the highest number of stakeholders, where they can build the greatest number of relationships and have a more profound impact.

Tier 1: Evolving business models for a connected and cognitive supply chain

The final tier represents not an immediate hurdle to overcome, but rather a broader opportunity for organizations as they implement DSNs. A DSN and the technologies it entails typically necessitate a change to the business and the operating model. This, in turn, can drive process changes within the organization, which can lead to wholly new roles and tasks. Here, organizations can take the opportunities uncovered by the value-added, relationship-driven worker emerging in tier 2 to create new business opportunities built around relationships, new services, and deep insights into the nature of the business and its bonds to partners and customers. It is important to note, however, that each can inform and drive the other; changes to the business model can result in new roles, which can, in turn, create new opportunities for business model evolution.

Therefore, what tier 1 represents is a collaborative process of discovery where companies, employees, customers, and suppliers can all work together to evolve their relationships and try to uncover new opportunities. New technologies and new business models often result in changes in the workforce and can redefine the tasks workers are asked to do. But those changes, in turn, can help shape entirely new opportunities for the organization. To take advantage of these, an organization needs to be able to let go of some old ways of doing business and be nimble enough to seize those new opportunities.

TIER 1 IN PRACTICE

No one today can know the future with certainty. In fact, 65 percent of children entering primary school today will ultimately end up working in completely new job types that don't yet exist.[32] However, there are historical examples from which we can draw important parallels to just how DSNs may unearth some of those new opportunities.

Perhaps the canonical example of technology replacing labor in the modern world is the introduction of automated teller machines, now better known by their acronym, ATMs. While many feared that they would replace bank tellers altogether, by allowing each branch to operate with an average of 13 tellers rather than the typical 20, ATMs actually encouraged banks to redeploy the freed-up tellers to expand geographically.[33] For their part, many bank tellers also shifted the nature of their roles. Tellers could move on to higher-value, relationship-driven activities such as opening new accounts or issuing credit cards, while the machines handled the high-volume but lower-value task of dispensing cash and depositing checks. As a result, far from disappearing, the number of bank tellers in the United States has actually increased over the past four decades, from 250,000 to about 500,000.[34]

Writing the future

How to prepare for the future of work in DSNs

N o one can predict the future. However, with digital technologies in the DSN seeming to reshape much of the core of how workers do work, we can begin to understand the shape of that change. With examples from history and sound reasoning, companies can begin to prepare their structure and workforce for the demands an unknowable future can place upon them. As they begin to think about the ways in which their workforce would change with the DSN, organizations can consider the following steps:

Determine how technology can support your strategic goals. Technology can certainly be a powerful tool for improving processes and increasing efficiency. However, technology itself is not an end to aspire to; it is typically a tool for achieving other business goals. Therefore, rather than pursuing the latest technology merely because it exists and seems useful, consider your strategic goals and determine which technologies can best support those goals. Similarly, consider technology as a tool rather than a "magic-bullet" disruptor—just as technology supports solid business strategy, technology needs support too. New technology may require innovative new approaches to training or business processes, but it can ultimately strengthen your current operations, rather than upend them.

Craft a holistic plan to create a multidisciplinary workforce. As agility and cross-functional skills become increasingly important, teams of all backgrounds may come together to solve the complex challenges that arise in a DSN, then dissolve and move on to address new challenges. It is often important to focus on finding talent with the right skills and mind-set to work in this way. This may involve being open to the possibility of a more alternative workforce that includes a mix of full-time, part-time, remote, on-site, contract, and temporary workers—as well as more fluid teams that may form and reform as needed.

Remember what makes humans . . . human. While having the right technical skills is typically important for any supply chain role's success, cultivating the "soft skills" or the essentially enduring human skill sets, such as storytelling and communications, critical thinking, and knowledge of the customer's personality and preferences, can be equally important. These skills can enable people to share their technical expertise in a way that builds relationships and adds value. Companies can capitalize on the importance of soft skills by redeploying workers to areas where they can interact with the largest number of stakeholders. There, they can have the greatest impact and begin to identify opportunities for new products, services, and partnerships.[35] Finding workers with such skills may require looking outside of traditional sources for talent and expanding the recruitment scope to include nontechnical and liberal arts backgrounds.

Reexamine human capital strategy on your journey to a DSN—and encourage new ideas. The hallmark of a DSN is its flexibility and adaptability. As an integral part of a DSN's success, talent should be viewed in much the same way. Considering how future talent needs may change is a core strategic discussion for the entire C-suite. Similarly, encouraging that same flexible and adaptable mind-set in workers could help the entire organization react quickly to new opportunities.

This planning process can not only help companies navigate the unknowable change of the future but also points to a core tenet of the Fourth Industrial Revolution. As technology becomes more pervasive in all aspects of our work, humans and machines could increasingly play to their strengths. What this means for workers is that quintessentially human soft skills will likely only become more important; deploying humans for value-added tasks becomes a differentiator for companies; and talent, not technology, is what will likely determine a DSN's success. With those principles in mind, we can harness new technologies and potentially let DSNs write a new future of work.

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35. To find the value-added tasks in a supply chain, we need to take a step back and look at how supply chains create value in the first place. Ultimately, supply chains are about brokerage: They connect a company's demand for parts or logistics services with supply of those commodities. Brokerage creates value in connecting the previously disconnected. This allows the creation of new ideas and allows participants to detect and take advantage of previously unseen opportunities. (See Burt, *Brokerage and Closure*.) Or, in the case of supply chain, a company can find a truck in just the right place at the right time to move parts to an assembly plant to meet a deadline. Naturally, the more connections you can make and the more opportunities you have, the better. So the exact amount of that value created in a supply chain depends on what is being connected together. The connection of communicating groups such as those connected by brokerage are modeled on Metcalfe's Law, which states that the overall value of that network will increase by the square of the number of participants. Therefore, the more participants on either side, the more value is created by making the connection.

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