

WHITE PAPER

The future of manufacturing planning:

Top trends for the next decade

Abstract

As modern supply chain management enters its third generation, manufacturing planning processes – including network design, sales and operations planning, demand planning, master planning, inventory optimization, replenishment planning, factory planning, scheduling and order promising – will undergo massive changes over the next 10 years. A dramatically empowered customer, a rapidly changing workforce and an unprecedented amount of technological innovation will usher in an era of tremendous changes for both manufacturing and distribution companies. This white paper outlines the top 10 manufacturing planning trends that companies will need to address in order to be successful over the next decade and beyond.

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1 Introduction

Supply chain management has already experienced two significant revolutions. In 1975, enabled by mainframe computing, concepts such as manufacturing and distribution resource planning were widely adopted, ushering in new processes for effectively matching supply with demand. In 1995, a second revolution occurred when advances in microprocessor and memory technologies helped niche software providers emerge to solve complex optimization problems in supply chain management.

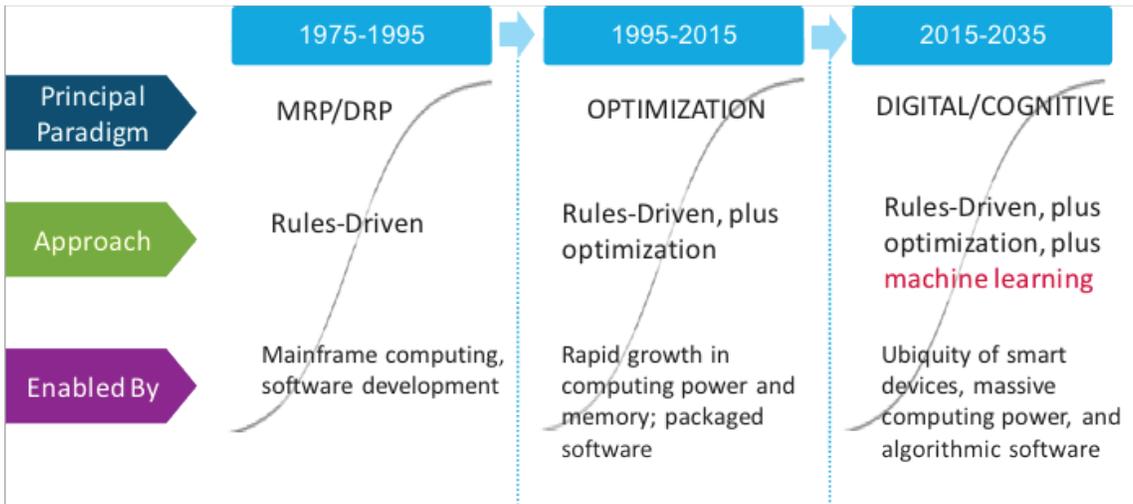
A third revolution in supply chain management is now upon us. Today, as digital devices become omnipresent and computing power continues to grow exponentially, machines and computer programs can now teach themselves to learn and grow – while processing massive amounts of new supply chain data in real time.

In this new world of ubiquitous smart devices and machine learning, customers emerge at the center of the universe more prominently than ever before – forcing the traditional business-to-consumer and business-to-business models to blur or work as

one. In addition, the supply chain itself continues to evolve rapidly into a complex network of entities across the globe, increasingly dynamic and fluid in nature. Digital supply chains are becoming a reality across almost every industry vertical. Increasingly, digital data will be coupled with digital smarts – intelligent software that learns, adapts and provides businesses with the ability to better serve customers.

Given this confluence of changes in customer power, business paradigms and enabling supply chain technologies, manufacturing planning is poised to undergo a radical transformation over the next 10 years. Foundational processes such as order promising, factory planning and scheduling will have to be reimaged.

This white paper identifies the top 10 trends for manufacturing and distribution supply chains over the next decade – and outlines how they will impact underlying manufacturing planning processes. Those companies that adapt to these changes best will emerge as winners.



2

Top trends for the next decade

The following trends will shape the future of manufacturing planning over the next 10 years:

- Supply chains will evolve and operate as **digitally connected grids**.
- **Profitability** will become the dominant theme driving supply chain processes.
- **Risk and opportunity management** will emerge as formal supply chain disciplines.
- Younger and more technology-savvy professionals will create a **transformation of the workforce**.
- **Big Data will become routine** thanks to the Internet of Things.
- There will be **no technology limitations** around memory, computing and processing.
- **Cognitive science and advanced machine learning** will realize huge advances.
- **Mobility** will be the default, as the notion of being tethered to desktops and laptops disappears.
- There will be a **convergence of supply chain processes and roles**.
- **On-demand consumption** of supply chain technology will become the norm.

Manufacturers and distributors that recognize these trends at an early stage, and implement intelligent strategies to capitalize on them, will realize a significant advantage over enterprises that stick to their old ways of doing business.

2.1

Supply chains as digitally connected grids

Supply chain networks, once defined and established, have primarily been regarded as relatively static in nature. Why? Because it's traditionally taken a large effort and a significant financial investment to change the flow of information and physical materials across different factories, warehouses, distribution centers and stores.

The buy-make-move-store-deliver objective of supply chains has long suggested a linear structure. Over the coming decade, however, linear supply chains will be replaced by sophisticated, cross-enterprise networks or grids surrounding the customer — with a laser focus on serving each customer segment profitably. With the explosion of any-place, any-time connectivity, consumer-centric perspectives and the speed of computing, the linear supply chain concept must evolve.

New technology will enable dramatic changes. For example, massive amounts of pertinent information will be available across the entire supply chain grid much more readily, with little to no latency. Multiple participants in the end-to-end ecosystem will come together and operate as a seamless virtual company serving the customer. The supply network will be dynamic and self-learning in nature, and it will be easier to configure the flow of information and materials more dynamically.



The optimal path to serve a customer will not be predetermined; instead, it will be computed dynamically based on real-time information in order to maximize service levels and profitability. The distinction between brick-and-mortar and online channels will begin to disappear, as physical and digital supply chain grids converge and operate as one.

2.1.1 Manufacturing planning will gain new flexibility

The implications for manufacturing planning will be significant. With the evolution to interconnected supply chain grids, networks will no longer operate as static structures, with annual or semi-annual reviews. In fact, all network parameters — including routes, resources, components, manufacturing schedules, distribution cycle times and yields — will be subject to change at any time. An optimal supply path for a given customer today may not be deemed the most appropriate choice tomorrow.

Network design and optimization will continue to grow in strategic and tactical importance. More and more companies will establish internal centers of excellence focused on fine-tuning their supply chain grids for operational excellence. Real-time collaboration across supply chain grid partners will

become essential, as supply chains will increasingly rely on real-time information for effective decision making. Decision-support technology will continue to evolve to foster real-time collaboration between end-to-end supply chain partners in this digitally connected grid.

2.2 Focus on profitability

Today, profitability is viewed as important — but in the next decade, it will become the driving factor in all manufacturing planning activities. Higher investor expectations will drive manufacturing and distribution companies toward an absolutely relentless pursuit of productivity across their supply chain planning and execution processes.

The language of supply chain professionals will increasingly mirror the language of their financial counterparts, and this transition will need to be managed carefully. Operational metrics such as on-time deliveries and days of inventory will need to be examined in conjunction with financial metrics that focus on overall business performance. The chief financial officer will become increasingly engaged with supply chain processes and collaborate much more closely with the chief supply chain officer — because that is where market share and margin battles will be won or lost. New strategic alliances will emerge across extended value networks, with a sharp focus on end-to-end profitability.

2.2.1 “Fit for purpose” supply chains will emerge

Manufacturing planning thinking will also undergo fundamental change. The financial supply chain — one that focuses on business revenues, margins, earnings per share and cash flow — will drive the physical supply chain over the next decade. The chief supply chain officer will promote a much greater focus on financial metrics.

In addition, as supply chains evolve to digitally connected grids, the dynamic reconfiguration of networks — with a focus on profitability — will become a dominant theme for manufacturing planning processes. “One size fits all” supply chain designs will be replaced with “fit for purpose” supply chains that serve the needs of different market segments uniquely at the right cost-to-serve, maximizing profitability while improving service levels.



Companies will need to focus on making the right decisions at the intersection of customer needs and product/service options — getting pricing, lead times and other offers just right to maximize profits in the short and long terms. Supply chain professionals will become fluent in the language of trade-offs and balancing service levels with the right cost-to-serve across different segments in order to drive profitability. Traditional sales and operations planning (S&OP) processes will mature into integrated business planning (IBP) processes that continually align different functions across the organization around the company's financial objectives. Corporate supply chain analysts will become comfortable with rapid scenario analyses that comprehend the impact of decisions on both operational and financial metrics.

Driving profitability will become paramount for supply chain practitioners at all levels — replacing today's limited focus on lowering costs and increasing service levels. That will require a fundamental change in the mindset of many supply chain professionals.

2.3

Strategic risk and opportunity management

Over the next decade, risk and opportunity management will assume much greater importance. With higher demand volatility on the one hand — and a dynamically changing supply chain grid on the other — manufacturing and distribution companies will proactively cultivate specialists who conduct supply chain risk and opportunity analysis on a continuous basis.

Demand- and supply-side scenarios will be evaluated on a probabilistic basis, instead of a deterministic one with fixed assumptions. Over the next 10 years, risk mitigation and upside opportunity planning will become a formal supply chain discipline, an integral part of supply chain management.

Thinking in terms of probabilities and associated ranges will require more advanced supply chain skillsets in the future. Risk and opportunity analyses will become a natural extension of the IBP process, with more structured, probability-based demand- and supply-side scenarios for different segments of the business. As companies deploy segmented supply chains to support diverse customer needs across different market segments, supply chain professionals will also need to craft tailored risk mitigation strategies for each of these segments.

Decision-support software will start incorporating machine learning concepts over the next decade, as computer programs become capable of detecting new patterns in data — and recommending new courses of action that maximize opportunity and minimize risk.

2.4

A workforce that embraces technology

As the general population grows younger across most regions of the world, a fundamental change is under way — one that we have not witnessed before. With Millennials entering the workforce, young supply chain professionals over the next decade will be much more technology-savvy than previous generations. Because Millennials have grown up with the Internet, mobile smart devices and easy-to-use apps, they will have much higher expectations from the advanced decision-support technology used in manufacturing planning processes. This generation will have an expectation that details should be automated, so they can stay focused on the bigger picture.

This technology-savvy workforce will dramatically change manufacturing planning for the better. Decision-support technology will be leveraged to drive supply chain decisions like never before. There will be a tremendous focus on exponentially complex, rapid decision making. Ease of use will become a baseline expectation from end users, and manufacturing planning decision-support systems will make the user experience a much higher priority.

In general, over the next decade information will need to be presented and consumed in a simple and engaging way, along the lines of a “game-ification” and social media like presentation layer — and must be accessible anywhere, anytime. Intuitive user workflows will trump sophisticated algorithms in a black box. Social media like constructs for issue resolution will become the norm for these users.

2.5

Big Data becomes business-as-usual

The Internet of Things, or IoT, refers to the network of physical objects connected through the Internet, as well as the intelligent communication that occurs between them. Factories today have already started embracing the concept of IoT on their journey toward becoming smarter and more efficient. This increasing adoption is possible because of the advent of low-cost sensors available in the market today, which is leading to connected, hyper-efficient production systems.

However, as this technology evolution continues over the coming decade, increasing efficiency will no longer be the driving force. Instead, improving effectiveness will be the highest priority. Across the manufacturing and distribution spectrum, the effective application of assets and resources will become the key differentiator.

Gartner estimates that 20.8 billion connected devices will be in use by 2020, up more than 400 percent from the usage in 2015.¹ This improved access to devices means that real-time information about demand and supply will be readily available at the lowest level of granularity. A product or material entering a manufacturing line will carry embedded information, designed to inform the assembly line about production processes to be configured in real time. Manufacturing lines will be able to get updated schedules and quality-related information immediately.

The traditional way of looking at material flow independent of information flow will be obsolete, as materials carry or produce their own information. This data will make rapidly reconfigurable manufacturing lines the norm. Moreover, such data will be available at lower and lower costs. The world will move from augmented sensors to embedded sensors, with embedded memory and computing power. This means there will be no additional cost of producing and consuming data.

As a result of these changes, effective data management will continue to grow in strategic importance for every manufacturing and distribution company. When the world moves from resource and asset utilization to asset maximization, effective data management will become a core differentiator. Embedded intelligent sensors will require the right data to flow along with the material, transforming areas like augmented reality to embedded reality. Enterprise risk management will evolve as a process because self-healing systems will start to form.

Extracting useful insights from massive amounts of data, rapidly, will become a critical requirement. Assets at granular levels will become intelligent enterprise agents. Data will be highly distributed, but the transfer of information will be filtered based on the level of usefulness across the spectrum of decisions made at different stages of the manufacturing and distribution lifecycle. As the right information transfers across decentralized agents (bots), the physical world of supply chain will become a cyber-physical universe.

2.5.1

Manufacturing planning will occur in real time

IoT is poised to transform manufacturing planning processes over the next 10 years because of the abundance of real-time data. Companies that successfully harness the data into intelligent information will emerge as winners.

Some traditional manufacturing planning processes, such as demand planning, will undergo radical change, as real-time consumption information becomes readily available with very little latency. Predictive analytics such as demand planning and forecasting will no longer be applied at the supply chain level, but at the hyper-connected network level. In fact, the analysis approach will move from predictive to prescriptive; systems will be capable of self-correcting real-time plans and automatically tracking execution processes with no time lag. Visibility across the supply chain will move to the lowest unit level at all times.



The concept of Industry 4.0 will be fully realized over the next decade, leading to a connected and continuous evolution of supply networks from product design to production control. The ultimate differentiator will be the fact that the material or resource will know its customer and how to get to the customer. Crowd sourcing of supply network resources could become a reality, which will require prescriptive analytics to provide plans and forecast at the virtual network level. Every physical device will become part of the overall end-to-end business process.

2.6

Unlimited memory, computing and processing power

The third revolution in supply chain has been triggered by massive progress in technology. The next decade will reflect exponential advances in both computing and storage devices — and computing power, memory and storage will continue to become less expensive.

Moving forward, best-in-class speed, capacity and cost will be key specifications for storage devices. For enterprise-class machines, distributed storage will be the norm, with many-to-many connections between storage nodes and processing nodes. The distinction between memory and deep storage will no longer exist. At the same time, computers will go through a dramatic shift along four dimensions: size, cost, intelligence and speed. Imagine carrying a device the size of a ring, which responds to human input while connected to a massive cloud that supports it.

As technology advances, large-scale supply chain problems will be solved with fewer simplifying assumptions, because the scale required to solve very large supply chain network problems will be readily available. Supply chain management software will have seamless access to the many-to-many compute-storage grids via simple and natural interfaces. Since these grids will be run by artificial intelligence and cognitive computing, the assumptions will be fewer — but the ingrained learning will be superior.

Companies will rely more heavily on technology to address complex supply chain problems. The ability to connect and solve multi-enterprise supply chain problems will be available both from the data infrastructure as well as the computational intelligence perspective. Seamless virtual computing environments, spanning multiple cluster boundaries and platform software, will make solving complex

problems easier. Enterprises and supply chain grids will solve all complex problems by leveraging deep learning algorithms and cost-effective supercomputing technologies.

An “always on” planning paradigm will start becoming a reality for supply chains. We have already seen shifts from batch-oriented planning to agile planning over the past few years. This lends itself to an always-on, responsive supply chain in the future. There are limitations with respect to the cost and speed of these systems today. However, with all the dramatic technological shifts under way, a move to a predictive, always-on paradigm — and eventually to a prescriptive, always-on paradigm — will be a reality in 10 years.

These systems will interact with end users only to share exceptions and recommend methods to resolve such exceptions. Systems will have all the data they need from a historical perspective and from a real-time perspective. They will constantly learn from sub-second level predictions and real-time feedback to auto-correct. The ability to run meta-heuristic algorithms inspired by biological systems at a massive scale, along with enormous always-on storage, will contribute significantly to eliminating the bull-whip effect across end-to-end supply chains.

End users will move seamlessly between aggregate and granular levels of planning. Real-time scenario analyses to guide decision making will become the norm. There will be near-zero cost to aggregate or disaggregate millions of rows and columns of data. Planning and forecasting will not be done at the item level or attribute level; instead, planning and forecasting will be possible at a combinatorial factor level. For example, imagine a forecast for an item at a location with a particular feature at a certain weather condition for customer A, and with a real-time social network feedback of X. Every attribute and every factor that affects that attribute will be available for planners, allowing them to give appropriate direction to their robotic assistant.

Information and insights will be automatically delivered to the user at blazing speeds, backed by super Big Data that the planner can leverage to compare and analyze scenarios in real time. This level of technology sophistication will only make users smarter about the micro-decisions they will be required to make. In fact, it is expected that technology systems will store all human planning behaviors, and start predicting the likelihood of human planning behavior for every micro-decision.

2.7

The rise of cognitive science and advanced machine learning

As limitations on memory, computing and storage disappear, cognitive science and advanced machine learning will assume a central role in supply chain management over the coming decade. Computer programs will teach themselves to learn and grow when exposed to new data.

In today's world, supply chain planning using optimization and predictive techniques has become commonplace. Exception-based management is widely prevalent, but systematic learning from these exceptions is not. Over the next 10 years, the interdisciplinary field of cognitive science will introduce a new era of double-loop learning and responses. Systems will learn from past exceptions and provide automatic corrections. The continuous flow of information at the machine and resource level — along with detailed data about consumer preferences — will support this capability.

Human perception, thinking and learning will be represented more accurately in computer systems. Machines will be able to emulate human behavior and thinking more readily via continuous deep learning about patterns, events and actions. Human supervision will be limited to managing these meta-

heuristic and algorithmic agents. These computer agents will use cognition inspired by biological and robotic systems. There will be various types of information, including video data, driving pattern recognition.

Machines will be able to offer the next level of advanced decision support to human supply chain professionals. Autonomous agents clustered to form colonies will become the new assistants to humans, providing advanced decision science and support. These agents will continue to reveal new insights across the value chain, thereby assisting intelligent human decisions. As the intelligent agents learn more from these decisions, they become smarter. They refine their insights to automate and, in some cases, eliminate the need for human intervention.

2.7.1

Manufacturing planning will become more exact

Such advances in cognitive science and machine learning will impact manufacturing planning in many different ways over the next decade. Both unstructured and binary data will be leveraged much more extensively to guide supply chain processes and create greater precision. There are vast amounts of unstructured and binary data — such as video and audio data — available today, but this is the most unused information in supply chain management. While exact statistics are not available on a global basis, many researchers and data scientists estimate that 60 percent of enterprise data today is unstructured or binary in nature.

Both forms of data contain useful information about human psychology and decision behaviors. Advancement in neural networks — including, but not limited to, brain imaging and neurobiological methods — will allow us to understand the hidden linguistic structure of this information, as well as comprehend the cognitive structure useful for learning and decision making. Imagine looking at a continuous stream of video data and having the ability to detect defective work-in-process goods. Not only would this capability help in detecting and predicting inefficiencies in complex manufacturing processes, but it would also help course correct at the earliest possible time.

Attribute-based forecasting for new products will incorporate cross-attribute learning from historical data, leading to more accurate forecasts. Predicting new product sales has always been more art than



science, and attribute-based forecasting has been a challenge for many years. However, as Big Data becomes part of the basic infrastructure and every attribute of every product is available, cross-product learning will become the norm for new product predictions. Discovering the DNA of the product — which includes not just product attributes but also customer, location and production attributes — will create a competitive advantage for companies that adopt this approach.

Identifying detailed consumer behavior patterns will drive more granular segmentation strategies. And, as intelligent agents (software bots and robots) become ubiquitous, information about consumers will help achieve mass personalization, creating a strategic differentiator. Across the supply grid, new segmentation strategies will be matched to consumer-centric production. Proactive insights and learning from customer interactions will help the new generation of supply chain planners and decision makers have the right information at all times, driving more effective and profitable decisions.

Multi-loop learning systems will also become the core of all supply network processes and software. Agent-based systems, composed of powerful bots, will constantly learn and provide information about exceptions in a distributed fashion. This knowledge will lead to self-learning supply chains, which will provide guidance to users on critical decisions. Eventually, self-learning will elevate to the level of self-healing supply chains.

2.8

Mobility becomes the norm

According to Gartner Research, the share of traditional PCs (desk-based and notebook) as a percentage of the total devices market in 2015 had declined 10.3 percent, and is expected to decline further to 8.6 percent by the end of 2018. Moreover, the same research predicted that by the end of 2016, 82 percent of all mobile phones will be smartphones.² As supply chains evolve to digitally connected grids, mobility will become even more essential for supply chain professionals. End users will expect information and decision-making capabilities to be at their fingertips or sight lines, regardless of where they are physically. Real-time information should be deliverable to pertinent parties anywhere, anytime. More and more supply chain apps with structured workflows will become available to help end users. Mobile platforms will allow two-way interaction,

driving faster decisions and higher productivity. In this always-on, hyper-connected world, mobile workforces will increase in number — and will require easy access to real-time supply chain planning and execution information.

This proliferation of mobile devices, and the corresponding growth in network infrastructure, will continue to drive mobility as the first choice for future decision-support solutions in supply chain management. Manufacturing planning processes will be always-on and always accessible on mobile formats. Users' experience expectations will increase; they will be looking for an experience similar to leading-edge consumer apps.

In addition, social collaboration within and across the enterprise will become commonplace, powered by mobile devices. Emerging collaboration technologies and smartphone apps will continue to drive higher productivity and efficiencies for the technology-savvy, mobile workforce over the next 10 years.

2.9

The convergence of processes and roles

Driven by a relentless focus on profitability, supply chain organizations are going to be asked to do more with less in the future. However, the supply chain eco-system within each company will be broader, and business users will have a better understanding of the bigger end-to-end picture, without being buried in details.



As supply chain related information becomes more transparent and visible to all participants, functional silos will be lowered, leading to a convergence of supply chain processes. Inefficient processes will be exposed and eliminated. Business users will be expected to know more about the big picture, and end-to-end processes, as everyone focuses on driving profitability. This will lead to a convergence of supply chain roles.

There will be a significant impact on manufacturing planning processes as a result of this process and role convergence. The traditional boundaries between IBP, master planning and factory planning will become weaker. In some industry verticals, traditional supply chain processes will merge. For instance, demand planning will become an integral part of IBP, which in turn will evolve from a sequential to a simultaneous, continuous process. As another example, it may no longer be advantageous for an organization to conduct S&OP on a monthly cadence. This type of executive process will need to take place on a real-time, as-needed basis, gathering information from key stakeholders — often including roles outside traditional “supply chain planning” functions — as needed. With silos lowered and information readily visible in real time, end users will need to traverse across different business processes smoothly and maintain continuity of experience.

2.10

On-demand technology consumption

As supply chains evolve to digitally connected grids and the pace of innovation accelerates, consumption of supply chain technology will also evolve rapidly over the next 10 years, driven by the need to incorporate new innovations faster. On-demand consumption models, including software-as-a-service (SaaS) options, will continue to gain momentum as manufacturing and distribution companies look to drive improved alignment between benefits and costs.

Internal IT departments will continue to be an integral part of the deployment process, but less bandwidth will be required to implement supply chain technology. Best-of-breed supply chain solution providers will continue to provide innovations to the market faster, leveraging leading cloud platforms to drive next-generation solutions.

Over the next decade, as supply chain professionals transition to an always-on world, all manufacturing planning processes will be provided as SaaS offerings, using next-generation technology. SaaS-based delivery of capabilities will help drive more efficiency in manufacturing processes; this would be significantly harder to achieve with homegrown and other high-barrier-to-entry solutions. Software upgrades will no longer become one-time, carefully scheduled events; instead, continuous software upgrades will become the norm and will be seamless for the end user. Companies will look for a clean upgrade path to move from their current supply chain systems to next-generation systems, without any disruption to their businesses. Software solution providers will strive to create “sticky” offerings with a much higher emphasis on the user experience in order to keep their customers motivated, engaged and satisfied.

Supply chain technology will become indispensable in the digitally connected world of tomorrow, but its delivery and consumption will be simplified dramatically. That is good news for supply chain professionals who will be looking to maximize customer service and returns on investment in an increasingly complex environment.

3

Bringing it all together

The next 10 years are poised to bring seismic shifts in the supply chains of manufacturing and distribution companies. These shifts will result from unprecedented changes in the relative power of consumers and customers, massive advances in technology, the evolution of digitally connected supply chain grids, and a younger, technology-savvy workforce. Such changes will continue to disrupt the status quo, even as companies strive to enable profitable growth in a hyper-connected and intensely competitive business landscape. Understanding these changes and trends is essential to ensuring future success.

Thanks to the acceleration of our knowledge- and information-based economy, end consumers and customers have never been in a more powerful position. That power is only going to increase over the next 10 years, as more and more pertinent information becomes available in real time. Customers and end consumers will become even more selective and demanding as more and more choices become available to them.

IoT will present huge opportunities for customers and suppliers alike over the next 10 years. Structurally, the supply chains of tomorrow will operate as digitally connected grids, with massive amounts of data available to extended value chain partners on a real-time basis. Transparency into real-time information across all supply chain roles will lower functional silos and reduce latency. Some of the traditional manufacturing planning processes and roles will converge, as supply chain professionals adopt end-to-end scenario analysis as a regular part of their jobs.

The confluence of dramatic advances in cognitive science, machine learning and a younger, more technologically savvy supply chain workforce presents a huge opportunity for step changes in supply chain management. With little limitation on memory and computing power, future decision making will rely heavily on advanced technology that automates heavy lifting, evaluates different scenarios and presents options for future courses of action. Risk and opportunity management will become a formal supply chain discipline. On-demand consumption of supply chain software technology will become the norm, with mobile technology playing a critical role.

Companies that are able to stay ahead of the curve on these end-customer, structural and technology trends will find themselves in positions of significant competitive advantage over the next 10 years.

1. Gartner press release, "[Gartner Says 6.4 Billion Connected "Things" Will Be in Use in 2016, Up 30 Percent From 2015](#)," November 10, 2015.
2. Gartner press release, "[Worldwide Device Shipments to Grow 1.9 Percent in 2016, While End-User Spending to Decline for the First Time](#)," January 20, 2016.

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On the brink of a revolution

We are at a unique juncture in business history, right at the onset of the third revolution in supply chain management. We are fortunate to witness unprecedented and fundamental changes that will shape the future of manufacturing planning over the next decade.

Manufacturing and distribution companies that internalize these supply chain trends — and embrace the associated challenges as strategic opportunities — will develop a sizeable competitive advantage in the market. In today's hyper-competitive landscape, supply chains will continue to drive profitable growth and competitive advantage, even more so over the next 10 years as these trends take shape.

To prepare for the upcoming revolution, all manufacturing and distribution companies need to examine their technology systems, business processes, human resources and top-level supply chain roadmaps and ask the question: Are we ready? If the answer is no, it's time to take steps to anticipate and respond to the trends discussed in this white paper.

