

Predicts 2017: Supply Chain Trends and Innovations

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Robotics, corporate social responsibility and outsourcing will force supply chain organizations to embrace new practices and capabilities. Chief supply chain officers should factor these trends and innovations into their strategic planning.

Key Findings

- Increased use and deployment of robots in companies will give rise to the chief robotics officer (CRO) executive role.
- According to the International Energy Agency, the logistics sector accounts for one-quarter of the world's CO2 emissions. Working with logistics partners on corporate social responsibility (CSR) initiatives reduces costs and enhances the reputation of brand owners.
- As outsourcing increases, CSCOs and their leadership teams will be challenged to coordinate activities across a complex partner ecosystem. As a result, supply chain organizations will need to develop complex multipartner relationship management expertise.

Recommendations

- Work with CROs to define and implement a life cycle approach for managing large-scale robotic environments.
- Incorporate a CSR-focused section to your third-party logistics provider (3PL) selection criteria. Incorporate a set of CSR questions in all future RFIs and invitations to tender (ITTs) as well as any subsequent 3PL contracts and master service agreements (MSAs).
- Invest in leadership-building programs that will cultivate the skill sets required to simultaneously lead and orchestrate multiple internal and external parties.

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Strategic Planning Assumption(s)

By 2020, 10% of large enterprises in supply-chain-dependent industries will have established a chief robotics officer (CRO) role.

By 2021, 30% of large enterprises will make CSR as important as price and service in their selection of a 3PL partner.

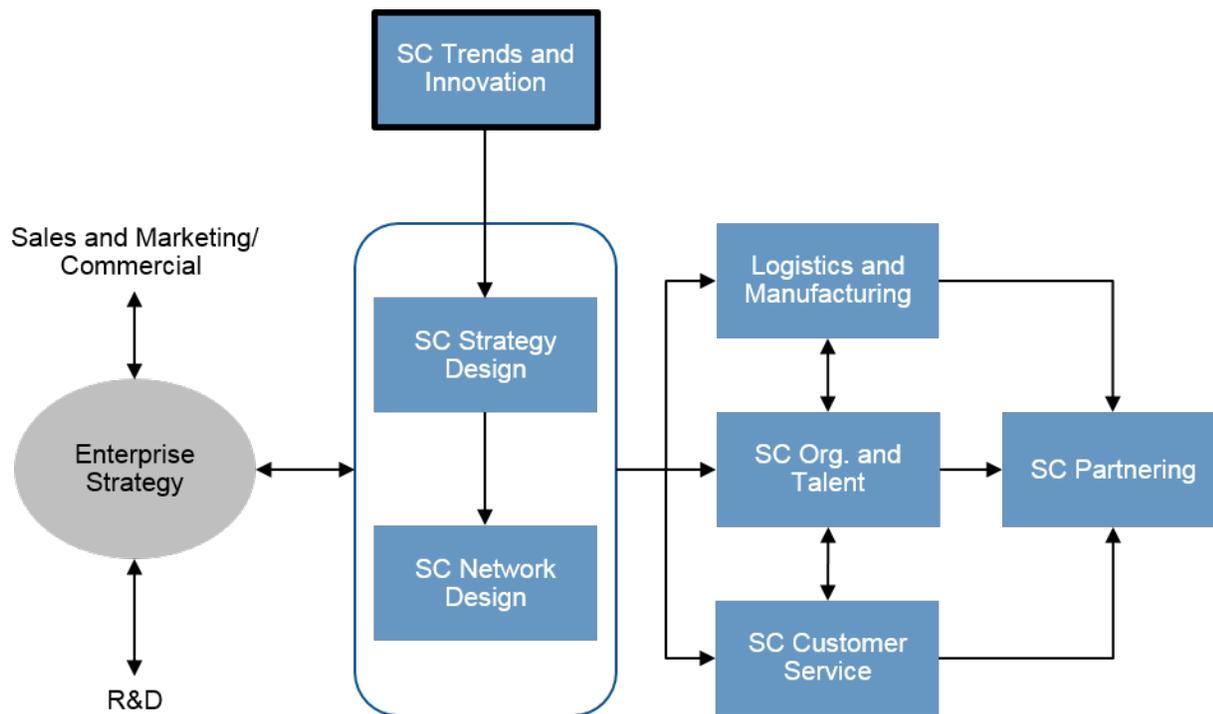
By 2021, 10% of companies that currently outsource one or more supply chain functions will have evolved to outsource all executable supply chain functions and related business processes.

Analysis

What You Need to Know

CSCOs need to consider supply chain trends and innovations when developing or updating supply chain strategies. Trends and innovations influence strategy, which impacts the design and operation of the supply chain (see Figure 1).

Figure 1. Supply Chain Trends and Innovations Impact Strategy and Operations



Source: Gartner (November 2016)

The predictions in this research impact the following Gartner Key Initiatives:

- Design and Align the Supply Chain Strategy
- Supply Chain Organization and Talent
- Supply Chain Network Design to Optimize Costs and Service
- Logistics Strategy, Performance and Network Optimization
- Improve Customer Service and Fulfillment in Supply Chain
- Supply Chain Partnering to Improve Costs and Innovation

Supply chain organizational designs and talent strategies must change. Robots and machines are getting smarter and more flexible, leading to operational and managerial challenges for supply chain leaders. A blending of human and robotic workers will require redefining collaboration models, skill profiles and role descriptions.

Supply chain network designs will need to include robotic capabilities into network modeling and optimization. The capabilities, capacities and constraints of robots will need to be captured during decisions about where to locate and operate manufacturing and distribution sites.

Increased use of outsourcing across multiple supply chain and operational areas will force supply chain leaders to monitor the network and redesign or reconfigure nodes based on changing demand, supply, cost or risk.

Increased importance of CSR coupled with broader and more complex partner ecosystems will force supply chain leaders responsible for supply chain partners — such as 3PLs, contract manufacturers, contract design organizations and suppliers — to adopt new practices and build new capabilities. The net effect will be a change to how supply chain organizations source and manage third parties. Even more fundamentally, as some companies approach nearly 100% outsourced processes, the very definition of what a business is will be challenged. Apparel and footwear organizations lead this charge today where many function as brand facades with minimal, if any, operational functions conducted internally.

Strategic Planning Assumptions

Strategic Planning Assumption: By 2020, 10% of large enterprises in supply-chain-dependent industries will have established a chief robotics officer (CRO) role.

Analysis by: C. Dwight Klappich

Key Findings:

With continued growth in demand, use and deployment of smart machines and robots, companies must elevate the management of these increasingly critical assets from simply the operational engineering role to a more strategic C-level management level. CEOs believe it is inevitable that more decisions will be made by thinking machines. As a result, companies will face growing competitive pressures to deploy this emerging technology to automate processes. In Gartner's "2016 What the Best of the Best Do Differently Survey," 149 respondents from midsize and large organizations were surveyed by phone in April 2016. We found that 13% of leading companies are making robotics and smart machines technology one of their top three investment areas. Furthermore, the percentage making robotics and smart machines technology one of their top three investment areas is even higher for fast followers (21%) and mainstream companies (26%). For companies with extensive use of robotics across manufacturing and logistics, we see companies creating a CRO position that will blend engineering, IT and human capital management skills to develop the management structure to oversee all facets of the robotic life cycle.

Market Implications:

People-centric management practices have evolved over centuries, and, in large part, organizations and individual managers are reasonably competent at managing people. Companies have developed strong capabilities to hire, motivate, discipline, encourage, advance and reward humans. However, while robots are rapidly growing in use, development of effective principles, processes and disciplines for managing automated workers are nascent at best. Without question, at the operational technology (OT) level in companies with large-scale robotic deployments, we see that companies have developed some of the necessary competencies to effectively manage robots. However, we believe companies must begin to make a paradigm shift from purely bottom-up (engineering) operational thinking to top-down (C-level) strategic thinking about the role and

management of robots. For example, take the role of governance. From an OT bottom-up perspective, governance centers around safety, reliability and interoperability. From a top-down view, governance could include addressing issues around labor relations, brand protection, government mandates or capital investments. The more strategic the implications of automation, the more important the need for C-level oversight and control.

Companies will increasingly rely on smart machines and robots replacing functions previously performed by humans. One of the first steps will be to recognize the need for new management techniques; the second will be developing an organization's structure that recognizes the differing role for robots. In the future, for example, leaders will not be able to sit down with individuals to develop individual development plans that will drive improved performance. They will have to determine what is needed to design and build this improved performance into their robotic workforce — thus the emergence of the CRO role. The great manager of the future will likely have equal measures of engineering, logic and problem-solving, and IT skills, and will rely less on softer skills, like coaching or cajoling.

Recommendations:

CROs will be responsible for and must support the following life cycle steps for effectively managing large-scale robotic environments:

- **Imagine** — Provide the vision for how robots/smart machines will drive business value.
- **Design** — Translate the vision into an actionable and realistic design of the operating environment.
- **Build** — Oversee the build out of the automated operating environment.
- **Integrate** — Work through integration scenarios where robots work with robots, as well as where robots work side by side and collaborate with humans in an operational environment.
- **Operate** — Implement the management processes and controls to effectively operate the automation.
- **Maintain** — Foster the processes and governance to ensure the health of the automated environment.
- **Upgrade** — Direct the planning and execution of periodic upgrades.
- **Replace** — Develop strategies and processes for managing end of life and replacement of the automated environment.

Related Research:

"Hype Cycle for Supply Chain Execution Technologies, 2016"

"Smart Machines Will Offer Major Opportunities, Cause Cultural Disruption and Radically Change Manufacturing Operations"

Strategic Planning Assumption: By 2021, 30% of large enterprises will make CSR as important as price and service in their selection of a 3PL partner.

Analysis by: David Gonzalez

Key Findings:

Corporate social responsibility is something that has traditionally been the concern of other functions within the end-to-end supply chain, such as sourcing, procurement and manufacturing. Increasingly, CSR is being driven further into logistics and, for most logistics leaders, is fast becoming a must-have rather than a nice-to-have when selecting a third-party logistics partner.

CSR can be interpreted in a number of different ways. When it comes to logistics, the interpretation is often anchored around the environmental impacts caused by physical transportation. According to the International Energy Agency, the logistics sector accounts for one-quarter of the world's CO2 emissions.

For logistics leaders, that makes the fuel efficiency achieved by their transport partners a dual benefit. Spending less on fuel has positive consequences. It reduces costs and also demonstrates to the broader business as well as the outside world that the logistics function is taking steps to care for the environment.

Certain companies are further along in their supply chain and logistics-focused CSR efforts. For the first time, Gartner's Global Supply Chain Top 25 incorporated a CSR score. On average, the highest-ranked companies scored higher in terms of commitment, transparency and performance in running ethical and sustainable supply chains.

The 3PL community has recognized the growing importance of CSR to logistics leaders in their selection process for a 3PL partner, and the majority of global 3PL leaders have developed their own environmental protection programs.

For example, DHL through its GoGreen initiative¹ has embedded environmental responsibility into its business operations. DHL believes that this has increased its customers' preference for the brand and strengthened its market position.

In addition to the environmental impact measures, 3PLs are incorporating policies that embrace broader CSR aspects, such as anti-slavery legislation, combating illegal migration, promoting the living wage and good working conditions, and investment in education and local communities. Many organizations are including policies in their service contracts that compel their 3PL partners to act upon their CSR policies and demonstrate results — not just talk about them.

Competitive pricing and excellent service levels will continue to be key drivers in a company's selection of a 3PL partner. Additionally, as 3PLs are becoming increasingly aware of CSR, it will be an equally important factor to winning new business.

Market Implications:

Well-financed 3PLs such as DHL can, with relative ease, develop and maintain their own CSR programs. Midsize and smaller 3PLs may not have the resources to evolve CSR to the same level as their larger peers. Joint private enterprise and government-agency-sponsored and developed initiatives, such as the SmartWay program² from the U.S. Environmental Protection Agency, are being warmly welcomed by the 3PL community. SmartWay offers a common framework and mechanism for shippers and transport companies to measure and benchmark the sustainability and efficiency performance of their freight transportation activity.

Increasingly, companies seeking to appoint a freight transportation service provider in North America are stipulating that all transport partners must be certified SmartWay members. The certification proves to the potential customer that the service provider has processes, measures and reporting capabilities that capture and detail their carbon emissions. Another condition of the certification is that the organization is focused on and actively engages in projects and initiatives to reduce its own and its customers' carbon emissions.

There will be more jointly sponsored private enterprise and government initiatives like SmartWay that will drive the importance of CSR and facilitate the implementation of robust CSR policies across the 3PL community.

Recommendations:

- Investigate transport and logistics industry associations and government agencies that have established frameworks and guidelines on CSR. This may save time and effort in developing your own.
- Engage your 3PL partners to learn what CSR policies they have in place, and how they ensure and audit compliance across their entire network.
- Incorporate a CSR-focused section to your 3PL selection criteria. Incorporate a set of CSR questions in all future RFIs, ITTs and policies to govern CSR in your service contracts.

Related Research:

"A Maturity Model for Managing Corporate Social Responsibility in the End-to-End Supply Chain"

"Supply Chain Brief: Act Now on Sustainable Development Goals to Identify Strategic Risks and Opportunities"

"Introducing a Score for CSR and Sustainability Performance to the Gartner Supply Chain Top 25"

Strategic Planning Assumption: By 2021, 10% of companies that currently outsource one or more supply chain functions will have evolved to outsource all executable supply chain functions and related business processes.

Analysis by: Courtney Rogerson

Key Findings:

Historically, companies have adopted outsourcing models to fill internal gaps in expertise, generate cost savings, reduce assets/financial exposure, and/or increase focus on other core competencies.

Research into supply chain outsourcing markets shows an increase in the number of supply chain business processes and functions being outsourced. Some of these include the outsourcing of manufacturing, logistics and fulfillment, planning, customer service, order-to-cash process, procurement, reverse logistics, and network design and analysis.

In Gartner's 2016 CSCO study, the following industries highlighted a supply chain talent shortage as a top three risk to their organization over the next three years: consumer product manufacturers, healthcare providers, aerospace and defense/auto/industrial manufacturers, and chemical manufacturers.

Outsourcing providers, such as third-party logistics and external/contract manufacturers, continue to expand their service offerings, leaving them well-positioned for increased visibility and capability in serving the end-to-end (E2E) supply chain.

Market Implications:

Extrapolating on the trends above, we will begin to see an increase in the number of pure "brand companies" over the next four to five years. As these companies decrease the number of supply chain functions and processes inside their core wheelhouse, they will continue to expand their use of outsourcing across the entire supply chain.

These brand companies may determine that R&D is the only core competency that should remain in-house (such as some high-tech startups, and biotech, pharma and fabless semiconductor firms, and other technology firms with proprietary knowledge) or determine that there is no need for even R&D to remain core (e.g., some fast food, e-commerce and retail/apparel firms). Large brand companies adopting this model will become even greater influencers across social, economic, political and environmental issues.

Consequently, even more complex ecosystems will develop, requiring very robust orchestration capabilities, and real-time data and visibility platforms. The existence of an advanced multienterprise network platform, complete end-to-end supply chain visibility and data security, in conjunction with trust and transparency, will be extremely critical to the success of these complex networks as we advance further into the digital era (see "Predicts 2017: Global Logistics Are Embracing New Business Models to Remain Competitively Relevant"). Supply chain outsourcing providers are actively investing in these capabilities now, making them well-positioned to support the supply chains of the future.

This kind of outsourcing business model will force companies to reconsider their traditional definitions of business and supply chain strategies, and modify their approach to provider relationship management. Supply chain management roles will move to embody that of musical conductors. The roles of CSCO and other supply chain functional management (planning, procurement, manufacturing and logistics) will shape, set and regulate supply chain goals and

objectives; govern strategic network design; and become increasingly analytical and decision based in nature. Responsibilities will include high-level oversight, with a critical task being to select and maneuver the complex network of key outsourcing partners, internal stakeholders and end consumers to yield competitive advantage. These roles will review day-to-day reports to ensure consistency with goals and objectives, and will be responsible for designing and implementing robust relationship management and performance review programs (including, but not limited to, review of cost, quality and risk assessment/mitigation).

As a result, some companies will have implemented additional metrics to measure these more qualitative aspects of the relationship. These include topics such as sharing, listening, finding synergies and relationship building. Joint-value initiatives will steer the strategies of these dynamic, pulsing ecosystems, and companies will have to focus more on business outcomes as a measurement of success.

Recommendations:

- Continuously evaluate what you consider core against corporate strategy and evolving market conditions.
- Develop more vigorous outsourcing provider management programs. These should address and include measurement capability of cost, performance, risk/security (data and physical), continuous improvement, and engagement and collaboration.
- Implement outcome-based contractual agreements where possible. These models aim to align the goals of both the organization and the provider.
- Invest in leadership-building programs that will cultivate the skill sets required to simultaneously lead and orchestrate multiple internal and external parties.

Related Research:

"Toolkit: Supply Chain Leaders Outsourcing MSA — Article 21 — Relationship Management/Vendor Sponsorship"

"Supply Chain Outsourcing Guidance for CSCOs"

"How to Structure Supply Chain Outsourcing Master Service Agreements"

"The Four Futures of the CSCO Role"

A Look Back

In response to your requests, we are taking a look back at some key predictions from previous years.

This topic area is too new to have both on-target and missed predictions. We are highlighting one predict that we consider a "miss" because our prediction was too conservative.

Missed: 2015 Prediction — Gartner forecasts that the number of devices in the Internet of Things (IoT) community will reach 20.8 billion units in 2020. Of that total, nearly two-thirds of those devices (65%) will be proven "hackable" by 2019 (see "Forecast: Internet of Things — Endpoints and Associated Services, Worldwide, 2015").

Although the IoT market continues to evolve, Gartner may have been too conservative when estimating how many products will be hackable by 2019. With the rise in cyberattacks, including a massive event in September 2016 that crippled hundreds of websites, it is likely that the universe of hackable products may already be approaching 65%, well ahead of initial expectations.

The attacks on domain name system provider Dyn were the latest in a series of distributed denial of service (DDoS) attacks, where target sites are flooded by junk traffic until they crash. Dyn traced the attack to "tens of millions" of Internet Protocol addresses, or items like webcams, baby monitors and other Wi-Fi-enabled things that are among the nearly 20 billion items connected to the Internet of Things. In response, Hangzhou Xiongmai Technology Co. recalled its web cameras that were identified as some of the devices involved in the hack. IoT hardware from several manufacturers was compromised during the attack.

The attack reinforces the vast potential security woes associated with the Internet of Things, which allows devices to talk to each other and enables applications such as predictive maintenance and extensive data analytics so brands can learn more about customer buying habits. Gartner forecasts that the number of devices in the Internet of Things community will reach 20.8 billion units in 2020.

Given that so many IoT devices are not secure, it is imperative for CSCOs to collaborate more closely with CIOs, CTOs and chief information security officers (CISOs), as well as all engineering functions, on digital security. In industrial and healthcare companies, this risk has been the catalyst for aggressively pursuing a supply-chain-centric digital business agenda, rather than the top-line opportunities driving so much digital marketing spending at the front of the consumer and high-tech value chains.

In the case of the cyberattacks in September, the result was not catastrophic. Imagine, however, the potential calamity of a cyberattack that targets medical devices or implants, where an actor could hack the tissue-cutting code via the hospital's own network, posing a huge risk to patient safety. Similarly, an actor could take over web-based security cameras, aiding in illegal theft activities.

As cars and trucks become connected to the internet and driverless tests expand, the automotive industry is responding to cyberattacks. In October, the National Highway Traffic Safety Administration (NHTSA) released guidelines to protect vehicles from cyberattacks and unauthorized access. Even in sectors where cyber-risk scenarios are not as grim, there is still a need to actively participate in the technology discussions required to close the digital business knowledge gap. Technology and technology risk need to be integrated considerations in business and supply chain strategy. This has not been the norm in most industries, and is difficult to achieve given organizational structures and cost pressures.

In high-performing, mature supply chain organizations, technology and technology-related risk are integrated strategy elements. The CSCO is technology-savvy, as is the extended leadership team, and IT and engineering colleagues are not held at arm's length. Operations, technology and

leadership expertise are often pulled into a supply chain solution's lead role that reports directly to the CSCO, rather than into IT. Many of these companies have also upgraded supply chain roles to reflect stronger technical and analytical skills and experience.

Given the stakes, security remains a growing concern for supply chain leaders. In Gartner's 2014 and 2016 CSCO studies, cybersecurity was ranked the top risk. In the two years between the studies, perceived risk became noticeably greater when looking ahead — 28% to 48% for short-term risk, and 29% to 41% for long-term risk.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"A Maturity Model for Managing Corporate Social Responsibility in the End-to-End Supply Chain"

"Supply Chain Brief: Act Now on Sustainable Development Goals to Identify Strategic Risks and Opportunities"

Evidence

The 2016 Gartner CSCO study was conducted to find out and understand the business priorities of supply chain leaders — what drives their supply chain strategies, improvement goals, effective practices and organizational design. The research was conducted using a mixed methodology of both online and CATI from November through December 2015 among 261 respondents in North America, Western Europe and Asia/Pacific. Respondents were required to have direct leadership in two or more supply chain functional areas.

The survey was developed collaboratively by a team of Gartner analysts who follow supply chain, and was reviewed, tested and administered by Gartner's Research Data Analytics team.

¹ "GoGreen Program," Deutsche Post DHL.

² "Learn About SmartWay," EPA.

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