The Future Supply Chain

The challenges and technologies shaping the future supply chain

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In this global and digital age, markets, operating demands and conditions can change in an instant. Companies must be able to pivot and adapt to stay ahead of the competition. A company's supply chain is critical to remaining agile and competitive.

"It is nearly impossible to predict the future, but by examining current trends, we can prepare for the unknown."

Supply Chain 2025: Planning Today for Tomorrow
Gartner

Having insight into the trends and forces impacting global markets and business operations goes a long way in helping a supply chain, and a business, stay competitive.

Chief Supply Chain Officers should dedicate considerable time and thought to what the future holds – for the economy, their industry, their company – and how supply chain best practices and technologies can help shape it.

According to an Olin School of Business study, 40 percent of Fortune 500 will be extinct in 10 years.

Four Key Supply Chain Challenges

The Chief Supply Chain Officers and the supply chain organizations at Fortune 1000 and Global 2000 companies are confronted with significant demands and challenges which can dramatically impact business performance.

Of course, the primary challenge is ensuring the availability, quality and costs of supply. The supply chain organization must first ensure it can meet customer demand.

The brand must also be safeguarded – by ensuring suppliers and product components live up to the values and expectations of customers (e.g., environmentally and socially conscious). And in an ever-growing number of businesses, where innovation can mean the difference between success and failure, supply chain organizations are being called upon to tap their suppliers as a source of innovation.

These demands and objectives place significant pressure on supply chain organizations.

The IBM Institute for Business Value (IBV) conducted a global study with more than 400 Chief Supply Chain Officers (CSCO) and senior supply chain executives from Fortune 1000 and Global 2000 companies to go deeper and determine what the specific key challenges are for global supply chain organizations.

According to the IBM IBV CSCO study, the top five supply chain challenges are:

1. **Visibility**—Flooded with more information than ever, supply chain organizations struggle with information management, and providing clear, comprehensive visibility into their supply chain. Seventy percent of CSCOs see this as a significant challenge.

2. **Risk**—Risk management ranks remarkably high on the supply chain agenda as well, with organizations struggling to predict and mitigate events in a proactive or timely manner. Eighty-seven percent of CSCOs consider proactive risk management critical, yet only 36 percent say they are equipped to adequately manage it.

3. **Cost Containment**—Though cost containment is a core objective and traditional area of strength for supply chain organizations, changes in markets and the operational environment make this a continual challenge. Fifty-six percent of CSCOs see it as a significant challenge.

4. **Customer Intimacy**—Despite demand-driven mantras, companies are better connected to their suppliers than their customers. Fifty-five percent of CSCOs see customer intimacy as a significant challenge.

The Key Challenge: Visibility and Data Management
According to IBM Institute for Business Value research, the greatest hurdle in achieving the supply chain organization's objectives is a lack of visibility and transparency. It is the root of many of the top business challenges.

- 84 percent of CSCOs say a lack of end-to-end supply chain visibility is their top challenge.
- 80 percent of data is dark and unstructured, posing a risk to the business.
- 77 percent of CSCOs say big data analytics is both disruptive and critically important to the business.

The nagging pain points for establishing greater visibility usually stem from data and information management challenges. Organizations grapple with an overwhelming amount of data which is accessed via a myriad of different systems.

Most organizations lack transparency into critical links in supply chain processes – as well as the visibility needed to better predict and prevent disruptions and inventory imbalance. And this largely stems from an inability to corral and make sense of an overwhelming amount of data, scattered across different processes, sources and systems.

Five Key Technology Trends

Determining the future of supply chain management can be partially understood by examining the management challenges discussed above. The other critical piece of the puzzle is understanding the arc of technology development; how technology evolution will influence and impact the management of these business challenges.

So, what are the technologies companies will use to address these challenges – and make their supply chain more intelligent, interconnected and agile?

A group of IBM supply chain and technology leaders recently explored this issue – and outlined key technology trends in a paper entitled, Top Supply Chain Trends for 2017. The paper examines the technologies being leveraged and evolving in the space.

Five key technology tends influencing global supply chain organizations were identified:

1. **IoT:** The increasing availability of IoT Data.

2. **Big Data:** Increasing supply chain visibility and value via big data.

3. **Analytics:** Harnessing cognitive analytics.

4. **Blockchain:** The growing momentum and adoption for blockchain in supply chain.

4. **Cognitive:** Advancing visibility and risk management through cognitive technologies.

Download a copy of Top Supply Chain Trends for 2017.

Perhaps the most impactful technology trend for business, not just supply chain, over the next decade will be artificial intelligence.

Artificial intelligence technologies are no longer the realm of science fiction – nor the sole domain of computer scientists and techies. According to TechRepublic (ZDNet), technology and economics are aligning in a way that puts us at "a tipping point after which the use of artificial intelligence will become commonplace."

Artificial intelligence, also known as cognitive computing or cognitive technology, is increasingly being applied by forward-looking companies across almost every industry – from healthcare and finance to manufacturing and consumer products.

In a recent edition of Wired magazine, an analyst from Tech Evaluation Centers wrote, "it seems we are approaching another turning point in technology …. Machine learning, along with many other disciplines within the field of artificial intelligence and cognitive systems, are gaining popularity, and it may in the not so distant future have a colossal impact."

The IT research firm IDC estimates that by 2020, 50 percent of all business analytics software will incorporate cognitive computing functionality.   The non-profit Pew Research Center, which conducted in-depth research on the current state of AI wrote: "By 2025, artificial intelligence will be built into the algorithmic architecture of countless functions of business and communication, increasing relevance, reducing noise, increasing efficiency and reducing risk across everything from finding information to making transactions."

Three Defining Characteristics of the future Supply Chain

So how will cognitive technologies impact supply chain management?

Cognitive technologies present a future where supply chain systems can think – making supply chains more intelligent, resilient and predictive.

1.   Comprehensive, Real-Time Visibility

Cognitive technologies will be used to centralize supply chain data and intelligence across all internal and external sources so organizations will have 'one version of the truth.'   This will allow global supply chain organizations to work on the same page, across departments, and make decisions based on data they trust.

Cognitive technologies will allow organizations to:

–   Establish a centralized view of supply chain data and intelligence across all internal and external sources;
–   Integrate and interpret unstructured data and content feeds
–   Leverage dashboards, analytics and data visualization to provide insights and empower staff to act;
–   Gain visibility into the 'gaps' between the digital and physical supply chain; and
–   Instantly access personalized dashboards, deep analytics and robust visualization of data.

2.   Predictive, Proactive Mitigation of Disruptions

Cognitive technologies will be used to create the comprehensive visibility needed to gain true insight into supply chain disruptions and risks. With this new level of understanding, supply chain professionals will be able to predict these kind of outlier events and will be able to put mitigation plans in place before they occur. The technology will also foster collaboration, both among internal supply chain staff and with suppliers. This will help all parties work together more effectively and resolve issues, such as disputes, quickly.

Cognitive technologies will allow organizations to:

–   automate risk and event monitoring to the fullest extent possible;
–   Provide staff with the capabilities to intelligently monitor and assess supply chain threats, disruptions and risks;
–   Develop internal 'playbooks' to provide guidance on how to react to an event based on experience; and
–   Foster collaboration between internal and supplier groups to speed exception and dispute resolution.

3.   Elevating the Supply Chain Professional

Aside from these specific applications, cognitive technologies will provide business value by significantly improving collaboration and decision making:

Cognitive technology promises to boost collaboration by:

–   Building collaboration automatically into internal and external processes and event resolution;
–   Establishing virtual 'Resolution Rooms' that intelligently bring together internal and/or external teams;
–   Automatically alerting internal staff and/or suppliers to disruptive events and risks; and
–   Instantly leveraging cognitive capabilities to provide insights and possible prescriptive actions.

Cognitive technology promises to boost confidence in decision making by:

–   Elevating the value supply chain professionals provide their organizations and extending their knowledge and experience;
–   Supporting and validating decision-making; and
–   Fostering innovation, finding new ways of operating, providing new insights and uncovering new opportunities.

Conclusion

The business and technology landscape is rapidly evolving, but the trend lines are clear: cognitive and other disruptive technologies will play a defining role shaping the supply chain of the future. Although the road ahead promises to be more disruptive and competitive, the future supply chain holds the promise, through the application of cognitive technologies, to become more transparent and agile.

Businesses with an intelligent and agile supply chain will be well prepared to adapt to rapidly changing conditions, securing a core competitive advantage that can lead to or extend market leadership.

Footnotes

1. IDC FutureScape: Worldwide Big Data
and Analytics 2016 Predictions

2. Pew Research Center: Predictions for
the State of AI and Robotics in 2025

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