



IDC ANALYST CONNECTION



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Understanding Today's "Thinking" Supply Chain

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The digital transformation (DX) of the supply chain has brought new innovative technologies to the manufacturing industry. As new and significant capabilities emerge, the best-in-class supply chain must be able to quickly consume and disseminate those most relevant to contribute to pressing corporate initiatives. Moving to a digitally enabled "thinking" supply chain must be about readiness, return, and relevance.

The following questions were posed by Esri to Simon Ellis, program vice president for Supply Chain Strategies at IDC Manufacturing Insights, on behalf of Esri's customers.

Q. We have been chasing visibility in the supply chain for years, with varying degrees of success. What is different now?

A. There is an old saying in the manufacturing industry that "you cannot improve what you don't measure." At IDC, we'd also add that "you cannot respond to what you do not see." The ability to have insight into what's happening in the supply chain and then to take appropriate action based on those insights is a critical element of the modern supply chain. One senior supply chain executive recently opined, "It is no longer acceptable to say that we didn't know — we must know; the data is there." Indeed, many supply chain professionals are wrestling with the notion of expanding "intelligence" to include the things we know, the things we don't know, and the things that we don't know that we don't know. What all this means is that visibility becomes a critical enabler for the effective, modern supply chain — and not just retroactive visibility (what has happened) but also real-time, live visibility (what is happening now).

Supply chains have been chasing visibility for years. Early on it became apparent that full, enterprisewide visibility was not something that could be enabled in one fell swoop; rather, it would happen incrementally as a result of prioritized efforts. This observation has been largely borne out in practice. For example, many supply chains have focused on shipment and inventory visibility, through projects to improve their "track and trace" capabilities, and the broader process of determining the path of a particular product. The reality is that the bar has been raised over the past year or two, and there is clearly unprecedented pressure to know where a product is and what path it is on, to know this information "right now," and to be able to predict what's going to happen where, next, and why. There's no patience for downtime. The digital transformation of the supply chain has brought new technologies and capabilities that enable things such as end-to-end visibility. The exponential growth of data availability and access means that more insights are available to the supply chain. Organizations that are best positioned to leverage those insights will benefit disproportionately versus those that do not or cannot. The central challenge is to be able to

take the technologies that are available now, and those that are coming, and assemble them into cooperative systems that can be implemented internally and externally to enable visualization, alerting, and predictability.

Q. We talk a lot about disruption in the supply chain. What does this really mean, and how will the supply chain have to change to reach the necessary new capabilities that will be critical?

A. DX in the supply chain is about the customer (or consumer); that's the world we live in. As companies use digital competencies in the supply chain to drive better products and services, those that do not will find themselves increasingly uncompetitive. Clearly these changes will occur at a different pace in different industries, but companies that compete in segments ripe for digital disruption had best get started. While digitally enabling the supply chain is critical, it is useful to remind us all why this is true. It's partly about reconciling reality from aspiration and accepting that aspiration today is reality tomorrow. Not all things digital must be necessarily disruptive. We would view digital transformation as a continuum ranging from things that are evolutionary (we can do it now for efficiency or effectiveness) to things that are revolutionary (we can do it in the future as a part of reimagining our supply chain). Moving to a digitally enabled "thinking" supply chain must be about readiness, return, and relevance. Indeed, DX represents a fundamental shift from traditional reactions to disruption to this digitally aware, proactive, and premeditative thinking supply chain. It also means putting into place complementary systems that are built to enable seamless and real-time collaboration with foundational data aggregation, analysis, and visualization capabilities.

Early-mover advantage is likely to be significant in digital transformation, so investments in technology, platforms, or other infrastructure must be made in the context of readiness and preparedness. As new and significant capabilities emerge, the best-in-class supply chain must be able to quickly consume and disseminate those new capabilities. But these investments must also provide a return, in terms of being able to improve upon how things are done, thus driving efficiency or effectiveness, or enabling new approaches, potentially to capture new markets more quickly than before. It's about mitigating or reducing disruption certainly, but it is also about providing insights for a faster return on innovation. Lastly, there is the issue of relevance: For example, how do investments today relate to the fundamental role of the business, or how do they facilitate new business models?

Q. Data is a data problem, the Internet of Things (IoT) is a data problem, and even machine learning can be viewed as a data problem. Will companies that figure out how to manage and analyze their data better have a competitive advantage over those that do not?

A. In focus groups that we have conducted with supply chain leaders on the topic of IoT, the discussion almost always ends up revolving around data and analytics. While managing a network of sensors will be a challenge in and of itself, the reality is that sensors are simply another source of data — a potentially *huge* source, but just a source. We have talked about an analytics gap in the supply chain, principally the inability for most companies' analytics capabilities to keep pace with the growth in data. This gap will only get worse and is at the core of the comprehensive analytics capability that will need to both scale with data and offer new ways of extracting insights and business value.

We have also talked about expanding supply chain intelligence beyond the things we know and the things we don't know to include the things that we don't know that we don't know. Whether it's a potential disruption, product quality problem, or fast-emerging market opportunity, the supply chains that enable proactive steps or quick reaction will contribute to market success. Yet, the overwhelming amount of data, both inside and outside the enterprise, means having

the ability to be advised on what's critical in real time. This means knowing what is failing, or about to fail, rather than being continuously apprised of everything all the time. The ability to quickly and comprehensively turn data into insight is critical — insights that seamlessly blend internal and external data (i.e., extreme weather, political unrest, environmental events) with clarity into the most urgent supply chain risks and opportunities. The importance of a reliable source of accurate analytical information should not be underestimated; however, it cannot be an afterthought from the ERP core. Indeed, it must be an integral part of the core to be truly adaptive and to turn analytics into actions for the supply chain.

The reality is that data is increasingly thought of as digital capital, and it will inform better decisions and, ultimately, enhanced business performance as supply chains shift to digital enablement. Data sources are myriad, from traditional ERP-generated data to location/geospatial data and from social media data and sensor/IoT data.

Q. What is the role of a digital twin in the supply chain, and what are the foundational requirements to make it a reality?

A. The term digital twin was coined by the Defense Advanced Research Projects Agency (DARPA) decades ago. However, it wasn't until the past 24 months as 3rd Platform technologies (cloud, mobile, big data/analytics, social business) and innovation accelerators such as IoT were adopted that the concept of applying visualization and simulation more broadly to the operations of products, assets, or business processes became more possible and widespread. Digital twins, or virtual representations, can be used for ideation and early-stage design of products and assets, for the monitoring of business processes, or as "early warning" systems for potential disruptions in the physical world. As the supply chain evolves to a digitally enabled thinking supply chain, real-time digital awareness can inform the best physical response.

Digitization in the form of a digital twin is not the same as digitalization of the supply chain. In the latter, digital technologies are embedded into the supply chain to drive both efficiency and effectiveness, and while scenario modeling may well be part of that ongoing operation, it does not eliminate the need for the digital "analog" of the supply chain to provide a separate sandbox for assessment and next best action. The power of the digital twin of the supply chain revolves around representing the physical supply chain elements in a real-time digital perspective that can be viewed, interrogated, and analyzed — from a single point within the supply network or as broad as a global operating picture.

The underlying capabilities are still evolving, but the best digital twin implementations have full, real-time visibility into the supply chain, with robust analytics and what-if scenario planning functionality.

Q. How is the enterprise role of the supply chain changing? Are companies thinking of the supply chain as a strategic contributor to achieve growth and innovation?

A. I have often joked about the traditional perspective of the supply chain in the C-suite as akin to an offensive lineman in the NFL — the only time his number is called is when he commits a penalty. This has largely been true for the supply chain — it is recognized only for failures, not for successes. Yet, leading manufacturers increasingly view the supply chain as a critical function in enabling the delivery of new capabilities or supporting new business models that contribute to an overall global growth strategy; successful companies have "graduated" the supply chain from a cost center and afterthought to an engaged seat at the table. Indeed, the evolution of the chief supply chain officer from the CFO's direct report to a board member is a clear demonstration that forward-leaning companies recognize the importance of the supply chain as a critical contributor to achieving a successful market and growth strategy.

If companies are going to achieve their goals for growth and innovation, they can no longer plan new products, services, or business model changes without a full understanding of the up-front implications from the global supply and distribution network. If the fulfillment of new market demand is not met, growth cannot be achieved.

Ultimately, manufacturers require a supply chain that is evolving in terms of strategic thinking and in how it leverages new and modern technology and business processes to achieve transformation. In a supply chain survey that IDC conducted in 2016, 75% of the respondents stated that the supply chain was a critical function for their company to achieve its strategic goals for sales and profits.

ABOUT THIS ANALYST

As a program vice president, Simon Ellis is responsible for providing research, analysis, and guidance on key business and IT issues for manufacturers. He currently leads the Supply Chain Strategies practices at IDC Manufacturing Insights, one of IDC's industry research companies that address the current market gap by providing fact-based research and analysis on best practices and the use of information technology to assist clients in improving their capabilities in critical process areas. Within the Supply Chain practice, Mr. Ellis is directly responsible for the research in the Supply Chain Planning Strategies practice while also managing the Supply Chain Execution Strategies practice. These supply chain practices specialize in advising clients on supply chain network design, S&OP, global sourcing (profitable proximity and low-cost sourcing), transportation, logistics, and more. He also supports IDC Retail Insights IT Strategies practices.

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