

## Industry 4.0 Supply Chain Management: Part 2

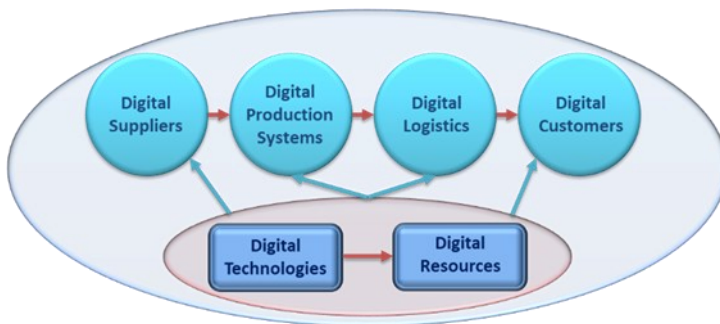
Volume 2 Issue 9, September 2023

In the previous newsletter, we initiated a discussion on how the adoption of Industry 4.0 impacts the supply chain in your company. We defined Digital Supply Chain (DSC) and explored the top benefits of the digitalization of supply chain processes. We will continue the discussion on DSC in this newsletter.

### The Six Dimensions of DSC

A Digital Supply Chain (DSC), also called SCM 4.0 or smart supply chain, delivers a smart, value-driven, and efficient process to generate new forms of revenue and business value for organizations. With DSC, firms can leverage new approaches with novel technological and analytical methods. DSC is about the way supply chain processes are managed with a wide variety of innovative technologies, for example, autonomous robotics, cloud computing, and internet of things (IoT), among others.

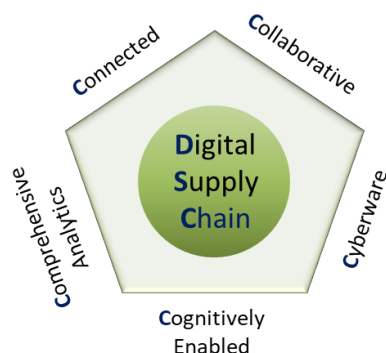
Digital Supply Chains (DSC) can be considered as the culmination of six dimensions as shown in the following figure.



Typically, all supply chains consist of activities that include procurement of raw materials, conversion of those materials into final products, and delivery of those products to customers either directly or after storage. DSC is about the way supply chain processes are managed with a wide variety of innovative technologies. Here, digital technologies and resources are employed by digital suppliers and digital production systems to produce smart products and distributed to digital customers using digital logistics. These six dimensions form and define the concept of a digital supply chain as the value creation in the digital supply chain is based on digital transformation.

### The Five Concepts (Five Cs) of DSC

The International Data Corporation Research, Inc., has defined the digital supply chain in the context of five “Cs” including connected, collaborative, cyberware, cognitively enabled, and possessed of comprehensive analytics<sup>1</sup>. These five dimensions of DSC are shown below.



### Definitions

#### Structured data

Data that is typically stored in a relational database consisting of numbers and text. SQL (Structured Query Language) is used to extract information from databases. Typical examples are names, credit card numbers, Microsoft Excel files, and text files.

#### Unstructured data

Data that is not structured and stored in its native format. Typical examples are media, social media activity, video files, audio files, imagery, and various other file formats. Businesses not using unstructured data are missing out on a lot of valuable business intelligence.

#### Semi-structured data

Data is a type of structured data that does not fit into the formal structure of a relational database but employs identifiable markers to separate different elements and thus enables search. Typical examples are smartphone photos which has tagged times, locations, and other structured, identifiable information. Semi-structured data formats include JSON, CSV, and XML file types.

#### Dark data

Data not visible, or not yet visible, to an organization. The information assets that are collected but generally not used are the dark data of an organization. Dark data may contain information relevant to compliance requirements or risk management. Typical examples are customer survey data, emails, text messages, and social media posts. Analyzing this data can help identify potential compliance issues or assess risks associated with certain business practices.

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**Connected**

The crux of DSC is accurate and current data and the capability for the processes and products to access that data in real time as and when needed. Therefore, the integration of data sources and automation of processes across internal and external supply chain functions and processes. The connected DSC must be able to access structured, semi-structured, and unstructured data from IoT, ERP, social media, and any other business to business (B2B) integration.

**Collaborative**

Collaboration with suppliers is critical in supply chain networks. This is because most of the value creation in supply chains is due to suppliers. Therefore, improving collaboration with suppliers is important. In digital supply chains, it is important to establish collaborative networks by the use of cloud-based networks with suppliers. Using blockchain is another way to establish trust as this technology integrates multiple sources of data to provide transparency and efficiency into supply chain transactions.

**Cyberware**

Cyber security is important when companies increasingly use digital means in their processes. It becomes very critical for companies to thwart cyber intrusions and cyber-attacks. DSC is not free of these cybercrimes and companies must employ extra precautions as far as cybersecurity is concerned.

**Cognitively Enabled**

Automation and self-learning of supply chains enables the cognitive aspects of DSC. AI is used profusely to modernize the digital supply chains to make decisions and take the best actions possible. This type of cognitive enablement uses the data to create a positive impact on digital supply chains.

**Comprehensive**

Data analytics in real time reduces the latency that is found in traditional supply chains. It provides comprehensive insights that are needed to make the best decisions in the operational features of digital supply chains.

**Gaps in Traditional Supply Chains**

Digital supply chains use cloud-based networks with data analytics capabilities and IoT implementations. Utilization of sensor fusion and AI help the digital supply chains to make smart factories of the future. However, there are a number of gaps to achieve digital transformation of traditional supply chains. The two major gaps are created by analytics and knowledge.

**Analytics gap**

First of all, companies in general generate a tremendous quantity of data. However, most of that data is never used. Furthermore, in most cases, data on the companies from various public and private sources is precious and sparsely used unless the companies choose to do data analytics. Basic algorithms and artificial intelligence models can be applied on structured, semi-structured, unstructured, and dark data. The abundant, available data can be fully leveraged to do analysis and detect business and operational trends and insights in the supply chain network. The trends and insights into the digital supply chain networks will be of immense value and beneficial to all the supply chain participants in the network.

**Knowledge gap**

As supply chain participants focus on cost reduction, a bigger problem arises! This is the knowledge gap left by knowledgeable workers in the supply chain. As these workers leave, so does their knowledge. Moreover, the knowledge of retiring baby boomers will surely impact the productivity and practical capabilities of their replacements. Therefore, the learning abilities of artificial intelligence tools are essential for companies to continue their digital supply chains at high potential. Artificial intelligence will enhance and augment the decision-making process in organizations.

**Reference:**

<sup>1</sup> Ellis, S. (2020). The Path to a Thinking Supply Chain. IDC Technology Spotlight. IDC Research: Framingham, MA.

**Practical Insight****DSC at Schneider Electric**

*"Schneider Electric is a leader in the digital transformation of energy management and automation.*

*In general, stakeholders are placing greater demands on manufacturers regarding product quality and their ability to track and trace product shipments. The manufacturers are responding with demand management and quality strategies. Schneider Electric has responded to these requirements by transforming their supply chain through a process they call —**Tailored, Sustainable, and Connected 4.0 transformation**. This digital transformation process involves not only improvements to their own supply chain but drives supply chain solutions so that their customers can experience the digitalization benefits of rapid return on investment and streamlined operations. "*

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