

In the previous newsletter, we discussed the future of digital supply chain (DSC). We will continue the discussion on DSC in this newsletter focusing on the trends in DSC.

Background

Supply chains have experienced changes since the industrial revolution and the rate of change has increased tremendously in the past few years. Certain changes such as computerized inventory management and enterprise resource planning (ERP) systems have bestowed more efficiency into the supply chains as well as enhancing productivity in a global supply environment. Despite these changes, most companies have retained their traditional operational processes.

However, the ongoing digital age requires more than a few operational tweaks. More companies are using electronic commerce platforms, search engines and social media to drive their supply chains, sourcing, and operations. Some companies have already switched over to cloud platforms and some others are in the process of being cloud customers. Many companies are beginning to embark on digitization and data analytics efforts in supply chain and operations. Yet, most companies are failing to realize their full potential of profits through the use of cloud, Internet of Things (IoT), and data analytics.

Digital Supply Chain Trends

We looked at the future of DSC in the last newsletter. To summarize, future operations involve data analysis and accurate demand forecasting, flexible capacity planning, smart products in smart factories, inter-connected machines and cobots. The future of DSC involves improved decision-making with supplier data, microservice architectures, intelligent edge ecosystems, and digital supply chain twins.

Intelligent digital supply chains aim at optimizing existing resources and capabilities to achieve higher levels of business performance. Digital technologies such as Internet of Things (IoT), integration of data from mobile, social, and transactional platforms, and data analytics are important technologies in today’s trends in digital supply chains. Let us take a look at the current trends in the digital supply chains.



Product complexity

Even before the beginning of the journey to manufacture smart products, companies are seeing that their products are becoming more sophisticated and complex in nature. Complexity of products can involve many factors including better construction materials, additive manufactured products, and sensor integration.

For example, consider a pump manufacturer. Most pumps these days are already equipped with some level of intelligence, typically in the form of sensors and controllers that help optimize their performance. Many pump manufacturers are continuously working to make more energy-efficient pumps without losing quality or reliability. 3D-printed parts to create custom pumps for specific applications is on the rise. The pump manufacturers should also look for alternative materials offering advantages such as reduced weight, improved durability, and more affordable.

Product lifecycle compression

The traditional life cycle of a product is broken into four stages including introduction, growth, maturity, and decline. Product lifecycle compression in digital supply chains begins with accurate demand forecast using data analytics. The crux of the product lifecycle compression is decided by two strategies including retrenchment and turnaround strategies.

Practical Insight

Supply Chain at Tesla

"The best way to understand the upstream risk in supply chains is to map the supply chain. We do this by collecting information on the industries, companies, and locations, wherever possible, back to the raw materials.

We take a risk-based approach to these efforts, starting where there are recognized issues to address. Through this process, we identified our priority materials —Lithium, Nickel, Cobalt, Aluminum, Tin, Tantalum, Tungsten, Gold, and Silica— across which our efforts are described in more detail in the following sections.

Two other areas Tesla has started to map are phlogopite mica, which we use as a thermal barrier for different applications in our vehicle and energy products, and graphite, used in the battery anode.

Phlogopite mica is relatively abundant and affordable, but it has associated risks. Tesla has mapped its mica supply chain and is working toward full traceability. Tesla also engaged with its Tier 1 suppliers and required that they become members of the Responsible Mica Initiative (RMI) and conduct regular audits."

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Retrenchment and turnaround strategies involve compressing business operations to regain product profitability. Withdrawing products from non-profitable markets or removing a product line are some of the ways companies accomplish retrenchment strategy. A turnaround strategy involves restructuring an organization to generate more profit.

For example, an automobile spare parts company's strategy to decrease production of a product line by closing or idling a factory in response to a fall in demand is a retrenchment or turnaround strategy.

Globalization

Components are being sourced from global suppliers to leverage low-cost suppliers and required expertise. This globalization involves effective inventory management, sophisticated logistics, transportation, communications, and information systems. However, such globalization raises many risks and exposures due to geopolitical problems and increasing frequency of natural disasters. Mitigating those risks and predicting effective material sourcing requires insights into supply chains using sophisticated data analytics.

For example, predictive analytics allows organizations to determine optimal inventory levels to satisfy demand while minimizing stock. Using sophisticated predictive models, firms are determining optimal inventory levels that provide detailed inventory requirements and reduced safety stock level information to supply chain managers.

Shipping and logistics

Sensor fusion has been infused in shipping and transportation to monitor fuel consumption, tire pressure, driving style, vehicle condition, and many more. Shipping and transportation costs that often account for a significant percentage of the final product price can be contained by predicting optimal shipping frequency, predictive routes to take traffic congestion, distance, weather, and delivery points into account.

Sourcing

Sourcing is a process that includes activities such as identifying and assessing potential suppliers as well as selecting appropriate suppliers. Sourcing also involves negotiation of contracts, requisition and approval of goods and services, and management of suppliers and outsources. Procurement is concerned with purchasing direct and indirect spending.

Adapting to volatile market conditions by using advances in artificial intelligence (AI) such as extracting deep insights from previously unstructured data is an example of efficient sourcing. Current trends in sourcing strategies include minimizing value chain emissions and securing high-demand green materials.

Green sourcing or sustainable procurement has been adopted by many companies who have an interest in sustaining their business for the near future. A growing need to protect our environment has propelled the adoption of green procurement. Many companies and their supplier partners are obtaining ISO 14001 standard. ISO 14001 consists of the environmental management standards to minimize the impact on the environment by the operations of a company. Receiving the ISO 14001 certificate shows that the company is in compliance with the applicable laws, regulations, and other environmentally oriented requirements. There are more than 300,000 certifications to ISO 14001 in 171 countries around the world.

Green sourcing is about making environmentally conscious decisions throughout the procurement process. Right from the development of the sourcing strategy to purchasing the supplies and disposing the waste, green procurement should be the factor for all the decisions. In addition, firms must incorporate sustainability or corporate social responsibility (CSR) in their business strategies. The procurement strategy is an important part of a business strategy. Companies must endorse and choose to procure environmentally friendly or environmentally preferable goods and services to be in compliance with green procurement.

Tech Briefs

8 steps for the implementation of green sourcing

1. *Incorporate green procurement policies in their procurement strategy,*
2. *Educate the users, suppliers on green procurement,*
3. *Develop green procurement performance metrics,*
4. *Buy and use green products*
5. *Use green services,*
6. *Reduce or eliminate the creation or release of pollutants or toxic compounds,*
7. *Remove pollutants or hazardous waste from the environment, and*
8. *Reduce greenhouse gas emissions.*

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