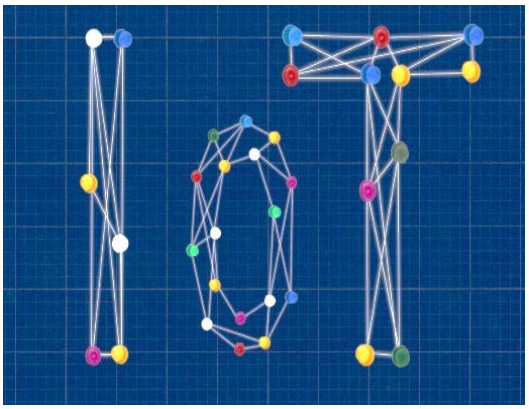
21ST CENTURY SUPPLY CHAIN MANAGEMENT VIA IOT



AUGUST 2018 TECH BRIEF FOR THE TRANSPORTATION, LOGISTICS AND DISTRIBUTION INDUSTRY

Implementing Flexibility at Speed with Volume

Classic Supply Chain Management has, since the mid-1990s, been defined as, "the processes products go through from raw material, manufacturing, distribution to final delivery to the customer… Before that, logistics was used to describe most of these operational activities, but with focus on distribution. The motivation was to eliminate the silos that existed between the different functions and create the notion of end to end supply chain for better efficiency and performance."

This definition has served industry well. However, the proliferation of the Internet, plus increasingly sophisticated clients seeking customized, high-speed product solutions, means logistics must evolve to accommodate a changing vendor-client paradigm.

In this tech brief, we will consider the use of IoT technology to enable manufacturers to adapt current supply chain structures to accommodate the new economic realities.

Labor Force Takeaway

There are three knowledge base areas that are essential for associates working in an IoT environment:

(1) **Networking Knowledge** - IoT data is transmitted across Wi-Fi and 5G networks, from the collection point to the aggregation point.

Cisco CCNA/CCIE certifications in Voice, Cloud, and/or routing and switching are key areas for potential/developing employees to gain expertise.

(2) **Electronics Knowledge** - IoT devices employ the use of sensors and actuators, so a familiarity of electronics and circuitry is also beneficial.

CETa (Associate Certified Electronics Technician) ESA (Electrical Service Associate) and Journeyman/woman CET (Concentration in Computers) will be certifications in demand for employees interested in this space.

(3) **Software and Coding Knowledge** - IoT data collection, aggregation, transport, and reporting will require solid software and coding skills, PLUS a knowledge of cybersecurity to protect sensitive enterprise data.

Certifications in JAVA, MySQL, Python, and Node JS, plus Cisco CCNA in Security will be useful for prospective employees to obtain.

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Supply Streams – not Supply Chains – for TLD Growth

Classic logistics models included four "silos", or handoff points, in the chain – the supplier silo (where raw materials are received at the manufacturing facility), the production silo (where raw materials are converted first to Work-in-Process, and then to finished goods), the warehouse silo (where finished goods are staged for order picking and final shipment), and finally the retail outlet silo (where finished goods are displayed for purchase by the consumer).

However, consumers are now demanding more of their retailers. They want more customization, but with the same delivery time or at faster speeds to market, and with options to institute order changes prior to receipt. Classic supply chain does not support this need for flexibility, and further, it is not interactive – meaning once goods are shipped to the retail outlet, feedback from end users is not captured for future improvements.

IoT will effect change in the traditional logistics model by adding sensors to everything and thereby connecting things in the manufacturing *and* supply chain, effectively changing it to a supply STREAM.

This idealized move to "Intelligent Manufacturing", which blurs the lines between manufacturing and supply chain, will be essential to meshing customized products and small order batches – all the way down to a single unit – while increasing speed and ensuring in-flight adaptive capability. IoT will create this capability with the inclusion of sensors very early in the manufacturing process, which will then be used throughout the manufacturing and shipping stages, to identify not only geo-placement information, but also completion stage, billing, lading - even conditional monitoring, depending on product type and use.

How this might look is as follows: in the auto industry, a new car might be assigned a sensor tag at the beginning of the production process. This sensor tag will contain purchaser information, order specifications, and will instruct the robots – all along the assembly line – how to build the unit. The sensor tag, at assembly completion, becomes the billing and shipping order of record. Orders can then be shipped direct to end user, or in bulk.

Texas Instruments has implemented a supply "stream", combining manufacturing and logistics, like described above, instituting the SwissLog Automated Storage and Order Picking System to manufacture and ship semiconductors and chips around the world. They estimate that since implementing this system, profits have increased by 40%, inventory visibility and accuracy has vastly improved (which also has accounting and tax implications), and products get to market faster and with greater volume than in the past.

The internet and online ordering is driving more custom built and shipped goods. If the supply chain does not adapt, the offers cannot be met. Factories of the past are not as flexible, and the supply chain tends to be invisible. This model can't support the new ordering imperatives. In the new Smart Manufacturing model, the connected supply chain busts the silos which, while giving ownership and control to each silo in the chain, also drives inflexible "handoff points' between silos to better respond to changing demands.

The change must be embraced culturally throughout the organization. If the organization stays siloed and unchanged in how it is organized, no matter how much technology you add, it will not work. With the advent of IoT and 5G technology, the integration of the supply chain into production, the adoption of business intelligence, and a culture that embraces the change, the basis of the new connected enterprise can be realized.

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