Industry 4.0 and the Agile Supply Chain: Materials Inventory Meets AI

Materials inventory is no small matter for manufacturing companies. Duplicate parts in your storeroom place a needless burden on your books, while depleted or inaccurate inventories threaten your supply chain with unexpected downtime when equipment fails. To top things off, managing inventory can become a headache for employees tasked with harmonizing or syncing data from different systems or locations to get an accurate count of parts and supplies.

Luckily, we're at the outset of the Fourth Industrial Revolution, or Industry 4.0—as well as Supply Chain 4.0—where advanced digital technologies like artificial intelligence (AI) are applied to operational processes. The use of AI for materials inventory and data management offers companies a way to manage inventory, costs and uptime while eliminating the manual aspect of resolving real inventory count.

Managing Materials Inventory: The Data Dilemma

Disorganized, disparate and inaccessible data has many causes. Sometimes, it's the data management efficiency of a particular ERP system. Compounding this is the human factor, especially when inputting data.

For example, employees often input only the new material data they find important, without regard to how other colleagues, divisions or facilities reference and search for that same item. In addition, searching for material availability is difficult because ERPs require strict syntax and can be thrown off by typing errors or naming conventions (i.e., searching 120 horsepower vs. 120HP). Either issue could result in a costly and inaccurate inventory count that threatens supply chain efficiency.

ERP systems aren't the sole culprit. With or without the presence of ERP systems, legacy systems can pile on top of one another, adding to the disparate data. As employees get frustrated with cumbersome system processes while balancing daily responsibilities, they replicate their inaccurate search and input practices so they can move to the next task.

While companies are aware of these problems and often dedicate teams of data specialists to clean data and eradicate duplicates, this involves costly and time-consuming manual processes and spreadsheet management. Alternatively, companies can hire consulting firms to clean data, but this is expensive and the data is often outdated before updates are in place.

Agile Supply Chains and the AI Advantage

According to [Deloitte](#), Industry 4.0's "ability to adjust to and learn from data in real time can make organizations more responsive, proactive and predictive, and enables the organization to possibly avoid operational downtime and other productivity challenges." More specifically, AI is an Industry 4.0 technology that can be applied to address materials inventory and data management challenges, keeping procurement in check and production running smoothly for supply chain efficiency.

Here are some of the ways AI fits the Deloitte value proposition when applied in materials inventory management:

1. **Harmonizes Disparate Inventory Systems Data**
    AI-based solutions automatically integrate with ERP and disparate data sources from multiple systems or locations. Then, AI kicks in to learn from your company's inventory experts, encoding this knowledge to provide data harmonization and a true, accurate material master so that uptime and supply chain efficiency are preserved.

2. **Controls Policy and Procedures for Proactive Materials Management**
    When disparate inventory data is harmonized, employees both search for the right materials and see their true quantities—across the enterprise and not in local silos—to prevent over-purchasing.

3. **Predicts Inventory Needs for Continuous Improvement**
    AI builds on the knowledge of your inventory experts to create continuous application and improvement, including offering suggestions to continually optimize inventory allocation and procurement needs. Inventory reports keep your teams performing at the highest level while building trust through accuracy between experts and the harmonized data.

AI's application in materials inventory and data management will result in systems that are more usable, responsive and capable than ever to support agile supply chains. The emergence of AI is replacing frustration with the ability to leverage data for more strategic, creative opportunities to propel companies forward. According to Deloitte, smart, connected Industry 4.0 technologies "can transform organizations themselves: how they make sense of information and act upon it to achieve operational excellence and continually improve the consumer/partner experience."

Needless to say, AI facilitates this and more.