Process or Technology Innovation of the Year

Schneider Electric

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Adaptive ML-Driven “Self-Healing” Supply Chain Saves €100 Million+

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Schneider Electric deployed a "self-healing" supply chain platform that saved more than €100 million. The platform is driven by adaptive machine learning (ML) to optimize performance-related parameters, such as safety stock quantity, minimum order quantities and lead times on a real-time basis.

Schneider's supply chain includes numerous business functions, more than 35 enterprise resource planning (ERP) applications, more than 1,000 master data parameters and 150,000 order lines per day. It relies on hundreds of performance-related data parameters.

The self-healing digital supply chain platform uses adaptive ML, big data, the Internet of Things (IoT) and other digital tools to help performance parameters adapt to changing business environments and maintain optimum supply chain performance autonomously, in real time.

Schneider Electric's supply chain is an orchestration of multiple business functions such as procurement, manufacturing, planning, logistics, customer satisfaction and quality. All these functions coordinate within a framework of standards and processes to ensure efficiency. Although these parameters help Schneider boost its efficiency, they can also become a hindrance and inefficient if they are not regularly tuned to optimal values.

Prior to implementing the adaptive ML-driven "self-healing" platform, Schneider's performance parameters were either static or configured using traditional methods.

This resulted in suboptimal and rigid supply chain operations:

- Inaccurate lead times that forced missed commitments to customers, inaccurate communications and inefficient planning
- Suboptimal safety stock quantity, such as unhealthy stocks worth millions, and potential increases of back orders
- High non-quality costs and low yield from the factory

Following the first wave of the pandemic in 2020, Schneider suffered a massive transport disruption that caused weekly changes in lead times. The company addressed this quickly to avoid suppliers and customers receiving the wrong information, and also avoid major damage to the supply chain and the company's reputation. Schneider deployed the adaptive ML platform to scan all actual worldwide lead times, determine events and anomalies, and also use artificial intelligence (AI) to provide new, accurate lead times that were updated in planning systems automatically.

Three main components of the platform work in the following order:

1. The big data solution component ensures the collection of data from various IT, operational technology (OT) and IoT applications on a real-time or near-real-time basis by leveraging data lakes, data streaming tools, data virtualization and data integration tools.
2. The adaptive ML models then consume the data, learn from any changes and complete the process by using AI/deep learning and an ML algorithm to determine optimum values for various supply chain parameters.
3. Once parameter values are determined, depending on their schedule, software robots and integrated programs ensure synchronization between the latest parameter values across the IT, IoT and OT applications. These robots and programs work 24 hours, 365 days a year, continuously monitoring any changes to business senvironments and achieving optimization through the adaptive ML.

For example, the safety stock quantity parameter was traditionally updated quarterly and didn't reflect changing sales and supply trends constantly. With the new adaptive platform, sales, purchase and forecast data are taken from ERPs, where distributions are analyzed by ML algorithms, and optimum safety stocks are recommended at the distribution center and SKU level in near real time.

Benefits:

- All three technologies work together, automatically and with no human interventions, except in situations of exception handling.
- Business stakeholders can monitor these parameter values at any time.
- The autonomous nature makes the platform people-independent and sustainable at any point in time.
- Day-in inventory is reduced by six days, resulting in 10% overall inventory reduction.
- Average 15% yield improvement on select manufacturing lines.
- More than €100 million value-add to the business and €30 million in productivity gained.
- Increase of 400 basis points on customer satisfaction, with six days' delivery time reduction.

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