Logistics Operational Excellence through Connected Supply Chain

LOGISTICS / OPERATIONAL EXCELLENCE

Across industries, supply chain management has traditionally struggled with the underlying challenge of operating in reactive mode—causing organizations to fall short of predicting or keeping up with supply and demand. Companies successful at managing the supply chain recognize the power of data and analytics, and how both allow them to optimize processes and account for variability. Staying ahead of otherwise unforeseen supply spikes and dips effectively helps balance working capital, mitigate risk, and improve business outcomes.

Today, the availability of huge volumes of data—from sensors, material movement, and status—is changing the way supply chain operations are managed. Real-time information captured at various stages along the supply chain can now be used to drive operational efficiency, helping organizations transform from being reactive to proactive.

The Transformation: Teradata Supply Chain Analytics

Leading approaches to supply chain processes establish, manage, and leverage the data fabric. These approaches consist of tightly coupled information with the supply chain environment, as well as loosely and/or uncoupled data from various sources, including third parties. Data is accessed in real time, and analytical models are applied to monitor and streamline the supply chain. Following are some key areas of focus to achieve this ideal level.

Real-Time Data Acquisition: The data ingestion process acquires data in real time from every stage in the supply chain to capture deviations from expected conditions and assess variability. For example, ambient data—such as weather and road conditions—provides insights into possible deviations from the expected delivery lead-time. Similarly, GPS data captured via sensors located on a carrier, along with driver break schedules and speed changes on route, provide insights into delays.

Predictive Analytics: Real-time data, along with variability based on historical information, allows a starting point for analytics to kick in—providing insights into potential impact. Machine learning techniques can potentially consider factors beyond statistical methods and seasonality adjustments to predict consumption patterns.

Figure 1: A layered data ecosystem—accommodating tightly, loosely, and uncoupled data—is needed to support the connected supply chain.

A combination of predictive demand modeling and real-time assessment of factors effecting material movement provides clear visibility into projected KPIs, enabling responsive business actions:

- Rerouting
- Visibility into end consumer
- Reprioritization of production/shipping schedules
- Changes in inventory levels
- Network redesign

Drive Actions: Analytics and insights are most meaningful when converted into actions that help mitigate business challenges. Deep integration with execution systems, while closing the loop by monitoring their impact,

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is necessary. As an example, an action could mean evaluating a service level agreement (e.g., penalties, customer satisfaction, and impact to business) against the cost of alternate actions (e.g., schedules, production plans, inventory consumption, and demand).

Feedback Loop: Data insights are captured over time to assess the need for changing something along the supply chain, such as the warehousing network, supplier base, source and destination pairs for fulfillment, or alternate material for production. What-if scenarios and their impact should be explored with access to all relevant costs/benefits, before implementing a change. In some cases, what-if engines might evolve to "solvers", which can determine optimal methods for improving outcomes.

Decision Orchestration and Automation: Once optimal action is selected, its execution must be coordinated with supply chain operational systems. As organizations work to automate decision making, a policy framework should be developed that defines which actions can be executed autonomously, and which should go through a workflow of approvals. Over time, as the results of such autonomous and analytics-assisted decisions are logged and evaluated, more decision making can be automated.

Visualization/Interface: Powerful visualization mechanisms are needed to identify hotspots in the supply chain, as well as other areas of need. The data fabric, along with the infrastructure, provides the capability to leverage BI tools to enable visualization, powered by robust analytics.

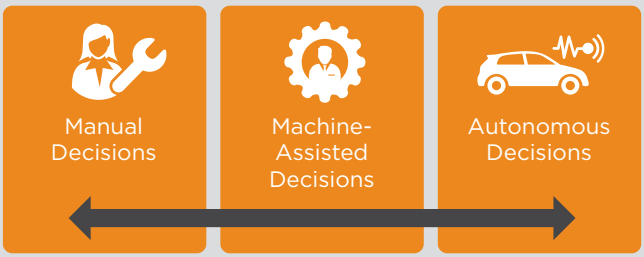

Figure 2: A well-organized, policy-based framework allows an organization to move from manual to autonomous decisioning while carefully managing risk.

Operational Benefits

Data Model: Used to enable operational excellence, the data fabric taps into the data warehousing environments with minimal time and effort (i.e., time spent on moving data across multiple locations and duplicating enormous amounts of data).

Scalability: The ecosystem connects across various execution systems enabling an easy-to-scale platform for all business needs requiring analytical capability.

Supply Chain Operations Impacted

- Identify load/routes causing the most service level issues
- Determine where inventory must be adjusted to meet expected demand; understand where trade marketing investments are affecting sales
- Identify which plants and products are constraining sales
- Evaluate causes and costs of logistics and manufacturing expediting
- Identify which nodes are causing a bottleneck

Supply Chain Benefits

- Improved delivery time
- Quicker, real-time response to delays
- Reduced operational expenses
- Optimized logistics
- Safety improvements
- Better customer service levels
- Lower impact due to unforeseen events

The Teradata Advantage

Teradata empowers companies to achieve high-impact business outcomes. With a portfolio of business analytics solutions, architecture consulting, and industry-leading big data and analytics technology, Teradata unleashes the potential of great companies.

For more information about Teradata and achieving operational excellence through the connected supply chain, visit Teradata.com.

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