One Network Enterprises™

Multi-Echelon Inventory Optimization (MEIO) and Planning

Improve Supply Chain Network Performance, Responsiveness, Resiliency, and Financial Health

CRITICAL BUSINESS CHALLENGES

Organizations managing complex global supply chains struggle to maintain and improve business performance. This is true across automotive, manufacturing, aerospace, government sectors, retail, CPG, food service, healthcare, pharmaceutical, and high-tech industries. It's hard enough to execute to a plan – let alone optimize it.

Key challenges are holding back organizations as they take on digital initiatives. Current legacy systems cannot keep up with the 'Now' paradigm: Just-in-time, eCommerce, and real-time responsiveness and collaboration. In a complex and decentralized supply chain with a large number of products and raw and intermediate materials, carrying incorrect inventory levels at the wrong place and at the wrong time within your four walls and across a multi-echelon network of partners can cause serious performance problems.

In this hyper-competitive environment, the inability to meet target service levels can have serious impacts. This can occur because of out-of-stocks, fill-rate problems, and inventory shortages throughout the supply chain, and damaging effects can include:

- Loss of revenue and even market-share
- Lower customer satisfaction and loyalty
- Delays in production
- Higher labor and logistics expediting costs to prevent production line downtime

Because of shorter and shorter product shelf life, inventory surplus will increase waste, risk of obsolescence, and costs, while decreasing product quality and profitability. For example:

- Risk of obsolescence can turn into significant loss in manufacturing and aerospace
- Freshness in grocery retail and food service is key to winning higher margin transactions

Solving these problems is possible and requires a scalable solution that can:

- Identify and maintain desired service levels with optimal inventory levels and investments
- Continuously balance supply and demand across the entire supply chain network in order to respond to customer needs
- Propagate demand in real-time across the many tiers of suppliers, in both the internal and external supply network (including logistics service providers)
- Resolve exceptions as they occur, and in more difficult cases, enable effective decisions with recommendations and relevant information

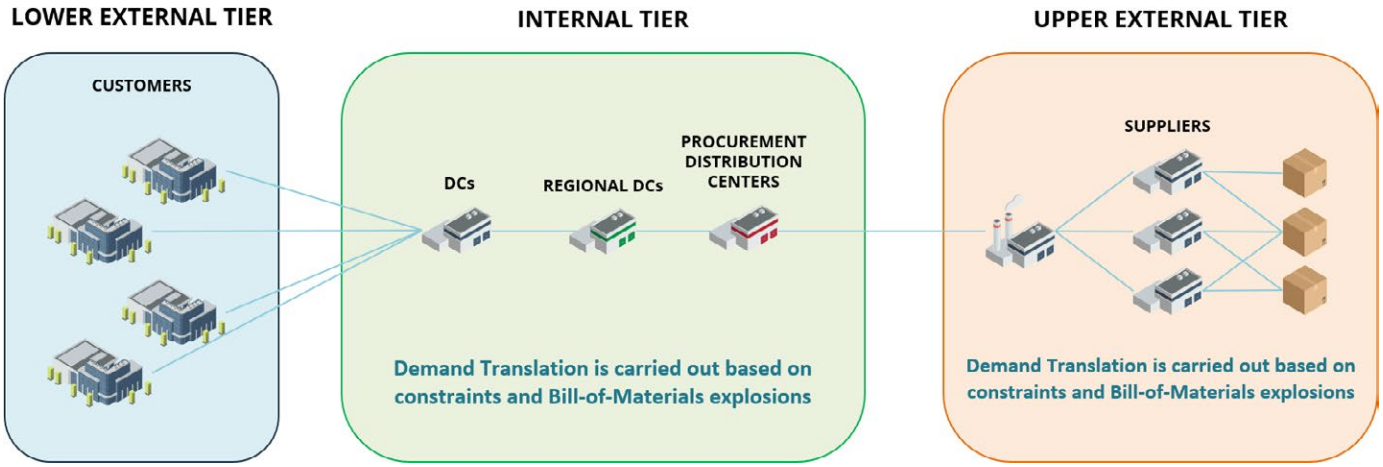
The underlying cause of these problems is the inability to perform inventory planning and scenario analysis across the entire supply chain. Where current ERP solutions fall short, the One Network solution excels: It can perform Multi-Echelon Inventory Optimization (MEIO) and Planning with single version of the truth (SVOT) for the entire value network. This method of aligning inventory in near real time across multiple tiers offers enormous benefits to many industries.

KEY OPERATIONAL BENEFITS:

- **Inventory optimization for multi-item, multi-echelon across the entire real-time business network**
- **Clear visibility of network-wide and site inventory costs and fill rates per item**
- **What-if scenarios and simulations to help form the best decisions**
- **Recommendations for optimal stocking levels given target service levels and a broad set of constraints**
- **Intelligent agent NEO to manage autonomous demand propagation and replenishment to fulfill the optimized plans**
- **Synchronized execution across the end-to-end supply chain network**

KEY FINANCIAL BENEFITS

- **Reduce network-wide inventory by 20% to 40%**
- **Improve service levels to over 95% with other services such as autonomous replenishment and integrated order and transportation execution.**
- **Increase revenue due to reduced stockouts**
- **Reduce waste by 20% to 40% with better inventory mobilization**
- **Reduce expedited cost by 30% to 50%**
- **Reduced overall planning cycle time and effort by 50%**



MULTI-ECHELON INVENTORY OPTIMIZATION (MEIO) AND PLANNING IN A REAL-TIME NETWORK ENVIRONMENT

Multi Echelon Inventory Optimization and Planning optimizes the inventory costs, subject to configured target fill rates (desired service levels), enterprise-wide constraints (budgets), site constraints (capacity), and item constraints (critical items). The highly scalable solution runs for multiple sites and multiple items concurrently in order to balance the needs across the entire network.

There are several key elements of the platform that maximize the utility and benefits of Multi-Echelon Inventory Optimization and Planning:

- The One Network platform enables the ability to model the end-to-end value chain (i.e. from retail outlets, dealerships, restaurants, hospitals, or military locations to DCs all the way to n-tier suppliers) as a single ecosystem. This provides the real-time, single version of the truth for all network participants. One Network's extensive supply chain network modules simultaneously and continuously plan and execute demand, supply, and logistics related operations.
- One Network's Intelligent Autonomous Agents, called NEO, are continuously monitoring the network for any changes. Once changes are detected, NEO autonomously propagates applicable changes both upstream and downstream to balance the demand-supply equation.
- One Network's Multi-Enterprise Master Data Management (MDM) enables partners in the supply chain network to reconcile master data efficiently and accurately in order to manage information about customers, products, raw and intermediate materials, suppliers, locations, and other entities. Network-wide partners need to connect once only to the shared network solution.

In this real-time multi-party network, the solution autonomously determines the optimal inventory settings for different order policies:

- Stocking level and reorder quantity for dynamic policies
- Reorder point, reorder quantity, and order up to limit for the static policies such as min/max, Kanban, and static ROP

The solution builds a network of all items and all sites. The scope of the network can best be illustrated in an example. In the diagram above, there are three tiers of locations that are internal to the user. In addition, there is a Lower External Tier and an Upper External Tier. The Lower External Tier is defined as the locations that are external to the user but generate demand on locations in an Internal Tier. The Upper External Tier is made up of locations that are external to the user, but fulfill demand from (send supply to) locations in an Internal Tier.

HOW THE ONE NETWORK SOLUTION OPTIMIZES INVENTORY

The solution optimizes inventory across the network by:

- Choosing a dynamic or static inventory policy for each inventory location reflecting the actual inventory policy
- Calculating optimal inventory management parameters (service levels and replenishment settings) simultaneously across multiple tiers in a supply network such that the total inventory cost of supply chain is minimized. NEO considers all appropriate and available data, including:
  - Lead times and variability
  - Demand history
  - Supply history
  - Forecast history
  - Enterprise-wide constraints (budgets), site constraints (capacity), and item constraints (critical items, shelf life, parts substitution)

  The solution ***supports multiple supply and demand sources per location***. The solution optimizes inventory parameters for particular inventory location without changing settings across the whole supply chain. Each inventory location could be configured to be enabled or disabled for this process. The lead times take into account information from ***both direct and indirect upstream suppliers***.

The output is a set of recommended settings for every inventory location according to required order policy:

- The desired fill rate for the network as well as the minimum, desired, and maximum fill rate for each node in the network
- Units and cost of stock levels for internal and for the entire network
- Min, Max, reorder point, reorder quantity settings

In addition, the solution provides detailed information about data statistics and search iterations and enables users to apply recommended settings to the inventory policy. Across industries, companies are seeing the benefits and achieving dramatic results for supply chain optimization at enormous scale.

Automotive and Manufacturing

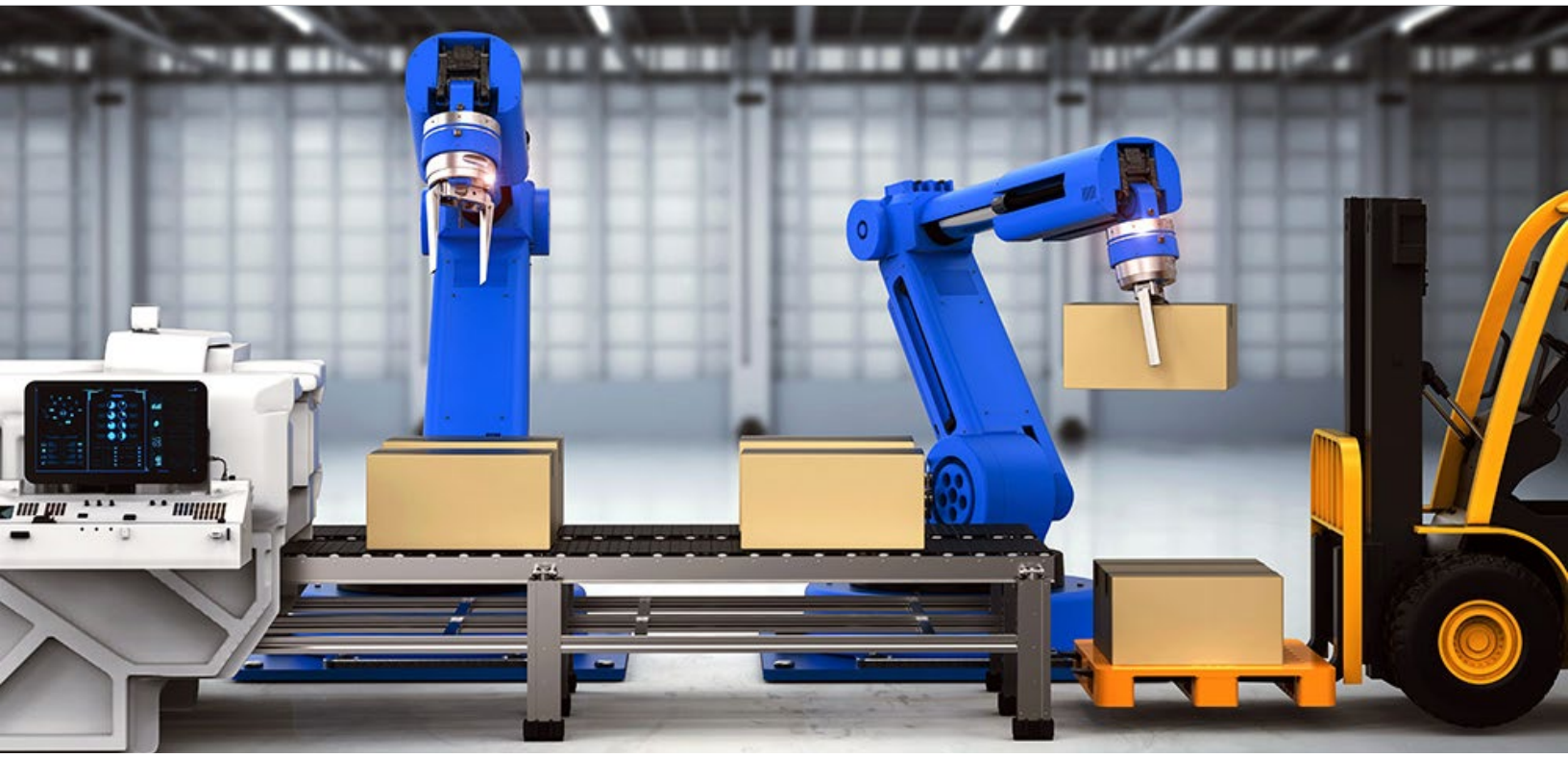
The One Network platform boosts supply chain performance with the sharing of applications and data on one common network. The "Network Effect" allows the entire supply chain to be viewed, managed and optimized as one unified system as opposed to many small systems. The effect is particularly acute in the automotive and manufacturing industries because of the massive numbers of parties involved in the collective group of OEMs, Tier-1s to Tier-N suppliers, logistics providers, and contract providers.

A critical element is inventory and the factors that form the decisions on the stocking levels. Without a good way to optimize inventory and service levels, organizations risk losing control of their inventory. These operational challenges exacerbate the situation:

- Many markets are cyclical in nature and experience volatility in demand
- Cyclical fluctuation in supply base capacity
- Frequent demand changes
- Frequent part revisions
- Supply variability
- Master data, item mapping, and transaction cleanness and availability
- Limited forecasting accuracy together with extended forecasting cycle time along the chain
- Many siloed ERP systems and the resulting limits in visibility and information access across businesses

To counter the "bull whip" effects that get amplified along their complex supply networks, manufacturers are leveraging One Network and its inventory optimization and planning to help overcome these chronic challenges. For the aftermarket parts business for a tier-1 manufacturer, for example, the solution first explodes the bill-of-materials (BOM) in a demand translation process, then it optimizes across four tiers to:

- Enhance integrated materials planning with network-wide inventory planning, in addition to improved forecasting, demand translation, advanced replenishment, and last-minute allocation (LMA)
- Resolve small problems with continuous inventory planning before they become large problems elsewhere
- Satisfy the intraday delivery paradigm for many JIT processes with high (95%+) service levels



CPG and Retail

Consumer durables and non-durables manufacturers are embarking upon advanced vendor-managed inventory (VMI) initiatives to serve customers and retailers better. For example, a toy manufacturer is leveraging the solutions to fine-tune the optimal quantities of toys at the stores, balance factors such as customer service levels, and better control the amount of toys offered at bargain prices (which could erode brand value).

Another example comes from a consumer electronics manufacturer of very short product lifecycle products, targeting young adults and their fast-changing tastes. With product lives measured in months and weeks, the manufacturer is leveraging the multi-party network to go as deep into the tiers of suppliers as possible (up to 4th tier) in order to plan and collaborate on forecast, order, capacity, and multi-echelon inventory.

In the past, such organizations had to hand-pick products and perform analysis based on their consumption velocity and margins, in order to assign a Product Class (i.e. A, B, C). They then went through an exercise of classifying products into these buckets for stocking and order policies. Now, in determining the inventory carrying strategies, they can carry out such optimization simultaneously for all products with consideration of costs, margins, budgets and space constraints. The optimization of the much-constrained supply gives organizations **new opportunities to further reduce supply costs and improve revenue and cash flow**.

PROVEN SOLUTIONS AND RECOGNIZED LEADERSHIP FROM ONE NETWORK ENTERPRISES

To enhance the customer-driven business network, One Network's **Multi-Echelon Inventory Optimization and Planning** is a critical element in improving supply chain network performance, responsiveness, resiliency, and financial health.

Industry analysts have praised One Network's innovative vision for supply chain visibility, collaboration, and automation. In 2018, **Gartner** recognized One Network Enterprises as a Leader in its "Magic Quadrant for Multienterprise Supply Chain Business Networks" report. The company was also ranked highest for the fourth consecutive year as a Leader in **Nucleus Research**'s "Control Tower Technology Value Matrix for 2019."

ABOUT ONE NETWORK

One Network is the intelligent business platform for autonomous supply chain management. Powered by NEO, One Network's machine learning and intelligent agent technology, this multi-party digital platform delivers rapid results at a fraction of the cost of legacy solutions. The platform includes modular, adaptable industry solutions for multi-party business that help companies lower costs, improve service levels and run more efficiently, with less waste. This SaaS and aPaaS platform enables leading global organizations to achieve dramatic supply chain network benefits and efficiencies across their ecosystem of business partners. One Network offers developer tools that allow organizations to design, build and run multi-party applications. Leading global organizations have joined One Network, helping to transform industries like Retail, Food Service, Consumer Goods, Automotive, Healthcare, Public Sector, Defense and Logistics. To date, more than 75,000 companies have joined One Network's Real Time Value Network™ (RTVN™). Headquartered in Dallas, One Network also has offices in Japan, Europe, and India. For more information, please visit www.onenetwork.com.

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