

Supply Chain Network Based Distributed Order Management Enabled Through Dynamic Sourcing

The goal of a distributed order management system (DOM) is to intelligently broker orders across the varied and disparate systems and processes utilized by the multiple parties involved in replenishing an order. This paper explains the best way to achieve that, by providing a global view of all available inventory in order to intelligently source the line item components of that order. This ensures that the business can meet both current and future customer demand while optimizing inventory, logistics, and asset utilization.

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THE ROCKY ROAD TO DISTRIBUTED ORDER MANAGEMENT

The goal of a distributed order management system (DOM) is to intelligently broker orders across the varied and disparate systems and processes utilized by the multiple parties involved in replenishing an order. The best way to achieve this goal is to provide a global view of all available inventory in order to intelligently source the line item components of that order, ensuring that the business can meet both current and future customer demand while optimizing inventory, logistics, and asset utilization.

Of course driving responsive replenishment through short term forecasts has been approached using multiple methods in the past, all with limited success. Flowcasting generates a store-level forecast for each SKU which is then propagated upstream in the supply chain and aggregated into replenishment requirements.

Another approach has been to try and mirror store-level ordering policies by writing algorithms that estimate store order policy logic.

Yet a third approach has been to take demand data and apply pattern recognition algorithms to fine tune demand for different short term periods such as week to week using data from various supply chain nodes.

THE LIMITS OF TRADITIONAL APPROACHES

To really deliver on the ability to intelligently broker and source orders across a complex network, the DOM must advance beyond just the demand side solutions utilized in the past and leverage an advanced dynamic sourcing (DS) capability. Legacy ERP infrastructures were designed to be static rather than dynamic, supporting individual sales channels with single threaded supply schema and segmenting groups of customers by channel, rather than as a network of individuals.

While companies have been using the techniques described above to focus on transforming the customer-facing experience, they have been constantly challenged on the back end to optimize both their inventory management and their supply chains. Their hope would be to enable real-time, enterprise-wide insight into inventory coupled with an adaptive, flexible supply chain.

In addition, a growing number of market forces are making it imperative that global companies consider leveraging a dynamic sourcing footprint. Their sourcing decisions must encompass an increasing number of variables such as lead times, logistics costs, currency swings, regulations and political climates.

Industry analysts have also weighed in on the supply network ecosystem leveraging a global grid. Global connectivity and advancements in IoT will drive vast stores of information which will create both big opportunities and risk. As we have seen with the pandemic, we will continue to see increasing supply/demand variance along with periodic shortages in

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many natural resources and materials leading to greater volatility in prices and supply. And we will see new economic drivers such as those related to increasing government regulation on a global basis, as well as new pressures from customers and consumers in areas such as sustainability and social responsibility.

Legacy order management systems are configured to link to a discrete number of specific plants or warehouses. This of course limits inventory visibility as well as the options companies have in sourcing their items. It also fails to account for deliveries and associated services that are increasingly part of the customer order and fulfillment process. Without comprehensive visibility to internal and external inventory locations, including delivery and service requirements, it is proving impossible to provide an accurate promise date to the customer, schedule orders to alternative fulfillment locations, or deliver on ever increasing OTIF targets.

ONE'S DISTRIBUTED ORDER MANAGEMENT AND DYNAMIC SOURCING

Customer service levels can only be maintained with accurate and timely information. Because companies maintain multiple databases of order information across multiple ERP instances, they are forced to manage by individual channel, rather than across channels. ONE's Distributed Order Management and Dynamic Sourcing capability aggregates orders from multiple channels and provides a single source of information across these channels. All information and activity related to that order is available across a multi-party network, basically providing a single version of the truth, governed by a highly secure permission-based framework.

Expanding further, the network enables the demand hub to "see" supplier inventory along with their available to promise (ATP). Given the network is seamless from planning through execution, the planned order then flows through order promising and order execution and supports both make-to-stock (MTS) and make-to-order (MTO) capabilities. The system can also flex from MTS to MTO given the potential business benefits. Once the order is brokered across the dynamic supply base, the production requirements are generated as part of the flow through execution across the network.

Many orders contain multiple line items which are brokered across multiple suppliers in the network. These items may need to be coordinated into a single shipment to the end customer driving the need for a fully integrated logistics process to be part and parcel to the order management process. This would amplify the benefits of DOM/Dynamic Sourcing given logistics were leveraged to increase sourcing availability coupled with delivering on least landed cost objectives at targeted customer service levels.

From a technology perspective, the ONE DOM/DS capability serves as a platform backbone, enabling the selling, replenishment, and logistics processes for multi-party business transactions across multiple echelons in a supply network. In other words it is an ecommerce engine, providing a network based solution for managing information, executing processes, and monitoring performance to ensure customer orders are fulfilled accurately and cost efficiently across a complex network of sourcing and fulfillment processes.



Key capabilities include intelligent order forecast sourcing, global inventory visibility, real time order execution, and autonomous forecasting in order to be responsive to shifting customer demands.

Technology advancements have made this capability a reality. In order to accomplish this level of DOM/DS performance, a significant amount of data must be modeled, captured, analyzed and transacted across a complex set of high performing processes. It would be overwhelming for any group of individuals to try and forecast, plan, order, and replenish using enterprise-based ERP systems limited by point-to-point integration across trading partners.

It is today's AI/ML based decision agents, both autonomous and interactive, that provide the advanced ability to automate order execution based on targeted KPI's, guided resolution through interactive workbenches or predefined sets of rules and policies to optimize customer service levels, inventories, and overall costs.

Distributed Order Management isn't a new concept; however, it is advancing significantly by combining it with Dynamic Sourcing and making it available as a global network service. Today's requirement is moving away from simply a monolithic hub and spoke enterprise system to one that is a multi-tier, multi-party hub to hub network architecture enabling the entire trading partner ecosystem, upstream through tier 2+ and downstream to the end consumer.

The traditional view of a DOM system has been limited to being a behind-the-scenes, supply-side facing system trying

to effectively and efficiently manage orders across a diverse supply network where seamless integration to multiple inventory sources was the hope, but was never really achieved.

ONE advanced the traditional view of a DOM system by not only providing this seamless integration, but also adding the ability to automatically generate purchase orders when supplies are needed based on optimized replenishment policies.

Coupled with this came an event-based warning capability which could deploy automated policies through autonomous or interactive agents designed to resolve any exceptions or issues disrupting the flow of supply and demand.

ONE's DOM/DS solution is globally available as a federated network service, leveraging our cloud-based capabilities to provide increased visibility to all network trading partners, providing inventory, order, and shipment status information to customers and suppliers across any combination of channels.

As part of the overall ONE Platform, the DOM/DS solution coexists in the same planning/execution network application instance as capabilities such as Direct-to-Consumer, Intelligent Demand, Intelligent Supply, Inbound Material Optimization, Intelligent Logistics, Aftermarket/MRO, and many more. Additional platform services provide integration with legacy ERP infrastructure, both from a customer facing as well as a supplier facing perspective.

The ability to operate in a dual platform configuration with ERP from both a customer and supplier perspective will allow

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ONE to enable a real time dynamic demand driven capability which can leverage the legacy ERP static infrastructure. For example:

ERP uses a forecast or master production schedule as an input to calculate parent and component level part net requirements. Part planning is therefore based on a “push” created by these projected demand requirements. ONE will surround this limitation and leverage both known and planned part traits to dynamically resize inventory levels based on real time demand and variability.

ERP uses a fixed reorder quantity, order points, and safety stock that do not adjust to actual market demand and struggle with seasonality. ONE will dynamically adjust buffer levels as the part specific traits change according to actual performance over a rolling time horizon.

ERP provides no early warning indicators of potential stock outs or demand spikes. ONE provides an order variance horizon which looks out over the cumulative lead times of

items to identify anomalous sales orders. This allows the plan to effectively compensate for known upcoming spikes in demand.

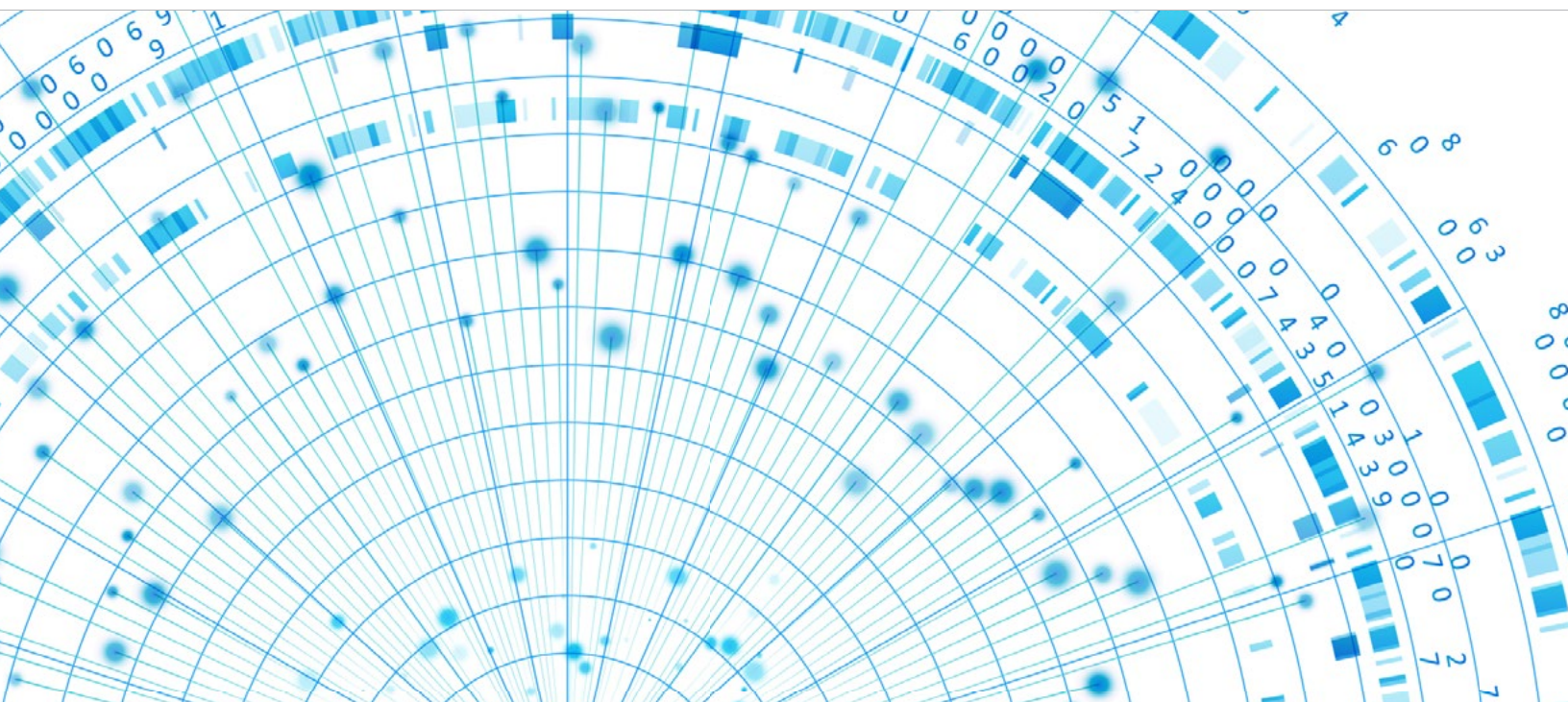
ERP treats past due requirements and orders to replenish safety stock as “Due Now.” ONE assigns all order due dates based up on quoted lead time in a make to order environment or based on cumulative lead time in the case of buffered stock. ONE then adjusts projected lead teams based on real-time tracking data. In addition, ONE provides severity attributes in order to execute efficient order reallocation schemes when suppliers are short.

In summary, many of ONE's real-time network capabilities come into play when deploying a distributed order management solution supported by dynamic sourcing. From the DOM/DS perspective we deploy full life cycle capabilities around both Order-to-Cash as well as Procure-to-Pay. The focus is on customer satisfaction, perfect order fulfillment, asset optimization and effective working capital management.



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Joe is certified in AI/ML from MIT Sloan, is an alumnus of Harvard Business School, and holds degrees in Applied Mathematics and Statistics and Mechanical Engineering. He is a past award winner in the Mathematics Olympiad competition, authored the patent for Extended Enterprise Planning across a Supply Chain, and has been listed by Supply and Demand Chain Executive Magazine as a Pro to Know for the past two years.



ABOUT ONE NETWORK

One Network is the leader in intelligent control towers for autonomous supply chain management. From inbound supply to outbound order fulfilment and logistics, this multi-tier, multiparty digital platform helps optimize and automate planning and execution across the entire Digital Supply Chain™ network and every trading partner. Powered by NEO, One Network's machine learning and intelligent agent technology, real time predictive and prescriptive analytics enable industry-leading performance for the highest services levels and product quality at the lowest possible cost. It's the industry's only solution with a fully integrated data model from the consumer to suppliers and all logistics partners, providing a network-wide, real-time single version of the truth. Leading global organizations have joined One Network, transforming industries like Retail, Food Service, Consumer Goods, Automotive, Healthcare, Public Sector, Telecom, Defense, and Logistics. Headquartered in Dallas, One Network has offices across the Americas, Europe, and APAC. For more information visit www.onenetwork.com



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