

# Intelligent Control Towers: Optimize Your Supply Chain with AI & Advanced Analytics

Complete visibility with automation and prescriptive analytics  
across your supply network to maximize performance

*For the fifth straight year, One Network Enterprises has been named a Leader in Nucleus Research's Control Tower Technology Value Matrix. Supply Chain Control Towers play an essential role in helping businesses successfully make the transition from siloed legacy systems to a collaborative, resilient, real-time digital business network. From visibility and alerting to prescriptive decision support to full AI-based automation, demand for Control Tower technology is at a peak as global businesses view these as requirements for optimized supply chain management. In this paper, we explain the success factors for an effective Control Tower strategy and provide a Capabilities Checklist of essential requirements.*

## WHAT IS A SUPPLY CHAIN CONTROL TOWER?

Control towers originated as an attempt to bring together data and intelligence from across the supply chain, and were originally conceived as a command center or “war room” - a physical location that brought together analysts along with data from multiple systems and trading partners. This provided more visibility to the supply chain and aggregated information to help make decisions and coordinate the supply chain.

**What is a Control Tower?** A Control Tower is a supply chain management system embodying real-time visibility, decision-making, and execution capabilities across the end-to-end supply chain. It enables views and actions on orders and shipments down to individual items, and enables collaboration across all participants. The Control Tower runs on real-time data in a single shared database, and can be implemented and used by any and all trading partners in the supply chain. Providing much more than basic visibility, today Control Towers provide predictive and prescriptive analytics for advanced problem solving and optimization at the network level. They also include extensive capabilities for automation and resolution of routine tasks, freeing your supply chain experts to focus on the highest value decision-making.

### Driving the Need for Control Towers

For companies worldwide, recent events have exposed enormous gaps in supply chain systems and processes, as companies struggled in their response to supply and demand disruptions. They’ve often faced the inability to answer basic questions, such as:

- Where is my shipment?
- When will it arrive?
- What’s causing the delay? What customer orders are impacted?
- Where have I got a problem? How do I solve it at lowest cost yet keep high service levels?
- How should I reallocate my supply to fulfill this customer demand?
- What will it cost, and who else will be impacted?
- What’s my demand across all channels?
- How do I optimize my decisions across the region, when all my decisions are so interconnected?
- How can I offload routine chores, so I have more time to focus on what matters?

### CONTROL TOWER OPERATIONAL BENEFITS

- A comprehensive supply chain and logistics model that represents all parties and processes, from planning through execution, using AI-enabled network-optimization
- Dramatically reduces the need to manually manage and integrate data across internal systems and external partners
- Quickly identifies in real time the issues impacting performance and resolves them quickly
- Advanced analytics, reporting and insight leverage a single version of the truth (SVOT) to drive improved performance across supply, logistics and fulfillment
- Early warning to potential issues eliminates knock-on effects
- Detailed tracking of transactional and resolution history for continuous improvement
- Detailed tracking and tracing of products ensures promises and commitments are met
- Enhances trust across trading partners as partners work from real-time data and a single version of the truth
- Supports carrier loyalty in a time of driver shortages and carrier rate volatility
- 3PLs can unlock new sources of revenue across your customer base by offering new services and levels of visibility
- Instantly connect to alternate or new trading partners on the network, including suppliers, carriers, wholesales, distributors and customers

### CONTROL TOWER FINANCIAL BENEFITS

- 30-50% reduction in premium freight costs
  - 10-40% reduction in overall annual transportation costs
  - 2-10% increase in equipment utilization
  - 10-30% inventory reduction across healthcare, CPG, retail and auto-industrial segments
  - 12-50% reduction in manual planning, scheduling and execution management overhead
  - 1-8% improvement in inbound delivery performance and outbound customer service levels
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- What are my alternative sources of supply?
  - How can I communicate with my suppliers and carriers more quickly when there’s a disruption?
  - How can I on-board new suppliers more quickly?
  - Why didn’t they tell me?

## MULTIPARTY NETWORK-BASED CONTROL TOWERS

Network-based Control Towers operate on a single database - a single version of the truth - with all services orchestrated intelligently across the suppliers, customers, carriers, co-manufacturers, and distributors in your business network. This is a key differentiator in a network-based strategy.

A second differentiator is that optimization and decision-making take into account the capacities and constraints across the network to ensure the highest service levels at the lowest landed cost. This network-level view delivers superior value compared to optimizing one-enterprise-at-a-time, because this approach considers the complex cost and service level tradeoffs for situations with hundreds or thousands of orders for businesses with potentially tens of thousands of SKUs. This is why an effective Control Tower needs to be a network application spanning the end-to-end supply chain, that includes all trading partners from the source of supply to the point of consumption.

As explained in Chainlink Research's report, Understanding Supply Chain Network Technology: "The new Networked Enterprise Model of the 21st century requires implementing a supply chain trading partner operating model that supports the networked enterprise, providing interoperability and visibility with reduced complexity. The supply chain trading partner operating model is a codification and automation of the key processes, policies, performance metrics and technology that govern your supply chain partner relationships."

A real-time, multiparty network realizes this networked model. It enables a Control Tower with deep functionality across your full network of trading partners. It provides both visibility and actionability. You can both plan and execute across all functions, trading partners, and time horizons.

### Features of a Control Tower on a Multiparty Network

Many technology providers claim to have networks, but separate applications connected together, interconnected silos, or hub-and-spoke models are very different from true multiparty networks. Only a real-time "single version of the truth" network provides the instant connectivity and data-sharing that are necessary for accurate and timely Control Tower functionality. A network-based Control Tower supports and enables the complex multiparty processes that a supply chain involves, with:

- One data model, one master data management system (MDM), one database, one UI for all functions, both planning and execution, and all enterprises. This provides a real-time, single version of the truth for all parties, enabling better optimization and decision-making.
- Orchestrated multiparty decision-making with awareness of real-time constraints and execution status of each party involved.
- Network-level optimization of planning and operations across all customers - not just for one customer's Control Tower goals.
- Autonomous execution across multiple parties not just one enterprise.
- Shared end-to-end supply chain services for network participants on a SVOT platform to align operations with overall network goals.
- Instant virtual connections for new partners and network participants, enabling agile trading communities that can serve demand better by quickly pulling in new suppliers/partners, and disabling obsolete connections.
- The ability to develop new services on the network while retaining IP ownership and no technical debt incurred with customizations.

#### SUPPLY CHALLENGES

- Supply variability
- Supplier capacity issues
- Quality issues
- Shipment delays
- Overdue shipments
- Lack of visibility on direct ship orders

#### LOGISTICS CHALLENGES

- Increased expediting costs
- Increased premium freight costs
- Poor coordination among carriers
- Labor intensive processes
- Increasing inventories
- Lack of warehouse capacity with increased safety stocks
- Customs congestion

#### CUSTOMER/CHANNEL CHALLENGES

- Demand variability
- Forecast inaccuracy
- Increased backorders
- Lack of reliable ETA on backorders
- Increased returns
- Customer order cancellations
- Lack of deliveries visibility

# Supply Chain CONTROL TOWER

1

## BASIC VISIBILITY

Visibility to all the milestones and events you want to track across the entire network.

2

## ALERTS

Receive alerts based on the SLA and lead times tagged to all events and milestones and you collaborate in real time to resolve them.

3

## DECISION SUPPORT

Planning and execution within the control tower. Users make decisions based on recommendations from intelligent agents.

4

## AUTONOMOUS

The intelligent agents embedded within the execution layer run the supply network without human intervention.

**ONLY ONE NETWORK**

## LEVELS OF CONTROL TOWER MATURITY

### 1. End-to-End and Real-Time Visibility

Bringing together parties, facilities and transportation into a single network view. You have visibility to all events and milestones that you want to track.

To successfully represent the complete logistics lifecycle across a network of supply chain participants (warehouses, plants, DCs, carriers, LSPs, customers, contract manufacturers, and suppliers), the Supply Chain Control Tower solution serves as a system of engagement, integrating and harmonizing data across internal and external players. It also operates with the capability to embrace many systems and to assume control of any point in the shipment execution lifecycle as needed, possibly even serving to replace legacy or redundant systems.

By integrating transaction information across all parties, the Control Tower solution enables real time visibility of the entire logistics lifecycle from purchase order to shipment order, shipment execution, track and trace, delivery, and to financial settlement.

### 2. Performance Measurement, Predictive Analytics and Alerts

End-to-end visibility is further supported by robust permissions and dashboarding configuration that allow all participants to view and analyze in real time, only the data relevant to their organization and user role.

- Operational dashboards are configurable at the user level and include all the tasks and alerts relevant to each specific role. Using these operational dashboards, users can drill into each task and alert to quickly resolve any issues.
- Command and control monitoring provide a management overview of the health of the network configurable to their unique perspective.
- Operational data views provide real-time visibility of transactions where users can build customized reports, leverage reporting templates and create data cubes or pivot tables.
- Enterprise slicing allows users to easily import data into other operational or reporting tools.

### Advanced Reporting

One Network provides a suite of pre-built reporting templates to support standard performance analysis on customers, lanes, carriers and vendors (on-time and in-full) as well as any exceptions and root causes. The network-supported reporting mechanisms provide unmatched opportunities to improve cost and service within the organization and across the network.

### Intelligent Supply Chain Management

Intelligent NEO agents are built into the NEO Platform and run on top of the execution data, combining other streaming data sources that compare the plan in real-time and predict ETAs and other events. Exceptions are managed through a case management capability that drives root-cause analytics and derives intelligent performance and predicted service insights.

### 3. Decision Support, Recommendations, Case Management and Prescriptive Workflows

The system continuously compares planned activities to actuals, determines the likely impact, alerts relevant parties of deviations, and recommends solutions so that exceptions can be managed quickly and optimally.

A network-enabled Control Tower goes beyond what traditional supply chain and TMS solutions can accomplish, by allowing network participants to collaborate on time-sensitive issues in real time. With a full suite of case management capabilities, all partners can manage issues that occur during the execution process.

With real-time end-to-end visibility and actionability, across demand channels, supply sources, and all modes of transportation, the system is able to continuously compare planned activities to actuals. It can determine the likely impact, alert relevant parties of deviations, and recommend solutions, so that exceptions can be managed quickly and effectively. Features include:

- An issue state machine to monitor open, in progress, cancelled, resolved and closed issues
- Root cause analytics with reason and resolution codes
- User collaboration allows users to assign ownership and chat in real-time, with chat history recorded within transactions for auditing purposes
- Audit and reporting to summarize issue history within transactional context

Prescriptive workflows go even further to seamlessly incorporate all facilities, such as plants, warehouses, yard and dock scheduling operations, into the end-to-end workflow. Processes that are frequently managed across separate systems or via manual communication between Shipper, 3PL and Carrier, can now be streamlined across all parties where specific roles, activities and performance metrics can be established for optimized operations.

### 4. Autonomous Network Control

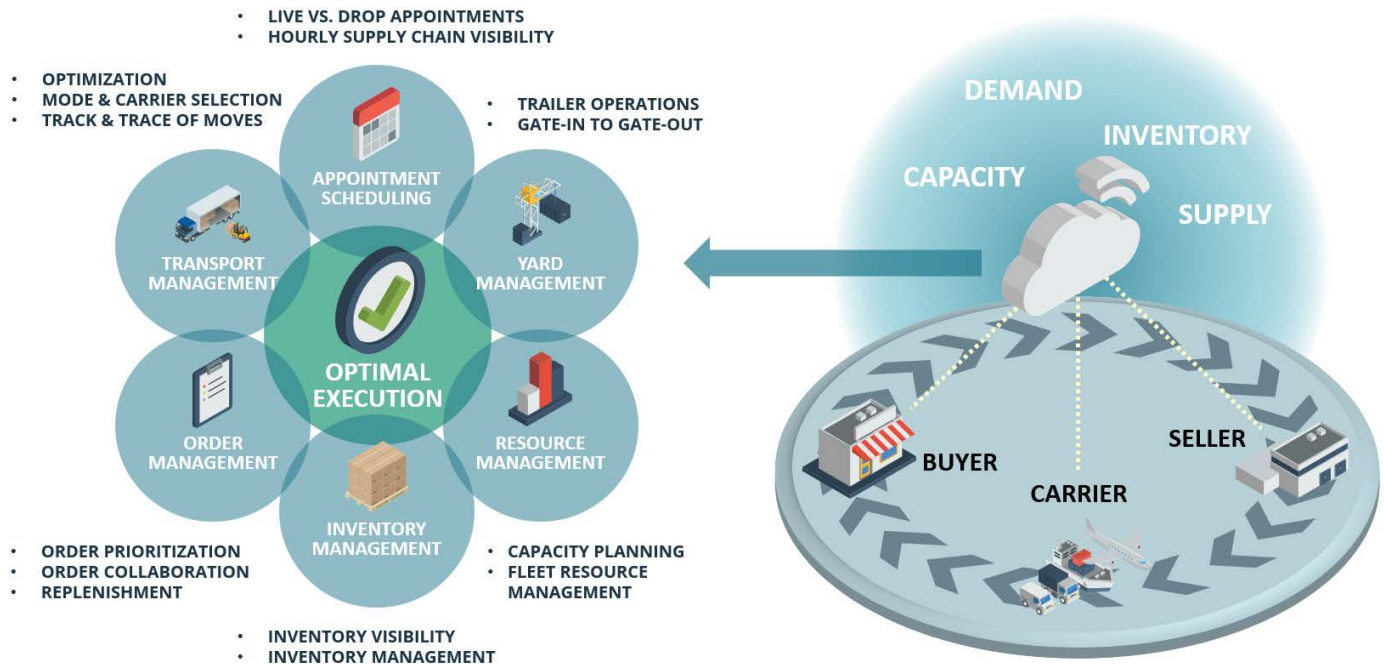
Intelligent autonomous agents propose solutions, identify the best option, and execute it.

At this level of Control Tower maturity, many suggested resolutions and user-managed actions can be gradually converted to **automated network actions**. The Intelligent Control Tower goes beyond detecting trends and automating issue resolution, and can propose optimal solutions at the network level to improve operational efficiencies and maximize service levels.

A Control Tower on a real-time demand and supply network across all trading partners, surfaces many more problems than you've ever been able to handle in the past. You can define limits and boundaries for automated decision-making (decision "guardrails") and automate decision-making to resolve problems that are within those "guardrails" as a normal course of business.

The autonomous NEO agents include advanced planning and optimization algorithms that can autonomously make and execute decisions within your guardrails. Agents can do things like adjust and create orders, modify or change inventory policies, forecast transport capacity, perform transport optimization for dedicated and common carrier equipment, as well as the advanced scheduling of DC appointments.

This is an evolution of capabilities - and not an all-or-nothing proposition. It involves experimentation, evolution, trust in automation results, and human supervision, until agents are surpassing expectations and then can run autonomously. Your staff can gradually cede autonomy to intelligent agents where it makes sense, and then only within certain products or parameters. As the system learns, improves and proves itself, it gains more and more autonomy. Ultimately, the intelligent agents embedded within the execution layer can run the supply network with little human intervention.



### Find Problems Faster, Solve Them with Better Solutions

Control Towers on this multiparty network architecture, not only expose many more problems in your network sooner (while there's still time to fix them), they also provide many more ways to solve a problem. When the architecture treats all variables in the system as dependent and being driven by the desired outcome, then the Control Tower offers a wide range of solutions for each and every problem in the network.

A multi-echelon supply network problem can be solved in many different ways, for example, by adding shifts, expediting, allocations, postponement, etc. In fact, certain problems can have 4 or 5 different solutions involving many different parts of the supply network, each having a different business effect on the network outcome. The AI engine can rank these choices based on setting various business strategies for market share vs. revenue vs. margin generation vs. customer service vs. resiliency, etc.

### Workbenches with Predictive and Prescriptive Analytics

Problems that fall within your guardrails can be resolved autonomously. Those that fall outside that safety zone are elevated to your staff and the optimization workbenches in the Control Tower.

Using the Control Tower workbenches, planners, schedulers, distributors, shippers, operators, manufacturers, etc., can review all the factors and all recommendations before executing a solution and/or collaborating with partners to explore other options.

Workbenches support all functions across the supply chain, including:

- Logistics Planner Workbench
- Order Expedite Workbench
- Supply Planner Workbench
- Vendor CSR Workbench
- Global Demand-Supply Match Workbench
- Demand Planner Workbench
- Inventory Planner Workbench
- Warehouse Manager Workbench
- Production Planner Workbench

The autonomous level offers significant advantages - detecting more issues, earlier, and resolving them faster, cheaper and more optimally. Through increased automation, businesses will be able to reduce the high manual overhead associated with many supply chain tasks, including order generation, inventory optimization, tracking, issue resolution, optimal demand-supply matching, and support. You will be able to offer greater levels of service and value to your end customers at the lowest possible cost.

## THE ONE INTELLIGENT CONTROL TOWER: WHAT MAKES IT DIFFERENT

An effective Supply Chain Control Tower is much more than a fancy dashboard. Most important is the planning and execution architecture that underlies the Control Tower and determines the quality of the data, the range of functionality, the ability to scale, and its future flexibility. One Network's Control Tower is supported and powered by the NEO Platform, the patented real-time, multiparty network platform that powers the Real Time Value Network. Here are some of the unique features that this network platform makes possible.

**Truly One Network, One Solution:** One Network has been a technology leader for more than 15 years, and the advance that has provided the greatest performance benefit for customers is the sharing of applications, data, and transactions on one common business network. Here the entire supply chain can be viewed, managed and optimized as one unified system, as opposed to many small, disparate parts. The platform's end-to-end capabilities have been conceived and built entirely by One Network to be network-based, using a single database, a single UI, for a single one integrated and intelligent set of network services. They are not a collection separately acquired, stitched-together systems. This unified network solution is unique in the industry.

**The Network Effect:** Any new company joining the One Network community has immediate access to this established business network of manufacturers, suppliers, customers, and logistics partners. This is the "Network Effect", which is particularly advantageous in many industries because of the massive numbers of parties involved in the collective group of manufacturers, suppliers, Tier-1s, Tier-2s, logistics providers, distributors, and contract manufacturers. The total number of parties can be in the thousands. Companies only need to on-board once, and chances are good that many of your customers, suppliers, and logistics providers are already on the network, greatly accelerating projects and time-to-value.

**A Single Version of the Truth:** Having all business partners on one backbone lets information flow throughout the network seamlessly and in near real time. This means uncertainty and variability are minimized, reducing the "bullwhip effect," where order quantities are distorted and amplified upstream

in the supply chain. It also means a problem anywhere in the network is quickly recognized and can be dealt with in a fraction of the time of former approaches. This reduces the "bullwhip effect" on disruptions, where a disruption in the supply chain gets amplified as it traverses upstream and affects the rest of the supply chain. The longer the time for the original disruption to be felt elsewhere in the network, the greater the amplification. Squelching small problems before they become large problems requires quick notice and action - one of the many benefits the Network approach.

**A Complete Set of End-to-End Capabilities:** One Network is the only solution that offers a seamless, integrated and comprehensive suite of solutions across all supply chain functions. These enable planning, execution and optimization across all supply chain functions, to maximize results. This lets companies maximize efficiencies by coordinating their replenishment process with the logistics planning and execution process, thus optimizing service levels, inventories and operational costs concurrently. As Gartner recently stated (May 2020), "One Network's solutions cover processes across supply chain planning as well as supply chain execution with a single transaction backbone and master data management system. **Its ability to offer this supply chain convergence is leading among providers.**"

**Rapid Partner On-Boarding Services:** One Network uses a rapid onboarding and automatic quality assurance testing process, which enabled hundreds of suppliers, carriers, and freight forwarders to be onboarded in weeks instead of months. It also enables a service model for a service model for onboarding new partners, as well as facilitating the elimination of those no longer required.

**Hub-to-Hub Optimized Execution – Concurrent and Across Tiers:** With continuous and incremental supply-demand matching in real time, your business can ensure that inbound supply is truly demand-driven and matches the needs of your end customer at the other end of the value chain. While other solution providers may claim this at a high level, One Network enables this in real time at every level of granularity and time horizon - even at the item level. The system enables discrete ordering with inventory min-max controls, delivering product just-in-time for your production sequence, including daily and intra-day if needed.



**Truly Integrated Inventory, Logistics and Order Management:** With One Network, system lead-times approach zero. With a real-time view into inbounds, inventories, and shifting demands you'll find information lags are minimized or eliminated, enabling you to increase service levels even as you dramatically reduce inventories. You'll eliminate excess inventory buffers and the costs that go along with them, as well as the problems of having too much of the wrong product at the wrong location. These include markdowns, spoilage, waste, and otherwise outdated products. With One Network, shipment visibility goes much deeper and includes visibility into every order that makes up the shipment. And the inventory that makes up the shipment (even in the container) can be used for dynamic decision-making in real time and is available for dynamic reallocation to orders – just like any other inventory quantity in your warehouses, plants, or retail locations. This explains why One Network helps optimize business performance with automation and prescriptive analytics in ways that others can't – to drive extraordinary value.

**Multiparty Collaboration Across 3PLs, 4PLs, Forwarders, Corporate and Suppliers:** With Global Demand-Supply Matching and process orchestration across business partners, One Network enables you to identify supply chain exceptions in real time and resolve them optimally at the network level through multiparty collaborative workbenches. The workbenches use intelligent algorithms and the latest in artificial intelligence and machine learning technology, to provide automated decision-making and prescriptive analytics. We call that global real-time visibility with actionability.

**A DevNet-Enabled Modular Architecture Enables Extensibility:** Let's face it – no solution will fully match your needs out-of-the-box. That's where the One Network platform is designed to be highly extensible and enables swap-ability of core modules. This enables a solution that fits your requirements as if built to purpose, yet is fully supported during its lifecycle with One Network's "never legacy" approach. It also helps provide rapid deployments implemented through a "value first" agile methodology for a self-funding strategy where value is realized each step of the way.

## IN SUMMARY

As a recognized Leader in Control Towers for the fifth consecutive year (Nucleus Research, 2020), One Network Enterprises will help your business successfully make the transition from siloed legacy systems to a collaborative, real-time digital business network. From visibility and alerting to prescriptive decision support to full AI-based automation, One Network's Control Tower technology is a highly differentiated offering that will enable **optimized supply chain performance that is unattainable via any other platform.**

Our aim is to help you achieve the highest possible service levels at the lowest possible cost. Moving well beyond basic supply chain visibility, One Network's Supply Chain Control Tower Solution on the NEO Platform provides predictive and prescriptive analytics for advanced problem solving and optimization at the network level, along with extensive capabilities for automation and resolution of routine tasks, freeing your supply chain experts to focus on the highest value decision-making and orchestration of your end-to-end process.

## CONTROL TOWER CAPABILITIES CHECKLIST

As you consider your Control Tower options, if you can't check all these boxes regarding Supply Chain Control Tower capabilities, you'll be relegated to sub-optimal performance in your supply chain operations.

### **Is there a Real-Time Single Version of the Truth (SVOT)?**

It's impossible to optimize without this. Without SVOT, you'll be limited to sub-optimal solutions based on guesswork and stale data. A Control Tower needs to surface the critical facts as they stand now, so that you can make effective decisions based on fact, optimize based on actual resources and constraints, and respond to potential problems early, when many low cost options still exist - and before things get critical and costly.

### **Is the Visibility Truly End-to-End?**

Across your entire supply network and every business partner. Required to optimize operations across all customers, not just one.

### **Can You Plan and Execute in One Platform?**

Essential in today's environment that has turned planning on its head. When past trends are no longer a good predictor of future demand, you need to ensure an agile response regardless of what the future holds. You'll need a way to incrementally plan and execute all day long.

### **Are Alerting and Decision-Making Happening in Real-Time with Prescriptive Analytics?**

Solve problems in real time with predictive and prescriptive analytics. Identify and solve problems early, when you have many options, and optimize at the network level rather than one-issue-at-a-time.

### **Does it Enable Autonomous Supply Chain Management and Optimization?**

Automate routine tasks and apply intelligent agent technology for more complex optimization, attaining Level 4 capabilities.

### **Can You Perform Global Demand-Supply Matching?**

Consolidate all demand across all channels, and view every source of supply for continuous demand and supply matching to optimize service levels and costs.

### **Is it a Hub-to-Hub Model?**

This is a big one. Architecture matters as it enables or inhibits every transaction and process running through the Control Tower. Point-to-point integrations are costly to maintain, inefficient, and not scalable. Your Control Tower needs to run on a multi-enterprise, many-to-many business network, because your business requires network applications spanning multiple supply chain functions and trading partners.

### **Is it Scalable?**

Your business network may include thousands of trading partners and millions of daily transactions, so a Control Tower needs to handle the speed and volumes of modern business networks. Outdated hub-and-spoke strategies are point-to-point integrations that often mean the data is incomplete, stale, or completely missing. A multiparty, hub-to-hub network model is scalable and real-time so decision-making is actionable, accurate, and optimized.

### **Is there a Low Entry Barrier and High Value?**

Implement systematically in a phased approach – one step at a time - for a self-funding model that provides immediate value at low risk, and bring on new capabilities with a “tunable system of control” that matches your priorities, and targets the highest value areas first.



## ABOUT ONE NETWORK ENTERPRISES

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, tens of thousands of 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](http://www.onenetwork.com).



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