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# CONTROL TOWER TECHNOLOGY VALUE MATRIX 2019

## ANALYST

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## THE BOTTOM LINE

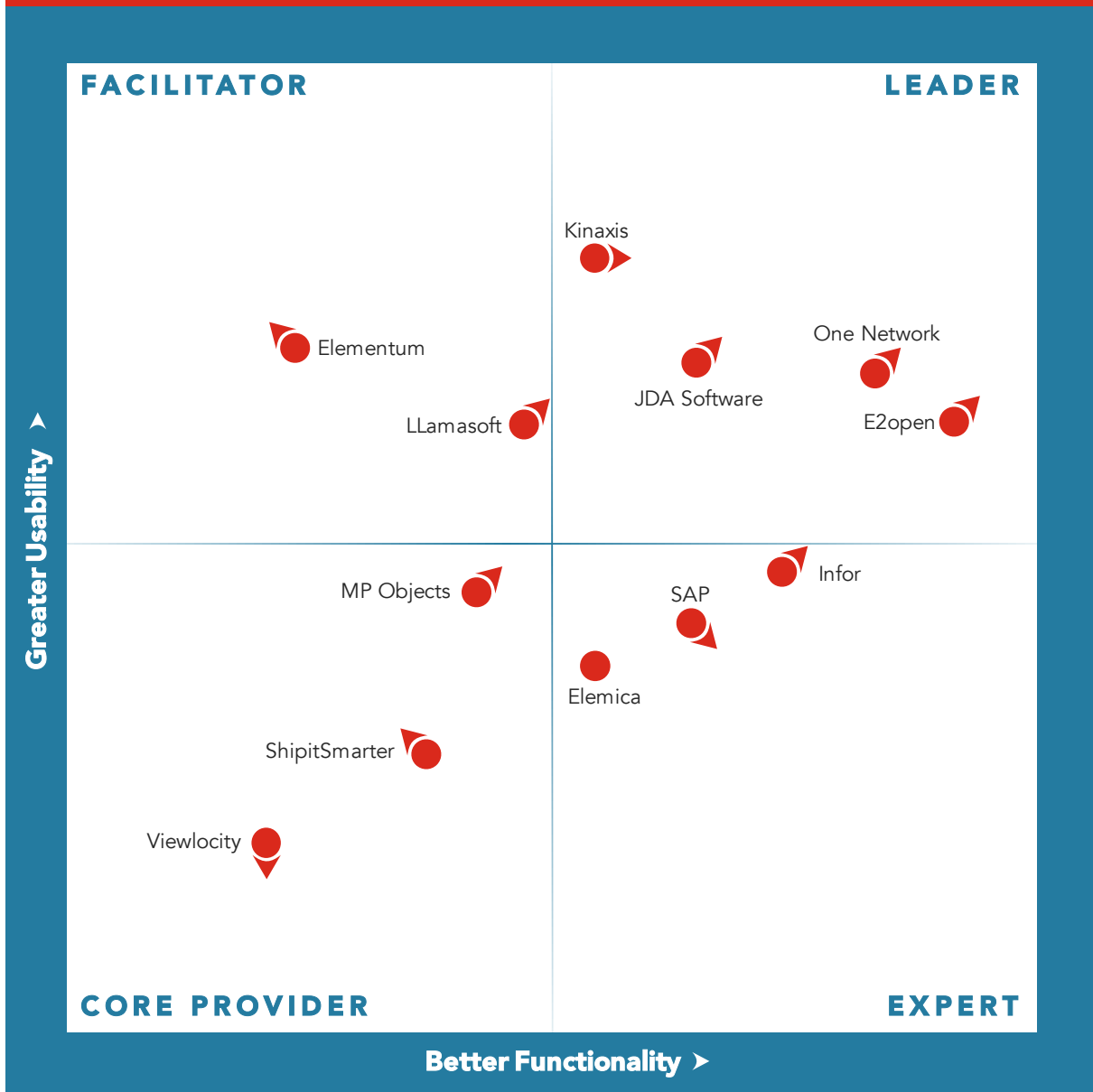
As customers are looking for greater visibility of their extended value chains, supply chain software vendors are answering the call, providing solutions that cut across functional and organizational silos. The market for control tower solutions continues to remain fragmented with many vendors finding success in industry verticals and specializing in particular areas such as planning, execution, order management, logistics, and trading partners. Although originally designed to deliver visibility, some vendors are shifting their control towers to be where the promise of the autonomous supply chain is realized.

# CONTROL TOWER

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## MARKET OVERVIEW

It has been a busy year for supply chain control tower software vendors with more customers looking to answer the oft-asked question, "Where's my stuff?"

Originally designed to deliver a view of a customer's operations for planning or execution purposes, control tower software has expanded to include data and modeling of multiple tiers of suppliers, logistics providers, and partners. Vendors have moved their solutions from simply providing visibility to providing more orchestration and insights based on consolidated data generated by the entire value chain. As the need for more relevant and recent information has accelerated, vendors have been tasked with providing the same level of visibility and insights in near real time. As a result, control towers can represent a significant departure from what customers are often accustomed to, which typically involves organizational silos and disjointed systems.

In this Value Matrix, Nucleus provides a snapshot of the market based on how vendors are delivering value to customers through the usability and functionality of their software (Nucleus Research *S142 – Understanding the Value Matrix*, September 2018). The Value Matrix also captures the direction vendors are headed relative to the rest of the market with respect to the investments they are making today that promise to deliver value in the future. This is helpful for both customers and prospects to understand what a vendor is bringing to market today and what to expect moving forward.

Vendors are delivering value with their control tower solutions in several ways; however, a customer's ability to manage change is often the biggest limiting factor in the level of sophistication and capabilities that customers can adopt. As a result, despite vendors looking to provide more automation and orchestration across multiple tiers of the supply chain, many customers are limited in their usage of the advanced technologies that control towers deliver. Leading vendors are leveraging machine learning (ML) and artificial intelligence (AI) algorithms that can review historical performance data and the larger contextual picture when exceptions arise. While they are primarily rules-based techniques, the use cases in the supply chain are promising with the breadth of data from heterogeneous sources that control towers can capture. Nucleus found that customers are starting to adopt capabilities that surface recommendations for how to address exceptions; however, most use cases are still narrow and limited in their deployments.

The market for control tower solutions continues to remain fragmented as vendors have been successful carving out expertise in particular spots along the value chain or in certain industries. One major market change was E2open's acquisition of Amber Road, prompting the latter's removal from this year's Matrix. Nucleus found that many companies are still confronted with legacy systems that are often supplemented with Microsoft Excel (Nucleus Research, *T123 – Beyond Excel in supply chain planning*, August 2019). The overall maturity of the market continued to lag behind other areas of enterprise software, with vendors continuing to outpace what customers are able to implement effectively. As a result, control towers will remain an area of supply chain technology to watch, as it often serves as a useful entry point for vendors that offer extended functionality in planning and execution.

## LEADERS

Leaders in the 2019 Control Tower Technology Value Matrix include E2open, JDA Software, Kinaxis, and One Network.

### E2OPEN

E2open continues as a Leader in the 2019 edition of the Control Tower Value Matrix. Since publication of last year's Value Matrix, the vendor has made several moves to extend its functionality and enable customers to run its applications end-to-end. Most significantly, E2open completed its acquisition of Amber Road, which previously featured in this Value Matrix, focusing on global trade management. Amber Road's solution connects customers with overseas suppliers, logistics providers, freights forwarders, customers brokers, and carriers. With the addition of Amber Road and other logistics acquisitions including INTTRA and Cloud Logistics, E2open now offers customers software to manage each stage of their supply chain from suppliers to global trade and logistics, and channel partners.

The vendor has been making strides to consolidate the myriad of solutions it has acquired in recent years. Since the release of its Harmony user interface, all new deployments of its applications have been under Harmony, giving customers a unified interface through which they can access E2open's planning and execution applications. E2open has introduced several usability enhancements since the last iteration of the Value Matrix, including activity streams that provide tools for collaboration as well as predictive and prescriptive analytics to aid with decision making for users.

E2open looks to provide customers with the power to orchestrate with multiple tiers of trading partners by offering a single version of the truth on its trading network. With a suite of applications that span the functional needs of planning and execution in large enterprises, the vendor is well positioned to deliver on the end-to-end visibility and control required of modern control tower solutions. Nucleus sees the aggressive moves E2open has made in the market as indicative of its commitment to expand the reach of its global, multi-enterprise network, and deliver continued value to customers.

### JDA SOFTWARE

JDA Software is a Leader in the 2019 Control Tower Value Matrix. The vendor's new control tower solution, Luminate Control Tower, provides visibility over planning and execution, enabling close collaboration between customers and their external stakeholders. Since its acquisition of Blue Yonder in August 2018, JDA has accelerated towards its goal of providing decision support and an autonomous supply chain. To that end, JDA has put Blue Yonder's AI and ML technology at the center of the JDA platform, embedding the

capabilities in all its applications (Nucleus Research *T74 – JDA refreshes vision at ICON 2019*, May 2019). Nucleus found that customers are starting to realize value from the technologies even if use cases are relatively narrow, showing the promise that ML has in a supply chain context.

The vendor has made a host of updates to the Luminate Control Tower since its initial release. Customers can on-board suppliers to Luminate and integrate directly with carriers to gain better real-time visibility and improve collaboration. Additional collaboration is facilitated by the Situation Room, where customers can review exceptions and gain insights from ML analysis of historical data. JDA has bought several improvements to the usability of the product with easier search and filtering, lot and batch traceability, and a mobile application.

On the roadmap, JDA is continuing its push forward with the Luminate applications, including supply resolution and collaboration. The vendor is focusing on delivering decision support to customers, with the control tower solution generating several prescriptive recommendations through machine learning analysis. The system is able to review historical data as well as contextual, real-time data. Although the use of ML is still in its infancy, JDA is demonstrating where it can effectively be applied through the early adopters of Luminate Control Tower. Nucleus expects the vendor to continue gain traction in the market with its latest control tower solution and maintain its position as a Leader in future editions of the Value Matrix.

## KINAXIS

Kinaxis is a Leader in the 2019 Control Tower Value Matrix as it continues to deliver value to customers with its suite of RapidResponse applications that cover integrated business planning, demand planning, supply planning, inventory planning, and production planning. The vendor is firmly focused on providing planners with a real-time view an organization's entire ecosystem, eliminating silos between functional groups within a company, as well as an extended view outside the company's four walls.

With its control tower, Kinaxis provides visuals, tuning and optimization, and collaboration tools to gain insights into opportunities, with a roadmap planned to expand to command and control capabilities. Kinaxis has begun to introduce machine learning algorithms to analyze key planning inputs to predict future values based on historical performance. The vendor is focused on delivering the Self-Healing Supply Chain with its planning engine. In order to improve collaboration and integration of external data, Kinaxis provides a predefined interface that exchanges outbound and inbound data related to demand, availability, capacity, and tracking.

A key area of investment for Kinaxis is expanding its RapidResponse platform, which gives customers a suite of tools to create integrations, models, and algorithms within the platform. The vendor has already deployed the authoring and integration studios that help customers build no-code extensions to the platform as well as establish integrations to bring more data into the planning engine. Enabling customers to import and build more visualizations, machine learning models, and create algorithms is on the RapidResponse roadmap.

With practical applications of technology and ease of use as central tenets of the vendor's strategy, Nucleus found that the approach resonates with customers that have often been bogged down with legacy solutions and internal silos. As Kinaxis continues to expand its solution to deliver greater functionality and more capabilities in supply chain execution, Nucleus expects the vendor's position in future versions of the Value Matrix to improve.

## ONE NETWORK ENTERPRISES

One Network continues as a Leader in the 2019 edition of the Control Tower Value Matrix. The vendor is focused on scaling its multi-enterprise network to support more global customers. One Network has built a network of networks around the industry verticals it serves, such as retail, high tech, restaurant and food service, pharmaceuticals, aerospace and defense, and automotive.

Customers can connect with multiple tiers of suppliers, channel partners, and logistics providers on a single, federated network, thereby ensuring the same real-time version of the truth for all parties and allowing customers to share and control the depth of visibility afforded to partners. As a result, customers can collaborate with other parties on the network across processes in planning and execution, such as forecast collaboration, inventory optimization, supply planning, and transportation planning and execution.

One Network has made strides to deliver more autonomous capabilities to customers through what the vendor calls "NEO intelligent agents," which are designed to automate the handling of supply chain exceptions and decision making, thus increasing productivity for users. Through the use of AI and machine learning technology embedded in the execution layer of the network, customers can assign a system to support decision making or perform tasks independently. Re-optimization or re-planning occurs around elements—such as region, time, or item—that partition the overall network, enabling customers to make decisions and take action in real time.

The vendor has redesigned user interfaces for core functionality, as well as helped to facilitate users taking advantage of the NEO agents. Customers have the option to switch to the new user interface which delivers data visualization of key performance indicators, quick navigation options, and drilldowns. The interface has flexible layout options and quick access to exceptions, search, alerts, and other menus. Dashboards contain widgets that

come out of the box and give customers the flexibility to customize their views. Overall, Nucleus expects the vendor to continue to push the boundaries of what control tower solutions can deliver.

## EXPERTS

Experts in the 2019 edition of the Control Tower Technology Value Matrix include Elemica, Infor, and SAP.

### ELEMICA

Elemica is positioned as an Expert in the 2019 edition of the Control Tower Value Matrix. The vendor provides visibility into several key areas for customers in process industries with its Digital Supply Network: network participants, shipments, risk and quality. Supply chain quality is the latest addition to the vendor's functionality with its acquisition of EMNS, a material quality compliance company, which was completed in March 2019. Elemica's control tower capabilities sit on top of its platform, offering end-to-end visibility and monitoring. The solution looks to enable customers to gather and leverage data from their extended value chain and uses rules-based engine and machine learning algorithms to monitor changes between requested and confirmed quantities, and surface warnings proactively. Customers can also analyze transactions in order to surface relevant insights.

Elemica offers real-time shipment visibility to monitor and proactively manage the movement of goods between points on the supply chain. Customers can identify shipments at risk of arriving late to their destination and enables real-time visibility to the location of all shipments. The vendor also incorporates supply chain threat detection, qualification, early warning, and network assessment. The solution helps quantify the effect of disruptions to the supply chain by correlating risk incidents with customer network assets. Elemica therefore offers a strong solution set for visibility into supply chain health and can be helpful in accurately planning for the future with the ability to quantify the impact of disruptive events on the supply chain.

With deep domain expertise in process industries, Elemica brings the breadth of capabilities that are tailored to deliver value to customers in those industries. It was announced that Elemica was acquired by the global investment company, Eurazeo, in August 2019. If the vendor's ability to invest and expand is improved by investment from Eurazeo, Nucleus expects customers to see Elemica's roadmap accelerate and progress towards the goal of helping customer digitize their supply chain network.

## INFOR

Infor is an Expert in the 2019 edition of the Control Tower Value Matrix, with its Infor Nexus control tower solution. The vendor rebranded GT Nexus Digital Network as Infor Nexus in March 2019 after announcing its control tower solution, Control Center, in September 2018. Infor plans to make the solution generally available by the end of this year, but has been successful with early adopters and demonstrated the platform's ability to be the foundation for global network visibility.

Part of Infor's strategy is to deliver an autonomous supply chain. To that end, the vendor is facilitating customers leveraging the investments Infor has made in bringing AI and ML to its applications through Infor Coleman. With a history of supporting global trade operations by connecting trading partners and providing end-to-end visibility, Infor Nexus is expanding its functionality to include real-time GPS tracking of air and truck freight, which it already has for ocean shipping. The solution also captures detailed cargo information in addition to geo-location, including temperature and status, with plans to add risk-assessment functionality such as weather and geopolitical events.

To improve the usability of the product, Infor is aiming to bring all the functionality available through the desktop interface to mobile devices. Delivering a digital representation of the extended supply chain has been a staple of the Nexus control tower. With Infor Nexus, customers can observe the value chain as it dynamically changes, rather than through static KPIs like lead time and production. The vendor is also bringing prescriptive resolutions to the solution, with self-tuning analyses that calibrate based on past events and performance.

After a few years of uncertainty post-acquisition, the rebranded Infor Nexus is pushing forward with many of the capabilities Infor has brought to its suite of enterprise applications. Nucleus expects that customers will realize additional benefits beyond what GT Nexus delivered as a stand-alone solution and improve its position in future iterations of the Value Matrix.

## SAP

SAP is an Expert in the 2019 Control Tower Value Matrix. The SAP Supply Chain Control Tower provides real-time visibility with robust analytics that can track exceptions and improve visibility for end users. The solution can operate within the SAP Integrated Business Planning (IBP) platform but can also be deployed with SAP Leonardo for analytics and SAP Ariba for supply chain collaboration. Users can incorporate data from SAP and third-party enterprise resource planning (ERP) systems with dashboards based on the SAP Fiori user interface, allowing organizations to eliminate data silos and more efficiently implement corrective actions.



SAP remains committed to driving functionality developments across all of its products, including investments in machine learning enhancements to its predictive and decision recommendation capabilities. The solution also offers exception management and embedded collaborative capabilities to further promote the connections between supply chain planning and execution. The SAP Supply Chain Control Tower is designed to accommodate businesses of any size and complexity can help improve performance by developing supply chain processes. As the incumbent solution provider for many enterprise organizations, Nucleus expects SAP's investments in the newest iteration of its control tower solution to provide sufficient value for customers to update to the latest version.

## FACILITATORS

Facilitators in the 2019 Control Tower Technology Value Matrix are Elementum and LLamasoft.

### ELEMENTUM

Elementum is a Facilitator in the 2019 Control Tower Value Matrix. The vendor's core offering, Elementum Orchestration, is delivered as a software-as-a-service (SaaS) platform and allows users to proactively manage suppliers, logistics providers, manufacturing, product availability, and customer orders. The system captures and correlates external and internal data to give customers advanced notice of potential issues within their extended value chain. The vendor provides artificial intelligence technologies, including natural language processing, convolutional neural networks, and predictive analysis.

The Orchestration platform also includes the Elementum Product Graph, which assists customers in centralizing internal, partner, and global data to create a unified supply chain data view for cross-functional insights. User application of both the artificial intelligence features and the Product Graph drives operational efficiency for tasks like mapping global supply chain's connecting nodes and tracking shipment. Although the vendor has made strides to deliver a differentiated offering, additional investments in functionality and improvements to its existing automation capabilities should help the vendor's position in future editions of the Value Matrix.

### LLAMASOFT

LLamasoft is a Facilitator in this year's Control Tower Value Matrix. The vendor brings its expertise in supply chain design to the control tower space by providing visibility to customers, most often at a strategic level; however, LLamasoft has made strides since the

last Value Matrix with its Digital Design and Decision Center. Designed to function as an end-to-end digital twin of an enterprise's value chain, Digital Design and Decision Center has four key components: Data Hub, Visualizer, Modeler, and App Builder. The components work together to deliver visibility to customers with Visualizer, providing a variety of views and data displays based on the consolidated data reference model within the Data Hub. LLamasoft's control tower allows its customers to consider complex tradeoffs across policies guiding sourcing, manufacturing, distribution, inventory, and service. Instead of treating policies as hard constraints, LLamasoft allows organizations to relax these constraints and run scenarios to drive optimal cost to serve models.

Since the last Value Matrix, LLamasoft has adopted technology that incorporates in-memory, flexible databases to improve the scalability of its solution. LLamasoft has also taken steps to improve forecast accuracy through its AI-powered demand modelling by embedding demand patterns correlated with external causes such as gross domestic product, demographic shifts, weather, and currency exchange rates, among others that are served up to the user in the control tower. The result is that customers can better predict what will happen within their extended supply chains.

The vendor has also continued to push forward with its strategy to let customers develop micro-applications that fill a specific use case such as assisting with decision support. By bringing a unique approach to solving some of the most complex and challenging enterprise supply chain problems, LLamasoft fills an important niche in the market, giving customers an end-to-end view of their value chains at both a strategic and granular level. Nucleus expects that the innovation that LLamasoft is bringing to market will continue to deliver value to customers and improve its position in future editions of the Value Matrix.

## CORE PROVIDERS

Core Providers in the 2019 Control Tower Technology Value Matrix are MP Objects, ShipitSmarter and Viewlocity.

### MP OBJECTS

MP Objects is a Core Provider in the 2019 edition of the Control Tower Value Matrix. The vendor specializes in order management and provides visibility of each level of the order, from initial creation to completed delivery. To achieve visibility and control over each stage of an order, the MPO platform integrates with suppliers, repairers, warehouses, customs brokers, logistics providers, and field technicians, as well as the host of systems that customers already use as part of their execution system—such as enterprise resource

planning, and transportation and warehouse management. Users leverage MPO to manage each segment and sub-order to fulfill requirements of a customer's order including shipment orders, service orders, and work orders.

As part of the picture that MP Objects gives to customers, the platform can handle multiple transportation modes across providers and legs of the product's journey. The platform also captures cost-to-serve data, encompassing all logistics and ensuring rate compliance by partners. For industries where returns and repairs are common, MPO can manage all the inbound, interplant, and rebalance flows. Customers have real-time visibility of the status of each order, allowing them to act immediately when exceptions occur. By providing a single integrated platform on which all order management is consolidated, MPO fills a vital role for its customers. Nucleus expects the vendor to continue to make in-roads in the control tower market and improve its relative position in future editions of the Value Matrix.


## SHIPITSMARTER

ShipitSmarter is a Core Provider in the 2019 Control Tower Value Matrix. Delivering cloud-based software-as-a-service solutions, ShipitSmarter specializes in managing the entire shipment lifecycle, from order creation to financial settlement. Along the shipment lifecycle, the vendor delivers capabilities addressing system integration, carrier management, transportation management, freight audit, and financial management. ShipitSmarter prides itself on its independence from the carriers with which it works, helping customers achieve value by functioning as a strategic partner. As a best-of-breed vendor, ShipitSmarter delivers value to customers that are looking address their complex shipment management processes.

To help many of its customers prepare for Brexit, ShipitSmarter launched a test environment that enabled companies to model the potential impact on shipping with the most common carriers. In the test environment, the United Kingdom was setup as a Non-European Union country, therefore incurring the subsequent carrier charges. Customers were encouraged to perform scenario analyses, demonstrating how ShipitSmarter prioritizes its partnership with customers and looks to ensure their success. As a niche player in the overall control tower market, ShipitSmarter fills an important function that complements other areas of supply chain planning and execution. Further investment in extending the breadth of the solution should help improve its position in future editions of the Value Matrix.

## VIEWLOCITY

Viewlocity Technologies is a Core Provider in this year's edition of the Control Tower Value Matrix. All of Viewlocity's products are offered as SaaS, managed services, or license deployments. The vendor has a long history of delivering solutions focused on supply chain



visibility and control. The vendor focuses on several industries with its solutions, including automotive, aerospace, manufacturing, retail, high tech, consumer goods, and logistics. Viewlocity has a suite of solutions covering supply chain design, inventory and asset management, supply chain management, logistics and transportation, planning and production, order lifecycle management, and supplier management

Since Viewlocity was acquired by Fog Software Group, investments in Viewlocity's solutions have been minimal, with the controlling interests continuing to push the vendor's Control Tower Platform solution. Although it is able to service global customers, without further investment in new capabilities, the vendor will continue to lose ground relative to the rest of the market.