Quick Answer: End-to-End Supply Chain Control Towers Remain a Mystery, However There Are Paths to Take

Published 9 July 2020 - ID G00729366 - 13 min read

Christian Titze

Initiatives: Technology and Solutions for Supply Chain and Operations

Gartner has written research notes, compiled surveys, held solution briefings and led councils with supply chain teams to better gauge the understanding and adoption of control towers. While end-to-end control towers still remain a mystery for many supply chain leaders, there is a way forward.

Quick Answer

How are leading supply chain organizations approaching the request and necessity for end-to-end supply chain visibility and control?

- Supply chain control towers are still more functionally siloed in their setup, and do not provide the anticipated end-to-end (E2E) visibility, control, and decision-making support.
- Data lakes are only a partial answer as they allow deep functional analytical insights and visualization but limited dependency and impact analysis, and no intelligent E2E response.
- A digital supply chain twin and supply chain mapping are enabling factors that would lay the foundation to allow E2E supply chain visibility (SCV) and control.

More Detail

In May 2020, Gartner hosted a virtual peer roundtable for supply chain senior executives. The overall topic of this session was, “How to achieve the connected supply chain,” with one specific focus area on E2E visibility and orchestration (aka “control towers”).

For many organizations today, control towers are designed as war-room-like environments that are focused heavily on visualization and dashboards, but few are leveraged as analytics-driven, decision-support tools, representing huge gaps. The main key takeaways from the discussion among the participants were:

- First, the terms “control tower” and “connected supply chain” are hyped and overused.
- Many companies lack E2E visibility, process orchestration and aligned decision making. This is mostly still a vision that applies across many industries, although some are further along in maturity.
Many companies have Tier-1 visibility but very limited visibility in Tiers 2, 3, etc. Visibility should include all participants — upstream with suppliers, downstream with customers and in between with providers.

The real-time aspect of visibility is not necessarily everywhere. It is often punctual, for example, on an operational basis, but less on a strategic one.

Note: Real time is critical for respond planning. Respond planning must align with the tactical and strategic planning layers, in an appropriate way, to ensure agility and responsiveness.

Companies have islands of domain-specific control tower capabilities, such as in planning, logistics and transportation, or customer fulfillment — but these are not connected and integrated to create an E2E view.

Often, there is a desire for deployment but a lack of time, resources, process and governance in place to support the vision, next to a clear understanding and perception on how to build the business case.

Visibility is a necessary foundation and first step, but then there is a need for advanced deep analytics (predicting), providing scenario-based options for the next best action (prescriptive) and decision support to optimize the outcome (simulating and responding).

Note: Before you can do the prediction and prescription (which together equals decision making) you need to associate the data you get through visibility, you need to create a model of the supply chain upon which you can predict and prescribe.

Priorities should be given to data quality and integrity (keeping data updated, conclusive and also governed), the expansion outside “one’s own four walls,” then the scalability on a global basis — always having the vision in focus and “customer first” in mind.

Note: In addition, priority should be given to evolving the digital supply chain twin — can’t do anything E2E without this foundational capability.

Another big obstacle is the buy-in from all business partners providing data; brand owners all want that for optimizing their supply chains but, often, their partners do not want to become that transparent. The ability to build strong collaborative partnerships becomes a foundational requirement. It is imperative to democratize the data within the company.

Would a control tower really be the only thing companies need? Because there are a number of control tower offerings, even being implemented at a functional focus at many companies, but how to connect them to gain the anticipated E2E perspective remains open.
Supply Chain Control Towers Are Still More Functionally Siloed

Supply chain control towers are still more functionally siloed in their setup and do not provide the anticipated E2E insights, control and decision-making support.

The term “control tower” still means many things to many people, creating a recipe for confusion in the marketplace, making it difficult for buyers to select appropriate control-tower-type capabilities for their needs. Often technology-based control towers are seen in functions such as logistics and planning, sometimes called “command centers,” but not as often in procurement (see “Supply Chain Brief: Pandemic Reset — Jump-Start Your Supply Chain by Adopting a Control Tower Approach”). Accordingly, the approach isn’t technology-specific, but instead it’s more of a strategy to connect organizations, data, people and processes. The most common available vendor-promoted control towers are:

- A supply chain planning (SCP)-like control tower module as an integrated part of a core planning system. From the control tower you can jump directly into planning scenarios, make and carry out decisions, and follow up on these. Although many of these are now E2E in nature they may only address certain layers of the E2E decision making and typically not fully address all four capabilities of our configure, optimize, respond and execution visibility (CORE) decision-making model.

- A supply chain execution (SCE)-like control tower (with the major use case of logistics and transportation, see “Learning From Logistics Leaders: How to Structure, Organize and Derive Value From a Logistics Control Tower”) as an integrated module of an executional system. This would only allow siloed decision making, although that’s what the current market offers.

- Another SCE-like control tower (with the major use case of creating an order-to-cash hub, see “Video: Siemens — LIFE-Less Interfaces for Excellence: Order Management at Its Best”) where a
Current supply-chain-control-tower-type capabilities can yield efficiency gains and savings across the supply chain, impacting multiple business value drivers, including lowered cost of goods sold (COGS), selling, general and administrative (SG&A), and therefore increased operating profit (increased revenue and reduced cost), reduced capital expenditure and improved capital allocation. However, these benefits are severely impeded by the functional and/or domain focus of current control tower offerings. E2E SCV as a foundation will allow more intelligent decision making within the SCP domain (planning collaboration) or within SCE (executional insights), and ultimately leads to the convergence of SCP and SCE in support of the digital transformation. This would lead to continuously making higher-quality E2E decisions, a mechanism by which business value is created.

Peer insights: Gartner gathered many examples of functional control towers, available as research notes or videos. They address areas such as SCP, logistics and transportation, sourcing and procurement, or customer fulfillment and services.

Data Lakes Are Only a Partial Answer

Data lakes are only a partial answer as they allow deep functional and/or domain analytical insights and visualization, but limited dependency and impact analysis, and no intelligent E2E response.

Companies with a complex and diverse application architecture and landscape are often implementing data lakes with the desire to achieve E2E visibility and control (see “Data Hubs, Data Lakes and Data Warehouses: How They Differ and Are Used in Supply Chain”). Hereby, different data sources are leveraged, such as structured and unstructured data from internal and external systems, and then analytics are applied. However, the downside is that such data lakes create multiple versions without a “single version of the truth.” Data governance then makes you run in infinite circles to define what actually is “true and correct.” And when further applying analytics—or data science—it is without any association of the data into an E2E digital representation of the supply chain.

Definition: Data lakes provide an endpoint for collection of transactional, detailed data (and possibly other types of data), specifically to support the execution of analytic workloads in supply chain management. This means that various kinds of analytics can be run atop of them, accessing the data they hold to support analytic processing. As a result, data lakes have a
The intelligence layer within data lakes would provide analytics capabilities such as autogenerated visualizations, chatbot interfaces for natural language interactions, and text generation to explain trends and key findings in data — but only with the right rules and governance in place. However, sophisticated data science requires a separate toolset. Additionally, data lakes do not offer scenario planning and advanced collaboration features (such as annotations, print screen, sharing analysis via email, discussion threads for reports or screen sharing for live discussions; also they do not offer real-time collaboration or to identify and contact other users for the purposes of sharing, chatting about and annotating content) — all of which are needed for intelligent E2E decision making. Data lakes should also not be used for data integrity efforts or assumed as the true source for the one true data point.

**Peer insights:** Two companies, having built a network of functional-focused control towers, are now linking them through a central master data storage area, making this area available for data scientists and business analysts to experiment. Applying analytics and intelligence to find correlations, allowing to connect planning with execution, coming up with possible impact scenarios, and related and consequential recommendations. Yet, another company did create such a consolidated data lake but found it difficult to keep data updated and governed. It found that it had created a “data lake monster” with another company — having moved from a data lake to a data ocean, it is now actually facing a data swamp.

**Data collection:** Data lakes collect unrefined data and events captured from a diverse array of source systems, and support a generic set of analytics use cases (along activities of data preparation, exploratory analysis and data science activities). Unrefined data is data in its native form, with limited transformation and quality assurance, no association applied, as well as multiple versions of the truth for a data point. Events are captured from a diverse array of source systems such as public domains or social media.

**Governance:** While data lakes may also include governance controls (for example, they can provide monitoring and resolution of quality issues in inbound data), they support governance in a more reactive and “downstream” manner.

**Use case:** Data lakes usually support data cleansing and preparation, exploratory analysis, and data science activities (experimenting with data sources, is what Gartner refers to as Mode 2 in a bimodal approach) — potentially across a wide range of subjects and constituents. As a result, data lakes support highly variable semantics, a generic set of analytics use cases, and a range of different processing styles and approaches (including data discovery, machine learning and heavy batch computation).
So data lakes of course could provide visualization and standard analytics but not E2E visibility and insights for better decision making combined with capabilities of dependency and impact analysis for scenario modeling, ultimately suggesting an intelligent issue resolution and response, along with supply chain optimization.

A Digital Supply Chain Twin and Supply Chain Mapping Would Lay the Foundation

A digital supply chain twin and supply chain mapping are enabling factors that would lay the foundation to allow E2E supply chain visibility and control.

Businesses are looking for a capability that simulates preparedness and response to disruption, and provides insights into the E2E dependencies and impacts across units and partners; then acts on those insights so that decisions become actions. This represents the main characteristics Gartner references in its frameworks for SCV and E2E planning, to ultimately achieve supply chain convergence. The following are the main characteristics in Gartner's SCV framework:

- **SEE** — Get real-time or close to real-time visibility and clarity
- **UNDERSTAND** — Leverage and analyze signals from the digital ecosystem
- **ACT** — Intelligently optimize response for best outcome
- **LEARN** — Continuously learn from the above three steps

What is needed to move from visibility and/or visualization toward intelligent and optimized decision support is, therefore, a digital representation of the physical supply chain. This is what Gartner calls the “digital supply chain twin” (the aim would be to have a digital representation of the E2E supply chain, as of now, we see occurrences mainly in areas such as factory lines, warehouses or specific processes such as order to cash). The digital supply chain twin is built from granular data to form a dynamic, synchronized, real-time and time-phased representation of the various associations between the data objects and entities that ultimately describe and make up how the E2E physical supply chain integrates and operates.

All this requires the domains (such as visibility, planning, execution, fulfillment and analytics) to work together — all using this digital supply chain twin. This leads to that three-layer model of E2E visibility, E2E process orchestration, and E2E aligned decision making. This is the death of plan, source, make, deliver Supply Chain Operations Reference (SCOR) quite rightly, as we need to think in layers and stop thinking in terms of functional and/or domain.
To facilitate the alignment and automation of their decision making, companies are beginning to recognize the importance of having a single digital representation of their E2E supply chain, a, so to say, “map” reflecting the reality. This not only represents the internal operations but all tiers, including the ecosystem partners’ too (for example, upstream, downstream and service providers). Organizations would use a digital supply chain twin for optimization on all levels of supply chain decision making, from strategic to executional. Appropriate predictive and prescriptive analytics, including machine learning, artificial intelligence and artificial neural networks, would be applied to the digital supply chain twin, enabling aligned (and to various degrees automatic) decisions to be made. By being a truer representation of the real-world physical supply chain, these decisions would be faster and of a higher quality.

A software occurrence where this concept is started to be applied is an advanced planning solution or a multienterprise supply chain business network with planning capabilities included (see “Magic Quadrant for Multienterprise Supply Chain Business Networks”). If fully erected, properly configured and comprehensively used, such a cohesive platform could provide the anticipated digital supply chain twin as a foundation.

It is through this twin that a company can drive the alignment of its decisions, both horizontally and vertically, for augmented agility and efficacy. This alignment is key in the effort to significantly improve decision making and the associated business value. It supports deciding how to change some of these relationships, for example, push an order through an alternative route in the supply chain, look for alternative sources of supply or additional shifts in production if demand increases, or build a new warehouse to better satisfy customer needs. Some of these decisions can be fully automated (typically, the shorter-term ones). Ultimately, it creates E2E visibility and supports E2E decision making by being in lockstep with the real-world supply chain. Through this linkage to the real world, situational awareness, optimized supply chain decision making and dynamic risk management are greatly enhanced.

**Recommended by the Authors**

“Research Brief: Remove the Clouds of Confusion When Shopping for a Supply Chain Control Tower”

“Don’t Believe the Control Tower Hype — Buyer Beware”

“Supply Chain Brief: Pandemic Reset — Jump-Start Your Supply Chain by Adopting a Control Tower Approach”

“Video: Logitech — Control Tower Evolution”

“Video: Schneider Electric Logistics Control Towers Best Practice Story”

“Microsoft Devices Supply Chain — From a Global Control Tower to a Fulfillment and Logistics Nerve Center”
“How a Detailed Plan Makes the Control Tower Work”

“How to Use a Control Tower in the Digital Supply Chain”

“How to Use Technology to Increase International Visibility in Times of Crisis”

“Mastering Uncertainty: The Rise of Resilient Supply Chain Planning”

“How to Use Technology to Increase International Visibility in Times of Crisis”

Recommended For You

Quality Design Drift Metric (Kimberly-Clark)

Design Quality Metric Library

Quality Design Robustness Metric (Nexteer)

Quality Design Innovation Index — Metric Only (LevelSun)

Quality Design Change Categorization (Cubic Corporation)

© 2020 Gartner, Inc. and/or its affiliates. All rights reserved. Gartner is a registered trademark of Gartner, Inc. and its affiliates. This publication may not be reproduced or distributed in any form without Gartner's prior written permission. It consists of the opinions of Gartner's research organization, which should not be construed as statements of fact. While the information contained in this publication has been obtained from sources believed to be reliable, Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information. Although Gartner research may address legal and financial issues, Gartner does not provide legal or investment advice and its research should not be construed or used as such. Your access and use of this publication are governed by Gartner's Usage Policy. Gartner prides itself on its reputation for independence and objectivity. Its research is produced independently by its research organization without input or influence from any third party. For further information, see "Guiding Principles on Independence and Objectivity."