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Prepare for Takeoff with a Supply Chain Control Tower

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Supply chain managers are facing unprecedented challenges from the complexity of today's supply chains and the volatility of the global business environment.

The difficulties of managing supply chains in these circumstances continue to have a massive impact on companies' financials: US inventory levels, for example, have grown from about $400B to almost $640B in the last decade, outpacing GDP by more than 2x despite severe contraction during the recent prolonged recession[1]; global transportation costs, which already exceed $3.5 trillion (about 6% of global GDP and 20% of global merchandise trade), are expected to continue growing by 8–9% per year, far outpacing global GDP growth[2]; and out-of-stock percentages at retailers, spare part stores, and on manufacturing floors continue to create headaches for demand and supply planners.

In addition, supply chain executives now face new demands to manage the profitability of the supply chain, become more nimble and flexible, manage supply chain security and risk, meet increasing customer requirements, and support growth opportunities.

Although these challenges and demands can seem overwhelming, supply chain executives understand the strategies needed to meet them: horizontal, end-to-end supply chain collaboration; effective centralized talent and organizational alignment; and dynamic decision making and increased agility. Historically these supply chain strategies have proven difficult to execute due to the lack of a coherent source of data, analysis that took days to complete, and functional silos within organizations that hindered swift and effective resolution of issues.

Today, however, the penetration of supply chain technology like ERP, the advent of cloud-based computing, and the development of powerful data analytics have made it possible to execute the strategies required for supply chain leadership. In this paper, we will discuss how a supply chain control tower enables execution of these advanced strategies and explore specific actions companies can take to leverage a control tower for competitive advantage.

Enabling technologies for supply chain control towers

In the past, lack of the right technology has been a key factor impeding the execution of the supply chain strategies of horizontal, end-to-end supply chain collaboration, effective centralized talent and organizational alignment, and dynamic decision making and increased agility. Fortunately, new technologies and service providers now make it possible for companies to turn their supply chains into the end-to-end business operating strategies needed to meet today's challenges and demands. Three technological advances, in particular, are enabling this development:

- **Critical mass of supply chain technology:**
  The majority of any company's major supply chain partners are enabled with supply chain technology: ERP, planning and optimization, transportation and warehouse management, etc. This makes available a wealth of data about operations along the end-to-end supply chain.

- **Connecting through the cloud:**
  New technologies have emerged that allow all the nodes along the end-to-end supply chain to be connected, regardless of the underlying execution platform. These cloud-based technologies are dramatically reducing the cost, complexity, and time-to-value of inter-enterprise integration.

- **Managing enormous amounts of data:**
  Advances in analytics are enabling organizations to make use of the enormous amount of data being collected and connected across the supply chain.

What is a supply chain control tower and how does it work?

Simply stated, a supply chain control tower is a shared service center that monitors and directs activities across the end-to-end supply chain to make it collaborative, aligned, agile, and demand-driven. A control tower acts as a centralized hub that uses real-time data from a company's existing, integrated data management and transactional systems to integrate processes and tools across the end-to-end supply chain and drive business outcomes. Consider these examples of how leading companies are using control towers for competitive advantage:

- Unilever has set up a control tower to provide visibility and management control for its multiple transport movements across Europe. It is now able to offer better customer service at lower cost and with lower carbon emissions.[3]

- Pfizer's transportation control tower platform enables the company to measure the flow of product, orders, and shipments to establish ongoing indicators of actual supply chain behavior.[4]

- Dell's global command centers coordinate parts, logistics, and field technicians to respond swiftly to customers' requests.[5]

Although control towers are sometimes defined only in terms of providing visibility and generating alerts to enable reactive response, a supply chain control tower, as Accenture defines it, has three essential capabilities for managing complex supply chains end-to-end—not just visibility but also analytics and execution (Figure 1):

Visibility

Real-time access to information from across the end-to-end supply chain—information about, for example, demand, capacity (supplier, manufacturing, distribution), orders, inventory, and shipments—can enable supply chain managers to answer the question "What is happening now?" This end-to-end visibility in a control tower is provided by built-for-purpose technologies leveraging a single-page information model, milestone modeling, master data management, and dashboards and alarms.

Analytics

Powerful analytics tools, including predictive analytics, can enable supply chain managers to answer questions such as "Why is this happening?," "What can happen next?," and "How can we improve?" Supply chain control towers are equipped with analytics to help answer these questions and target value opportunities by making sense of the visibility data (conducting root cause analysis, triggering alerts, detecting "tipping points," and initiating action), performing "what if" analysis of scenarios, and engaging in risk analysis and response management.
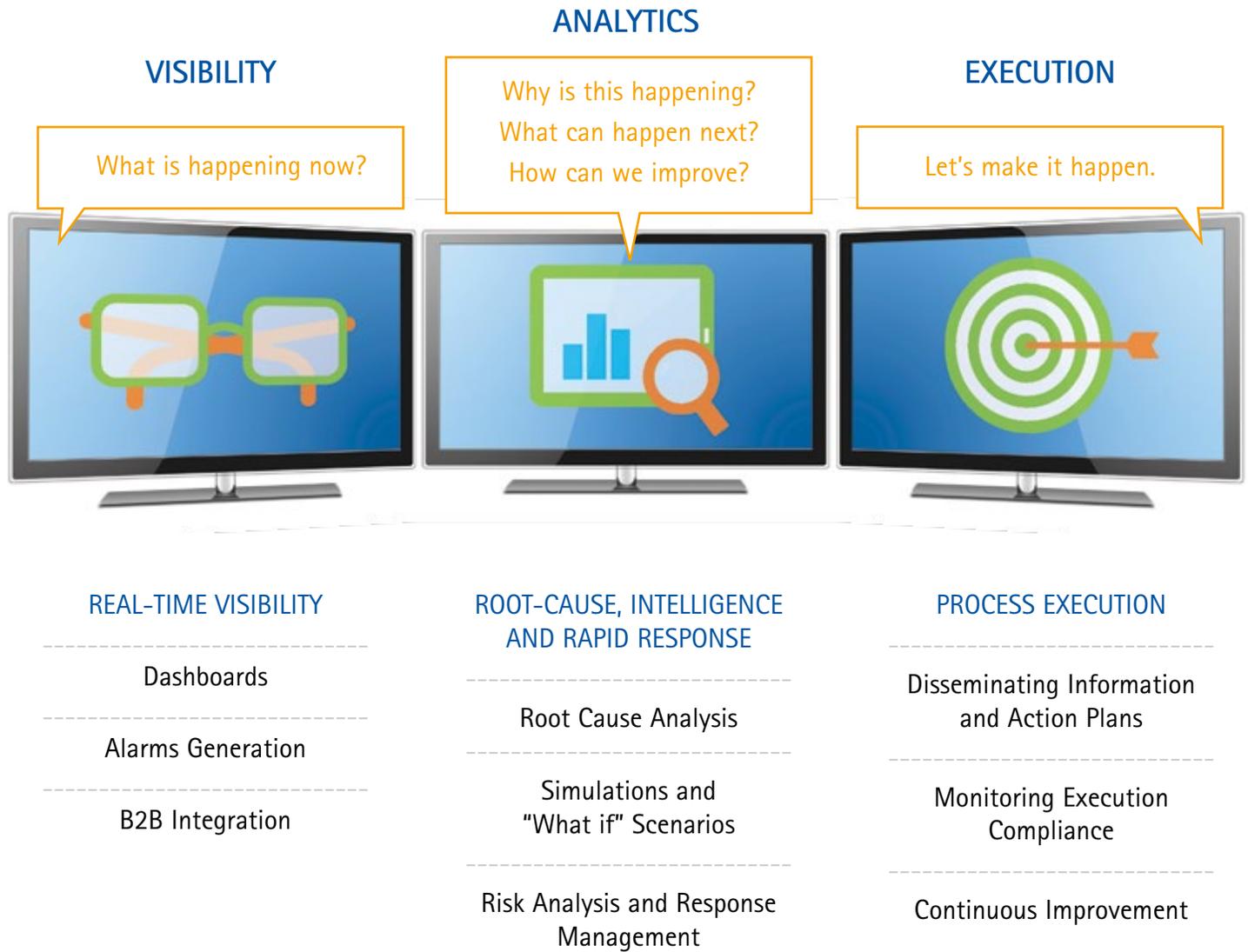
Execution

Streamlined processes—for tasks such as planning, materials management, fulfillment, distribution, and service—enable supply chain managers to orchestrate the dissemination of information and action plans across the supply chain and then monitor activity to help ensure compliance. This is a very powerful tool, particularly for an organization with a number of shared service centers delivering transactional services to multiple divisions and business units. The control tower helps ensure that each part of the supply chain knows when and how it will be impacted by another, and the monitoring of activity helps to enable continuous improvement.

In defining a control tower it is also important to understand what it is not. A control tower is not a replacement for transactional and data management systems. It is not just a visualization portal on top of a data warehouse, since a control tower has analytics capabilities; nor is it just an in-memory processing system. Although it provides visibility into trading partners, a control tower, finally, is not a tool for use with 3PL or 3PSCM. All of these ideas capture only part of what a control tower can do for a business.

Figure 1. The three essential capabilities of a control tower

ANALYTICS

VISIBILITY

EXECUTION

What is happening now?

Why is this happening?
What can happen next?
How can we improve?

Let's make it happen.

REAL-TIME VISIBILITY

Dashboards

Alarms Generation

B2B Integration

ROOT-CAUSE, INTELLIGENCE AND RAPID RESPONSE

Root Cause Analysis

Simulations and "What if" Scenarios

Risk Analysis and Response Management

PROCESS EXECUTION

Disseminating Information and Action Plans

Monitoring Execution Compliance

Continuous Improvement

Control towers in action

Supply chain control towers can take different forms in terms of functional footprint and scope of control. They can be built to drive specific business outcomes, then evolve over time to address additional issues and take the supply chain organization to whole new levels of maturity and performance. Here are three illustrative examples of control towers being used to bring about particular business outcomes:

Achieving Functional Excellence

A chemical company uses a supply chain control tower to achieve functional excellence. Having reached a performance ceiling in its basic supply chain functions, the company implemented a control tower to centralize the front and back ends of
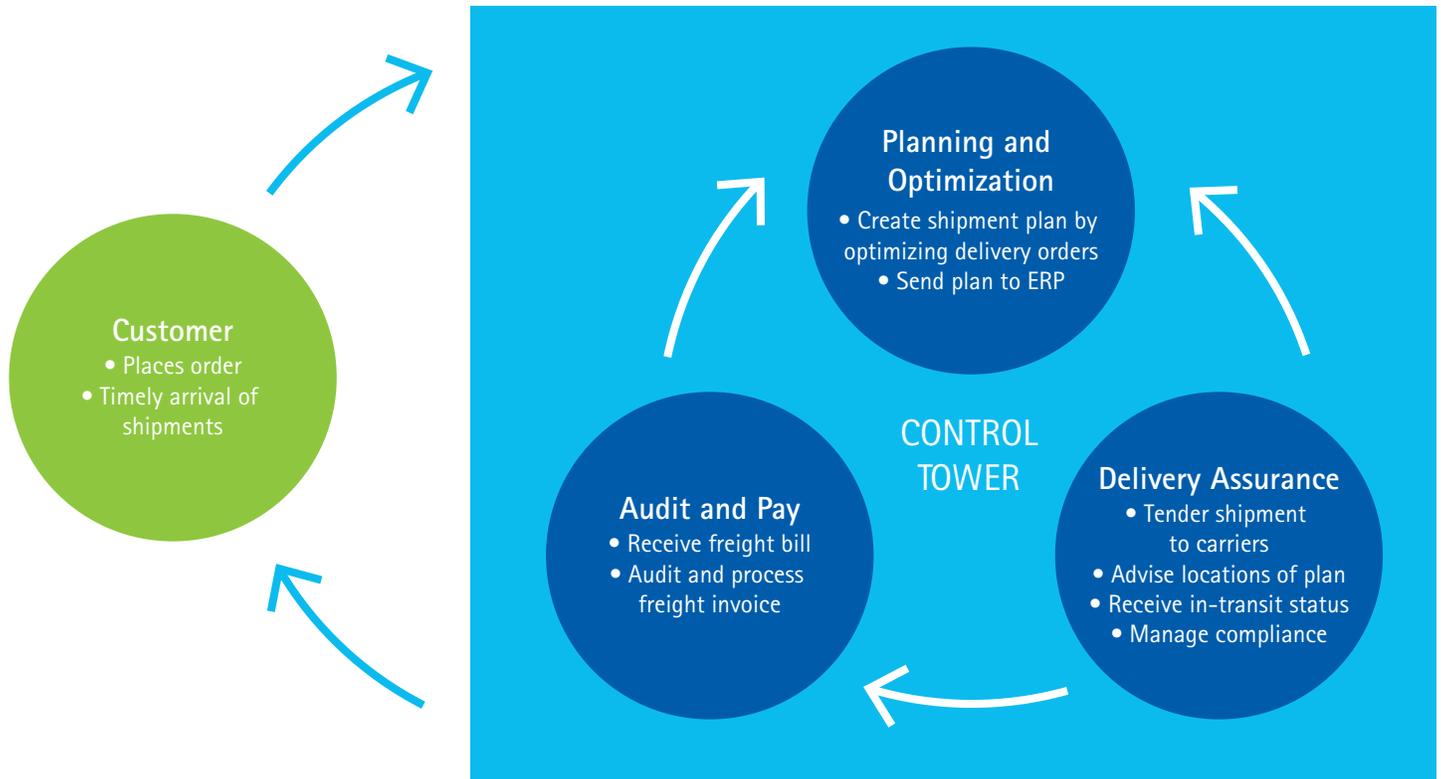
the order fulfillment process and optimize performance in the key functional metrics of transportation utilization, cost, and on-time delivery (Figure 2).

When a customer places an order, the company's ERP system generates outbound delivery orders. Yet instead of these being routed to local transportation planners at each site, the transport planning is performed by a group inside the control tower. Staffed by a team of dedicated planners with deep expertise and years of experience who are equipped with advanced analytics capabilities, the control tower creates a shipment plan by optimizing delivery orders (consolidating, routing, and assigning a carrier) and sends the plan to ERP. The control tower then tenders the shipments to carriers and advises each location of its plan.

Once the carriers pick up their loads, the control tower provides continued visibility, monitoring order delivery by receiving in-transit status messages from each carrier to manage compliance and help ensure timely arrival of shipments—something the company would never have been able to do without a control tower. Finally, once the carrier submits the freight bill, the control tower oversees the audit, dispute resolution, and payment processes in an off-shore shared service center.

With a control tower, this company can realize 10–20 percent savings in its outbound transportation spend from a combination of delivery optimization and improved efficiency and accuracy in the audit/payment process.

Figure 2. Achieving functional excellence

Customer
• Places order
• Timely arrival of shipments

CONTROL TOWER

Planning and Optimization
• Create shipment plan by optimizing delivery orders
• Send plan to ERP

Delivery Assurance
• Tender shipment to carriers
• Advise locations of plan
• Receive in-transit status
• Manage compliance

Audit and Pay
• Receive freight bill
• Audit and process freight invoice

Enabling Rapid Response

An electronics manufacturer uses a supply chain control tower to enable rapid response. This company has six distribution centers across North America that ship directly to customers' retail stores. With its major manufacturing operations and suppliers based in Asia, the company needs near-real-time information on suppliers' inventory positions and production plans to respond quickly to supply chain volatility and minimize revenue risks (Figure 3).

The company's supply chain control tower provides visibility by generating alerts about expected shortfalls and delays in production runs a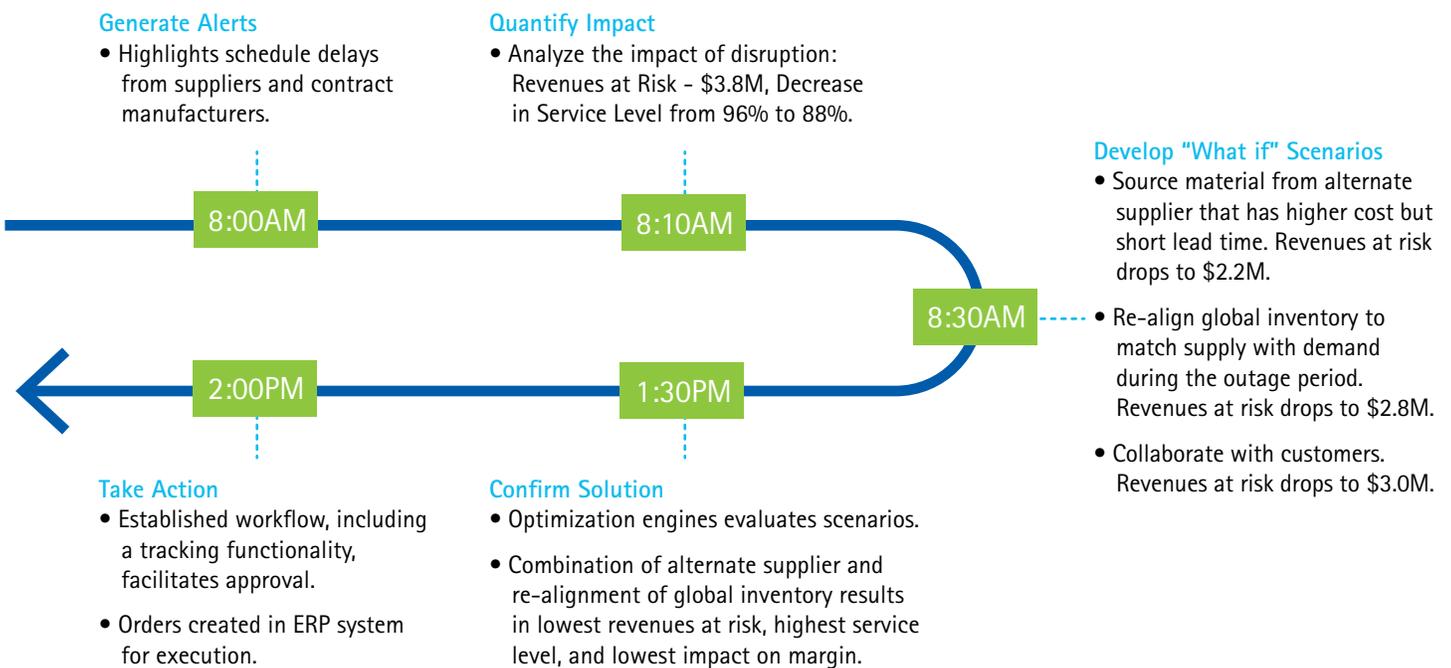t suppliers and contract manufacturers and the cascading impact these events will have on its own supply plans and production schedules. The control tower's analytics and scenario-modeling capabilities can then determine the potential impact on, for example, revenues, service levels, and margins, and generate "What if?" scenarios such as sourcing from alternate suppliers, realigning global inventory, modifying production schedules, or collaborating with customers to mitigate the effects of a delay. Optimization engines evaluate the various scenarios and combinations of scenarios to enable selection of the best one. An established workflow then facilitates the approval process so that orders can be created in the ERP system for execution.

Without a control tower, this company would likely not know about suppliers' inability to fulfill purchase orders until they failed to arrive on time, and would then scramble to assemble a SWAT team to do damage control and perform a backwards-looking root-cause analysis. With the end-to-end visibility and advanced analytics of a control tower, it is able to proactively identify potential issues and choose the best options for mitigating disruptions.

A control tower can enable this company to realize a 10–25 percent improvement in plan adherence and a 5–10 percent improvement in on-time delivery performance, reducing at-risk revenue (i.e., from orders cancelled due to missed dates) by up to 50 percent.

Figure 3. Enabling rapid response.

CONTROL TOWER

Generate Alerts
- Highlights schedule delays from suppliers and contract manufacturers.

Quantify Impact
- Analyze the impact of disruption: Revenues at Risk - $3.8M, Decrease in Service Level from 96% to 88%.

Develop "What if" Scenarios
- Source material from alternate supplier that has higher cost but short lead time. Revenues at risk drops to $2.2M.
- Re-align global inventory to match supply with demand during the outage period. Revenues at risk drops to $2.8M.
- Collaborate with customers. Revenues at risk drops to $3.0M.

8:00AM → 8:10AM → 8:30AM

2:00PM ← 1:30PM

Take Action
- Established workflow, including a tracking functionality, facilitates approval.
- Orders created in ERP system for execution.

Confirm Solution
- Optimization engines evaluates scenarios.
- Combination of alternate supplier and re-alignment of global inventory results in lowest revenues at risk, highest service level, and lowest impact on margin.

Driving Business Strategy

A US consumer goods company uses a supply chain control tower to drive business strategy. The company supplies its products to customers located mainly on the East and West Coasts. After the CFO highlights a decline in profits over a few months in which overall costs have increased and revenues remained stagnant, control tower reports show logistics costs rising and on-time-delivery slipping in the eastern region. A control tower analytics team conducts a thorough analysis and comes up with an action plan for network and inventory optimization (Figure 4).

First, a logistics dashboard in the control tower highlights transportation as the major contributor to increasing overall logistics costs, with poor performance in transportation and distribution planning, sub-optimal product flow, and inefficient network routes as key contributors. Plummeting service levels for on-time delivery are another area of concern.
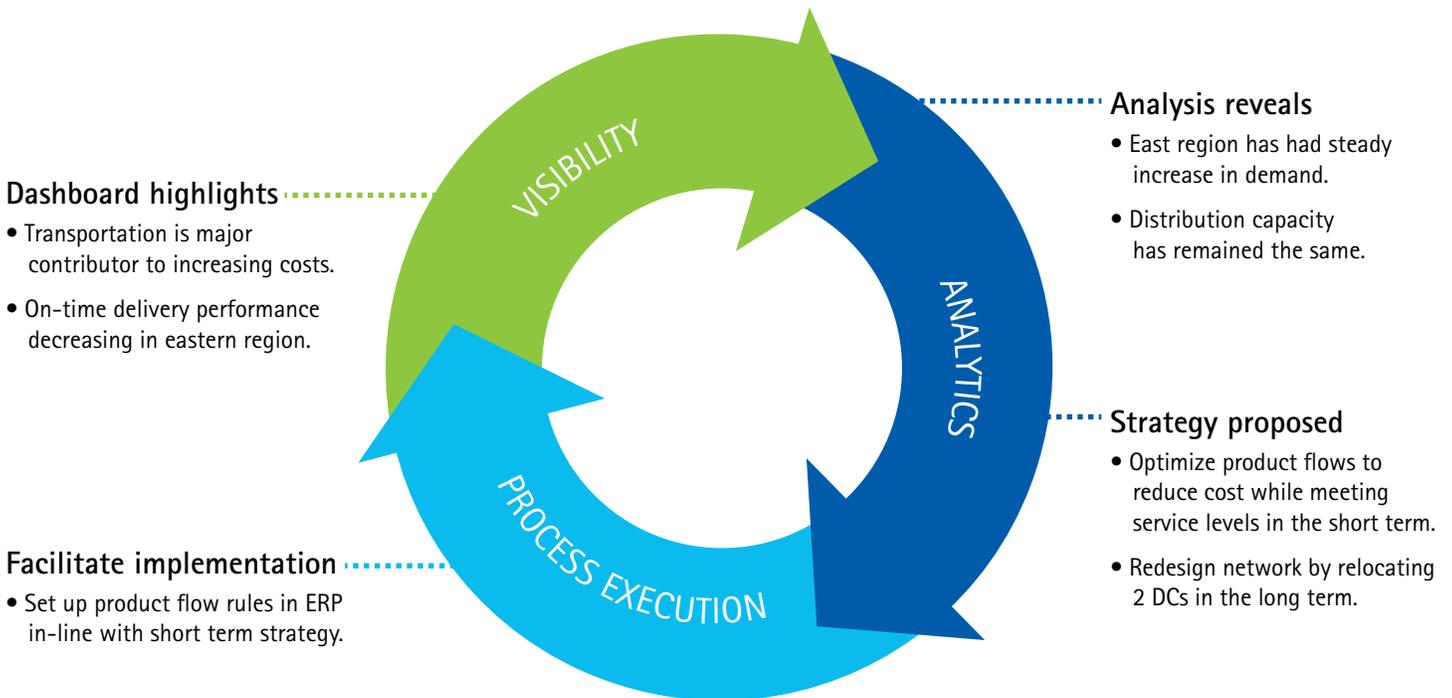
Deep-dive analytics then shows that the eastern region has witnessed a steady increase in demand while its distribution capacity has remained the same. The control tower team suggests both a short-term strategy (optimizing product flows to reduce overall transportation costs while meeting service-level targets) and a long-term, greenfield strategy (redesigning the network to shut down two existing West Coast distribution centers and open two new ones in the eastern region). Both optimization scenarios result in significant cost reduction and increased service levels. The control tower then facilitates process execution by setting up product-flow rules in the ERP system in line with the short-term strategy.

Before this company established its control tower, this type of analysis would have been handled as a one-off project, requiring months to assemble a team, build the necessary skills, select and source a tool to perform the analysis, and gather large amounts of data to analyze. With the control tower in place, the skills, processes, tools, and data are at hand and the analysis is performed in a fraction of the time.

A control tower can enable such a company to realize a 5–10 percent improvement in on-time delivery performance and/or a 10–20 percent reduction in distribution costs.

Figure 4. Driving Business Strategy

Dashboard highlights
- Transportation is major contributor to increasing costs.
- On-time delivery performance decreasing in eastern region.

Facilitate implementation
- Set up product flow rules in ERP in-line with short term strategy.

VISIBILITY

ANALYTICS

PROCESS EXECUTION

Analysis reveals
- East region has had steady increase in demand.
- Distribution capacity has remained the same.

Strategy proposed
- Optimize product flows to reduce cost while meeting service levels in the short term.
- Redesign network by relocating 2 DCs in the long term.

Building a supply chain control tower: the future is getting closer

The barriers to establishing supply chain control towers have historically been high and difficult to overcome, as control towers require capital expenditures for both technology and facilities, and complex integration efforts for both information and supplier systems. But research from a recent Accenture study on risk management has revealed that leaders are investing aggressively in risk management capabilities, with a specific focus on end-to-end supply chain visibility and analytics such as found in control towers, and believe they will see a substantial return on their investment. And while control towers do require some up-front investment, several recent developments are now greatly reducing the time-to-value from the decision to build a supply chain control tower.

Cloud-based technologies and software-as-a-service licensing models, for one thing, are reducing the capex investment and simplifying integration efforts. As more companies build control towers, more and more suppliers and partners are onboarded to relevant technology platforms, which simplifies the effort to onboard suppliers for companies newly implementing their own control towers. Companies can also take advantage of third-party providers who can perform some or all of the necessary functions "as a service"—both in the upfront design and setup of a control tower and in the day-to-day operation.

Establishing a control tower is a journey that must be guided by a clear understanding of where the real value-creation opportunities lie. The journey begins with an understanding of where you are underperforming in your supply chain, where the opportunities to improve performance are, and which of these opportunities can give you the greatest value in the short, medium, and long terms.

When building a supply chain control tower for the first time it is a good idea to begin with a limited scope in order to prove the concept and generate momentum. A leading consumer goods manufacturer, for example, decided to get started by designing a control tower to reduce end-to-end cost to serve in a single product line serving just one market region. When the company met its target of a 15% cost reduction in inbound logistics, manufacturing, distribution, and inventory, it then rolled its control tower out to the rest of its global business.

Control towers of the kind we have described are a relatively new concept, but they are already demonstrating their value in helping to solve some of the most vexing challenges facing supply chain managers today. End-to-end supply chain alignment, collaboration, and orchestration, and the ability to use real-time information to respond with quickness and agility to unexpected events—these are indispensable capabilities for supply chain leadership today. Given these requirements, we believe that one of the most powerful tools there is for boosting overall supply chain performance and maximizing the value the supply chain delivers to the business is a supply chain control tower.

Four questions to ask before starting to build a supply chain control tower

These four questions will help you start to determine if a control tower would drive value for your organization.

- Where are you underperforming in your supply chain—and where are the opportunities to improve that performance with the capabilities of a control tower? It may be, for example, high costs of transportation and logistics; declining service levels and fill rates; difficulty matching supply and demand and poor inventory; or lack of material availability due to unreliable/ unpredictable supplier shipments.

- Which of those opportunities give you the greatest value—in the short, medium, and long terms? Ideally you want to focus on where you can make the biggest impact in the shortest time.

- How does your organization need to change to enable a control tower? A control tower will require lines of responsibility to enable decisions to be made and implemented quickly. Consider which roles in your current organization will need to be rolled into the control tower.

- Where can you begin, and where do you need to end up? Develop a high-level roadmap of how you will get there. Implementing a control tower doesn't need to be a single 'big bang' proposition. A 'land and expand' approach helps get to benefits early and mitigates the risk of too much change too fast.

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