Capgemini

Cognitive control towers

How consumer-products organizations can improve stability and resiliency through dynamic control-tower capabilities

Maintaining visibility across evolving and expanding intelligent supply networks is an increasingly complex task for consumer-products organizations. Where once brands could manually track the flow of materials and goods along a defined course with a limited number of partners, organizations must now monitor, manage, and analyze activity across a vast, decentralized supplier ecosystem.

Perhaps more importantly, with disruption and uncertainty at an all-time high, consumer-products organizations must find ways to translate current visibility into future value. In today's environment, there is relatively little merit in explaining the past or even understanding the present. It is only in focusing on the future – by predicting and proactively addressing delays, risks, or other potential destabilizing events – that organizations can create a stable and resilient supply network.

The cognitive control tower is a next-generation coordination and management capability that unites people, processes, and technologies to create a 360-degree view of intelligent supply networks. Digital by design, this capability leverages data analysis, predictive modeling, and automation to guide decision-making, identify challenges, and proactively respond to risks and issues.

In this paper, the third in our five-part series about enabling intelligent supply networks for consumer-products organizations, we discuss the value of cognitive control towers and how brands can begin to build this capability today to enable a stronger, more resilient tomorrow.

Read our full intelligent supply networks series

Part one: *The death of the supply chain*

Part two: *Continuous, touchless planning*

What is a cognitive control tower?

The cognitive control tower is a digital hub that brings together people, processes, and technologies to create a 360-degree view of an intelligent supply network, enable data-driven decision-making, identify challenges, and proactively respond to risks.

Part one: Visibility and predictability, as enabled through cognitive control towers

Once a rigid, linear flow, today's supply chain is not a chain at all but rather a flexible, evolving ecosystem – one that engages a vast, decentralized network of partners to enable new levels of speed, choice, transparency, and personalization. To manage this next-generation intelligent supply network, organizations require a comprehensive view of it, including internal and external partners, as well as the ability to identify risks, challenges, and opportunities.

> **The cognitive control tower is a dynamic capability. It is not just about figuring out what is happening in the moment but also predicting what may occur in the future – and how the business should respond.**
>
> **Sebastien Neyme,** Principal / Director Supply Chain at Capgemini Invent

For the modern consumer-products company, a next-generation cognitive control tower is more than a logistical tool. It is a crucial link between the supply-ecosystem strategy and day-to-day operations. Drawing data from across the organization, this capability creates a complete view of the supply network, its performance, health, and viability. By extension, the cognitive control tower is a forward-looking capability, leveraging data-driven insights and cognitive technologies to enable better decision-making, predict future events, and automate responses to emerging challenges and opportunities.

For example, advanced analytics can identify patterns in data from across partners to identify shifts in purchasing behavior or predict supply disruptions. Using a combination of intelligent automation solutions, such as artificial intelligence (AI), machine learning (ML), or robotic processing automation (RPA), it is possible to partially or even fully automate responses to these events.

The cognitive control tower can help CP organizations "streamline operations, increase productivity, and mitigate risk at a time when the business is most vulnerable.

Wouter van Wijngaarden, Senior Manager, Supply Chain Management

Beyond helping consumer-products organizations manage supply-side challenges in the current environment, the cognitive control tower will also be instrumental in addressing the growing trends of personalization, convenience, and choice, which require significant manual processing at present. For example, automation enabled by underlying data analysis and predictive modeling capabilities can help organizations manage the explosive demand for customized products with sufficient granularity. This capability will also enable a variety of fulfillment methods, including subscriptions and direct-to-consumer channels, which often require significant last-mile delivery considerations. Finally, the cognitive control tower addresses consumers' growing desire for transparency by helping the organization trace the origin of products and materials, as well as their movement throughout the intelligent supply networks.

Cognitive control towers enable:

- Real-time visibility
- 360-degree supply networks view
- Future-looking business insights
- Data-driven decision making.

Creating data-driven insights with cognitive control towers

Business challenges	Insights through CCT	Actions	Maturity
1. Unreliable carrier billing	Insight in build-up carrier costs	Self-billing, eliminating need for the carrier to bill	Visibility
2. Customer dissatisfaction	Order tracking	Order prioritization	Predictive
3. Raw material production disruption	Insight into alternative sourcing locations	Recommended alternative source	Intelligent operations
4. Frequent late shipments	Insight into potential delays due to bad weather	Active re-routing of shipments	Intelligent operations
5. Frequent stock outs in stores	Insight into regional or local stock and demand	Order fulfillment from another DC. Next-best option automatically selected and executed	Smart decisions

Cognitive – and interconnected – control towers

While the goal of the cognitive control tower is to provide a comprehensive view of the organization, it is important to note that the function is not singular in nature. The expansiveness and complexity of modern supply networks is nearly impossible to capture or coordinate through a single tower.

To illustrate this concept, consider the structure and operation of an air-traffic-control system. This coordinated, integrated network ensures the safe and efficient passage of aircraft by standardizing technologies, processes, and outputs from individual towers to create a master view of the surrounding airspace.

Similar to the air-traffic system, the cognitive control tower capability for consumer-products organizations will not be enabled by a single tower, but an integrated network. Within this system, each tower is organized by one specific attribute – typically a geography, function, or industry – and then connected to other towers. It is in integrating these towers that the organization can create a multidimensional and comprehensive overview of the entire supply network.

"At this point, there is relatively little value in creating one control tower that provides an end-to-end view of the entire intelligent supply network," explains Jörg Junghanns, Vice President Europe, Digital Supply Chain, Capgemini. *"Even if the capability could be designed, it may not be any more efficient or effective than integrating two or more towers to accomplish the same task."*

Bringing together people, processes, and technologies through cognitive control towers

While data and digital capabilities are critical enablers of the cognitive control tower, effective operation requires the organization to align people, processes, and technologies in service to the broader intelligent supply network strategy.

1. People

The cognitive control tower may be digital at its core, but people are still very much at the heart of the capability. As in any transformation initiative, communicating the organization's vision and goals is crucial, as is establishing an organizational culture that embraces this new way of working. To be effective, people must be encouraged to communicate and engage in a way that reinforces the standardization of technologies and processes; they must speak the same language when it comes to numbers and data.

An equally important consideration is how the organization will enable an augmented workforce, one that blends humans with intelligent automation applications and cognitive technologies to streamline operations and increase productivity. For example, one of our clients automated both sales order and delivery note creation, which helped reduce processing time for typical orders and allowed staff to focus on exception handling. In another project, we helped a client increase forecast accuracy through demand sensing, which in turn boosts planner efficiency by 20 percent, effectively saving hours each day that could then be applied to higher-value activities.

"Enabling the full potential of the cognitive control tower will require an augmented workforce," explains Junghanns. "*This capability provides a prime example of how technology will not replace people, but simply make them more effective at their jobs."*

2. Processes

To create a next-generation cognitive control tower, the organization must update processes to accommodate a larger number of partners and enable the complex operations needed to deliver speed, personalization, and a variety of fulfillment channels. It will also be necessary to connect the processes from one portion of the supply ecosystem to the next, fostering collaboration and continuity throughout the business. Finally, the business will need to standardize operations across different partners so that the information relayed back to the tower is consistent in its meaning and implication. By creating this process pathway, the organization follows a set course – incorporating alerts and signals to keep the system running smoothly and allowing it to course correct when it does not.

As noted earlier, many aspects of these processes can be simplified or automated through AI or other intelligent-automation capabilities. For example, RPA with intelligent automation may enable low-touch or no-touch processing for recurring or manual tasks. Predictive analytics can help cull the number of solutions to an urgent issue to two or three options, saving planners' time and helping the organization optimize operations.

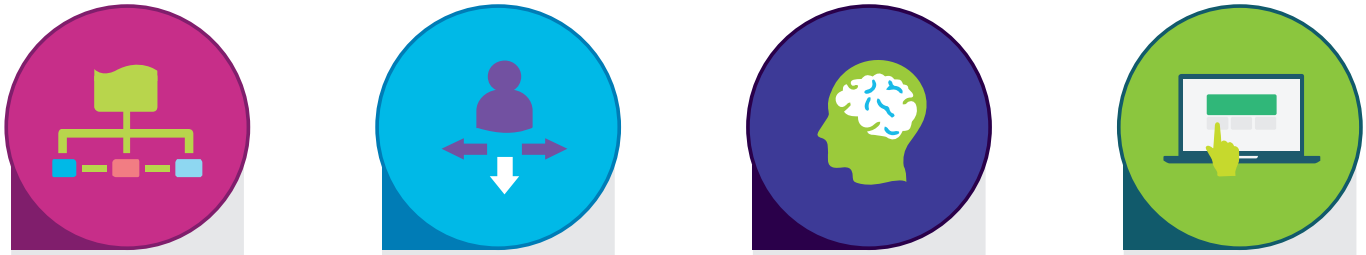
3. Technology

The cognitive control tower is digital at its core. At the same time, the performance of the supplier ecosystem depends on the maturity of individual members as well as their level of integration. To enable the cognitive control tower, it is necessary for software systems and applications to be harmonized and standardized. The network must also be consistent in how it collects, stores, and analyzes data, and ensure that the data is timely, accurate, and of high quality at the outset.

"Companies have a great deal of information but need to enrich the data and connect it across the network," explains van Wijngaarden. *"The cognitive control tower serves as a digital hub that takes in information from all partners and then disseminates insights back to the business."*

Finally, organizations must ensure that the technology stack is built in a way that can support the use of advanced analytics tools and intelligent-automation solutions. As noted above, AI, ML, RPA, and other technologies will be instrumental in refining processes and reimagining the workforce. As such, a holistic technology solution is needed to unite these three cognitive-tower components.

Building cognitive control towers



Connected data hub

- Consumes internal/external data
- Consolidates and creates common view
- Real-time visibility across entire network

Smart decisions

- Evaluate scenarios
- Prescriptive recommendations
- Automated decision making

Intelligent insights

- Real-time proactive alerts
- Root-cause analysis
- Predictive analytics incorporating network deficiency modelling

Intuitive UX

- Personalized and contextualized dashboards
- Accessible anytime, anywhere and on any device
- Controlled open access

Part Two: Capgemini's capability with cognitive control towers

Capgemini works with consumer-products organizations to develop and execute a comprehensive control-tower strategy and solution. Our team consists of business strategists, technologists, and operations specialists who work in concert to help the organization define, deliver, and run this important capability.

"What's unique about Capgemini is that we provide true end-to-end support," explains Neyme. *"As platform-agnostic strategists, we can identify the right solution; as technologists we can implement and integrate the system; as operations specialists, we can help build, manage, and run the cognitive control tower."*

"The operation of this capability is sometimes overlooked," admits Junghanns. *"At the end of the day, the effectiveness of the control tower boils down to how you manage the solution."*

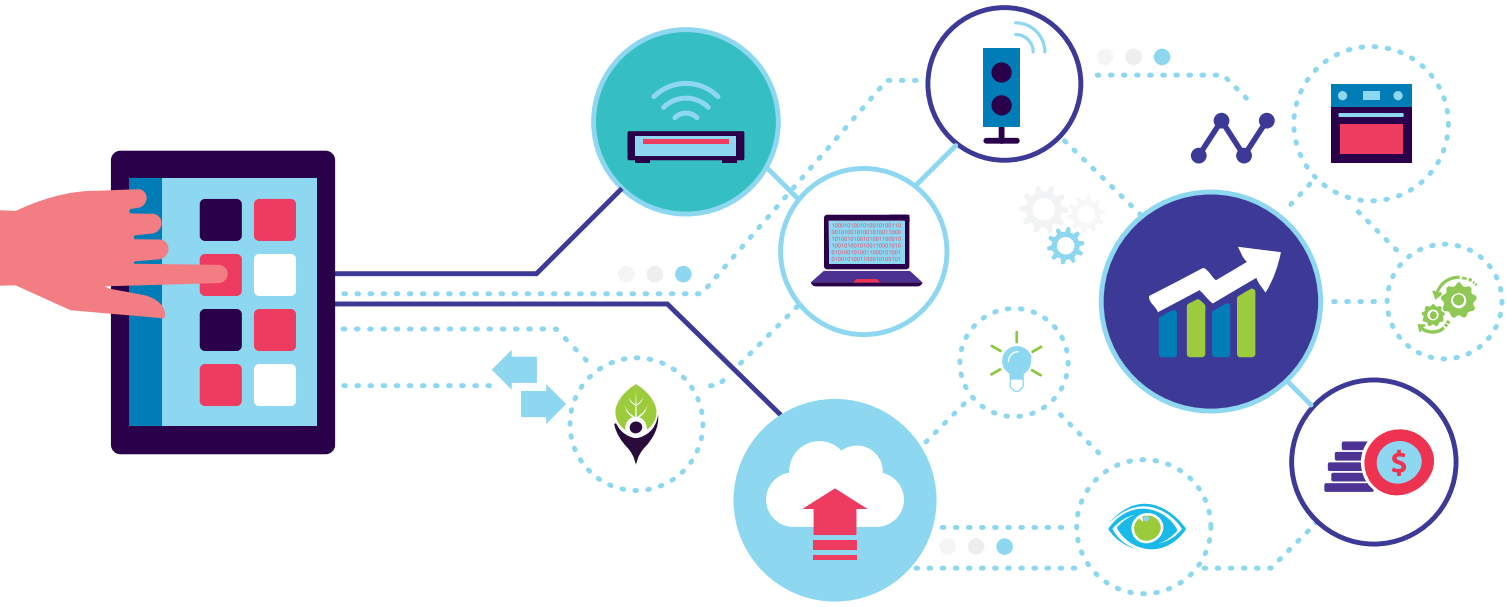
The success and effectiveness of the control tower "will depend in large part on the team that operates the tower and how they make use of the technologies, run the processes, and engage the people related to it."

Jörg Junghanns, Vice President Europe, Digital Supply Chain, Capgemini

Our approach: From evaluation to operations

Capgemini helps organizations develop a holistic intelligent supply network strategy, including the creation of a next-generation cognitive control-tower function. Our approach focuses on the following capabilities:

Strategize and design	Operate and optimize	Build and maintain
• Develop the cognitive control tower strategy; ensure alignment to the overall supply-chain strategy • Design the solution, including the standardization and harmonization of processes and technologies, and the integration of multiple control towers • Evaluate and select solution partners • Improve automation and use of analytics to generate actionable insights in the control tower	• Enable lean and flexible supply-chain teams to operate the control tower • Leverage process design expertise as well as platform and automation experience to provide in-depth solutioning and transformational services • Assist in the redesign of the operating model • Provide best-in-class control-tower services that enable productivity benefits driven by transformation, centralization, optimization, and automation	• Deliver technology services to suit local requirements for infrastructure, applications, engineering, testing, and operations • Provide a next-generation approach to control-tower system development, integration, operations, and maintenance • Integrate, manage, and develop the IT infrastructure systems



Working with Capgemini: The benefits of cognitive control towers

We work with clients on a strategic level, helping them increase the maturity of the foundational elements of a control tower and build cross-functional advantages in time, cost, and quality. Below are metrics that Capgemini has helped clients achieve through a cognitive control tower capability.

Revenue increase

- 0.4–1% sales increase due to higher customer satisfaction (e.g. higher OTIF)
- 2–5% increase in customer satisfaction and higher shelf and stock availability

Cost improvement

- 25–35% reduction in resource costs due to process transformation and workforce centralization and augmentation
- 10–15% reduction in supply-chain operating costs driven by touchless processing
- 3–6% decrease in transportation costs by improved sourcing and freight audit
- 2–4% reduction in transportation costs due to transport-mode optimization

Productivity

- 10% upfront productivity improvement
- 35% productivity improvement over five years
- 15% additional automation-driven productivity gains

Risk reduction

- Enabled end-to-end visibility across the network, which improved real-time re-routing and contingency capabilities
- Developed a scalable operating model and workforce to better react to expected and unexpected disruptive events
- Reduced compliance penalties (e.g. demurrage) due to proactive signaling and issues management

Sustainability

- Increased capacity utilization resulting in lower emissions
- Managed and monitored greenhouse-gas emissions across the network

Building cognitive control towers

 **1. Set the strategy**	• Create an enterprise-level strategy for the cognitive control tower, including how the function contributes to the overall supply-chain strategy • Define the scope of the cognitive control tower, according to geography (regional or global), function (logistics, planning, procurement, etc.) or industry
 **2. Establish the cognitive control tower system**	• Evaluate technology/software systems and identify optimal partners • Standardize processes, tools, and systems to enable data integration and the generation of accurate insights • Identify functions, processes, or departments to be monitored • Start with a pilot and scale over time
 **3. Ramp up operation teams**	• Identify the key required expertise to build up an efficient team • Design a governance model that balances the control tower centralization with the needs of the wider organization
 **4. Improve data and analytics capabilities**	• Identify key data domains and central data repositories • Integrate accurate, timely, and high-quality data within a central data warehouse • Create an enterprise team to oversee the ongoing collection, analysis, and maintenance of data • Continuously assess the business case of intelligent automation to create increasingly touchless processes
 **5. Connect one or more control towers**	• Repeat this process for additional control towers organized around different attributes • Integrate the control towers and their teams • Ensure there is a virtual handshake between each tower

Case study: Advanced order-management control tower for a global CP brand

Capgemini worked with a leading global consumer-products company to create a next-generation cognitive control tower strategy and solution that would prioritize stock across channels, as well as expedite orders from select customers. This capability stood in stark contrast to the company's existing system, which relied on manual intervention and warehouse-based processing to manage entries across a decentralized network.

We worked with the client to standardize and harmonize processes and technologies throughout the organization to generate data-driven insights about the health and performance of the supplier network. We then leveraged analytics, AI, and ML to create an order-management control tower that could anticipate shortages in supplies, components, or raw materials, which in turn reduced uncertainty within the supply network. In creating this enhanced visibility, the business was then able to design a more precise allocation portfolio based on real-time availability, possible disruptions, or other projected risks.

This dynamic control-tower capability was able to sense rapidly evolving changes in supply and demand and contextualize them based on business priorities, such as optimizing key accounts or maximizing margins. In the event of shortages or conflicts, the solution was also capable of suggesting alternatives or corrective actions.

Finally, the cognitive control tower created a more intuitive user experience, expanding access to data throughout the organization, enabling order downloads directly from the customer portal, and allowing the business to create an automatic replenishment capability based on orders, which enabled proactive order generation. As part of the engagement, we trained employees on the operation of this new capability and also worked with the organization to create a culture that encouraged effective collaboration and communication between teams.

The order-management control tower was highly effective in helping the business generate the following outcomes:

- 10% increase in order fill rate
- 7% increase in service level
- Material availability increase from 50% to 90% for modern trade
- Elimination of incorrect order generation
- Overnight order processing and increased warehouse efficiency
- Improved information for order vs. allocation and reasons for non-allocation
- Increased speed to market in servicing customers.

Capgemini's expertise in cognitive control towers

Our team has experience in designing, building, and running a variety of relevant capabilities for leading consumer-products companies around the world. Our control-tower engagements include:

- Fulfillment/order management and logistics
- Planning
- Customs operations
- SCM data
- Integrated finance supply chain.

For consumer-products organizations operating in this challenging environment, speed, flexibility, and agility are the new currencies by which the business will be measured. Often overlooked, the cognitive control tower plays a critical role in both optimizing real-time performance and building long-term resiliency.

Through this whitepaper series, we aim to help organizations rethink both the traditional supply chain and its underlying components. We encourage readers to review the other papers in this series – *The death of the supply chain* and *Continuous, touchless planning* – as well as our forthcoming point of view on manufacturing 4.0 to learn more about how to better manage the challenges and identify latent opportunities of this new environment.

About Capgemini

Capgemini is a global leader in consulting, digital transformation, technology and engineering services. The Group is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year+ heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. Today, it is a multicultural company of 270,000 team members in almost 50 countries. With Altran, the Group reported 2019 combined revenues of €17billion.

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Authors:

Wouter van Wijngaarden
Senior Manager
Netherlands
wouter.van.wijngaarden@capgemini.com

Jörg Junghanns
Vice President
Germany
jorg.junghanns@capgemini.com

Navin Lutchmun
Senior Manager
UK
navin.lutchmun@capgemini.com

Joe Vernon
Senior Manager
North America
joe.vernon@capgemini.com

Sébastien Neyme
Principal
France
sebastien.neyme@capgemini.com

Hugo Texier
Vice President
Singapore
hugo.texier@capgemini.com

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