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# OPTIMIZING SUPPLY CHAINS FROM THE OUTSIDE-IN

Improve Resiliency and Agility with a Command Center →



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## Maximizing Opportunity During Supply Chain Disruptions

Supply chains have been buffeted by recent macroeconomic developments. Just-in-time manufacturing processes met their match when confronted with raw material and workforce shortages, customer demand volatility, snarled logistics, and soaring prices due to pandemic-related, geopolitical, and other issues.



As a supply chain leader, you know that disruption is here to stay. Issues that impact your business include the fast pace of technology-driven change, the interconnectedness of global commerce, new regulatory developments, geopolitical tensions, and climate change impacts, among others.

If you work in manufacturing, these issues are harming your ability to source materials, produce goods cost-effectively, and take them to market on a timely basis. If you work in retail, these same challenges are impacting your ability to predict consumer demand, keep products in stock, and manage end-to-end costs.

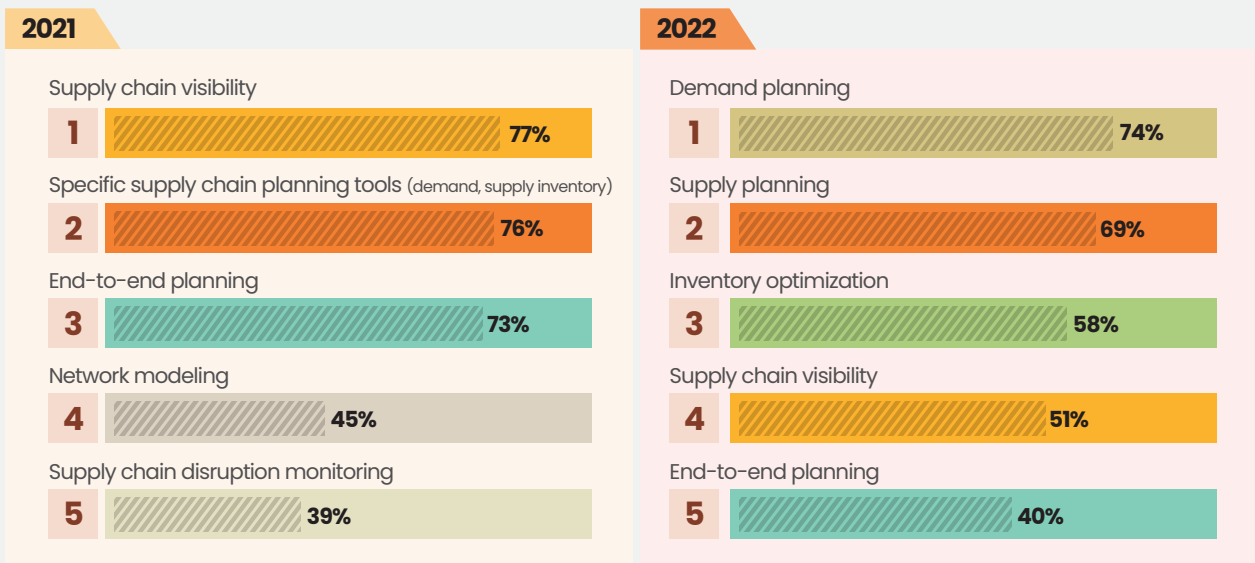
So, how can you and your team predict these unexpected macro developments and respond proactively to mitigate risks and maximize financial upside?

### From Increasing Visibility to Planning and Optimizing Processes

For supply chain leaders, improving visibility into processes is no longer enough. They want to equip teams with the data and tools to sense and respond to fast-moving developments.<sup>2</sup>

### DIGITIZATION PRIORITIES ARE SHIFTING FROM VISIBILITY TO DEMAND AND SUPPLY PLANNING.

Global supply chain leaders' agendas for digitization, 1% of respondents (n = 113)



1. "What is supply chain?," McKinsey, article, August 17, 2022, <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-supply-chain>  
 2. Knut Alicke, Edward Barriball, Tracy Foster, Julien Mauhourat, and Vera Trautwein, "Taking the pulse of shifting supply chains," article, McKinsey, August 26, 2022, <https://www.mckinsey.com/capabilities/operations/our-insights/taking-the-pulse-of-shifting-supply-chains>

## Controlling End-to-End Supply Chain Processes

Deploying a supply chain command center enables you to create the predictive insights you need to anticipate changes and align investments and capabilities appropriately.

## Gartner

Gartner, which coined the term in 2022, defines a supply chain command center as **“a tool consisting of existing and new technologies combined with near-real-time data from the business ecosystem.”**

Expanding on Gartner’s description, we define a supply chain as a centralized hub that combines connected equipment, advanced analytics, decision intelligence, automation, and business processes, while also integrating partners. It provides enterprise teams with all the capabilities to monitor, analyze, and optimize an enterprise’s end-to-end supply chain operations. It differs from dashboards, which provide insights into specific domains, and control towers, which offer visibility into – and control over – specific functions. Both dashboards and control towers provide limited gains, but also entrench data and business silos.

Supply chain command centers also provide cognitive capabilities. That means they never stop learning, continually improving decision making and optimizing processes.

### Optimize Your Business with Command and Control Capabilities

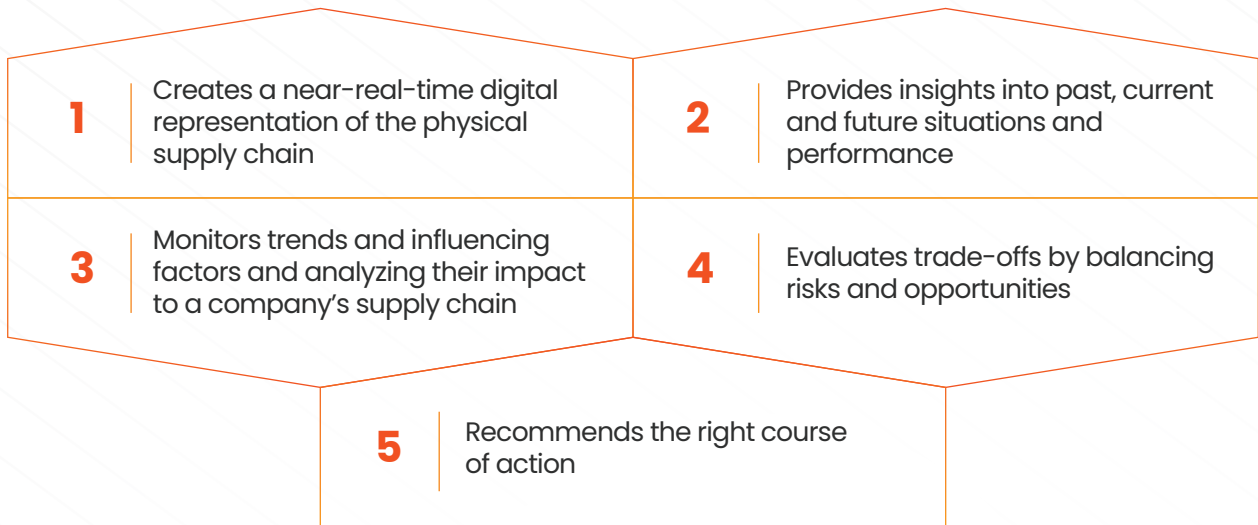
Move from reactive insights and limited automation, to optimizing your entire supply chain in near-real-time.



Industry benefitting from integrated command center: Consumer packaged goods, retail, manufacturing, and more.

3. Christian Titze, Alexander Hoeppe, Innovation Insight: Supply Chain Command Centers, report, Gartner, June 3, 2022. Not available on Gartner website. Only available as vendor asset.

## According to Gartner, a supply chain control center:<sup>4</sup>



## Integrating Internal and External Data from a Wide Array of Sources

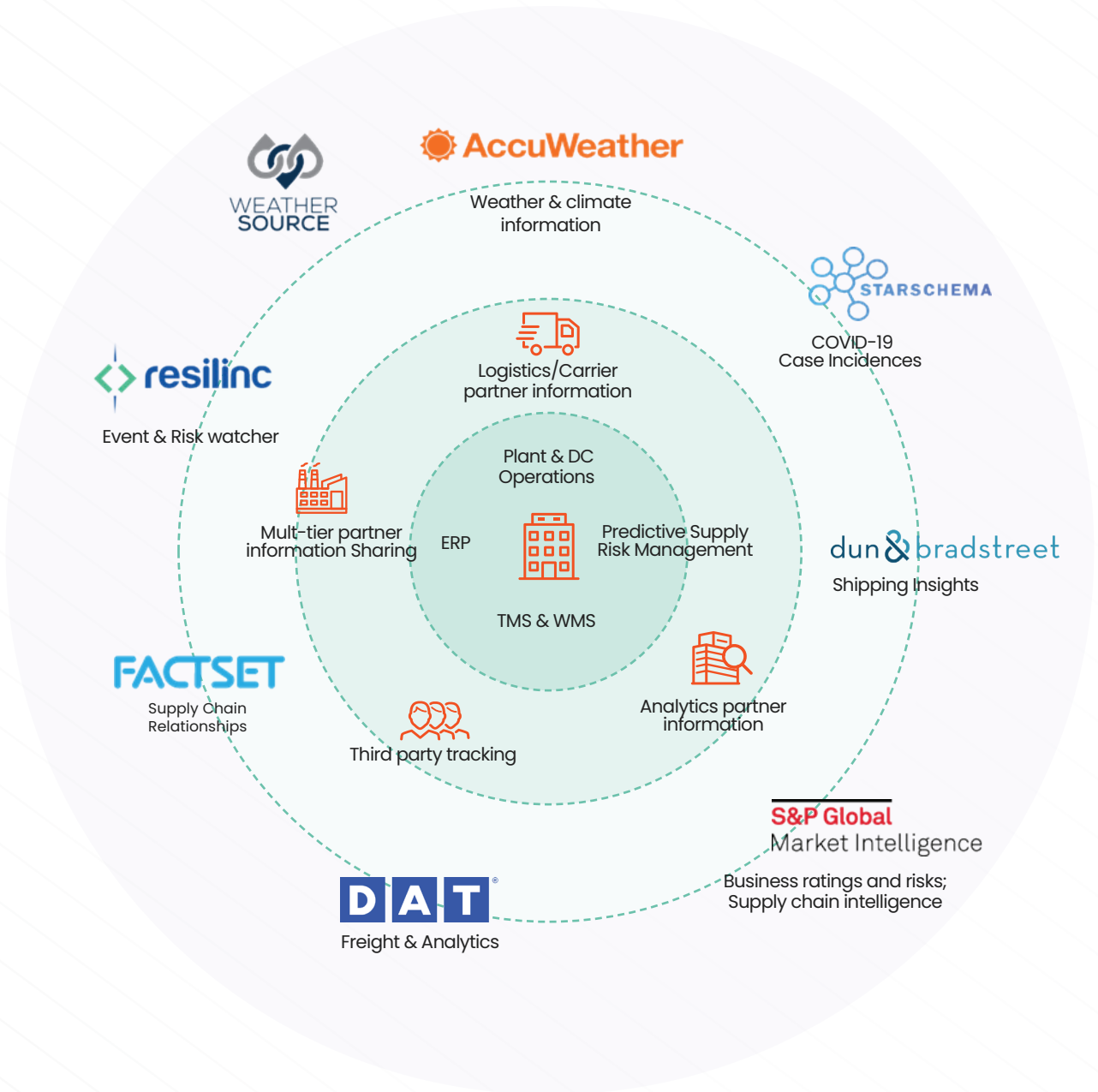
Supply chain command centers integrate real-time internal and external data across key domains and provide focused insights. They also offer predictions and prescriptive recommendations that will enable you to reduce risks and improve performance, as well as automate key processes to enable a faster response to routine changes. As you use these capabilities, you can optimize all supply chain processes on a day-to-day, hour-by-hour basis, identifying and mitigating risks across key domains and your entire business. By moving faster to address issues, you can select the best options to protect your business and optimize revenues and margins. You can also identify and seize emerging opportunities for higher ROI.

4. Innovation Insight, ibid.



## A SUPPLY CHAIN COMMAND CENTER INTEGRATES MYRIAD DATA SOURCES

With integrated internal and external data, teams can use supply chain command centers to predict how market events will impact their business.



## 5 Ways Supply Chain Command Centers Improve Operational Resiliency

Here are five ways you can use supply chain command center capabilities to enhance situational awareness and improve decision making.

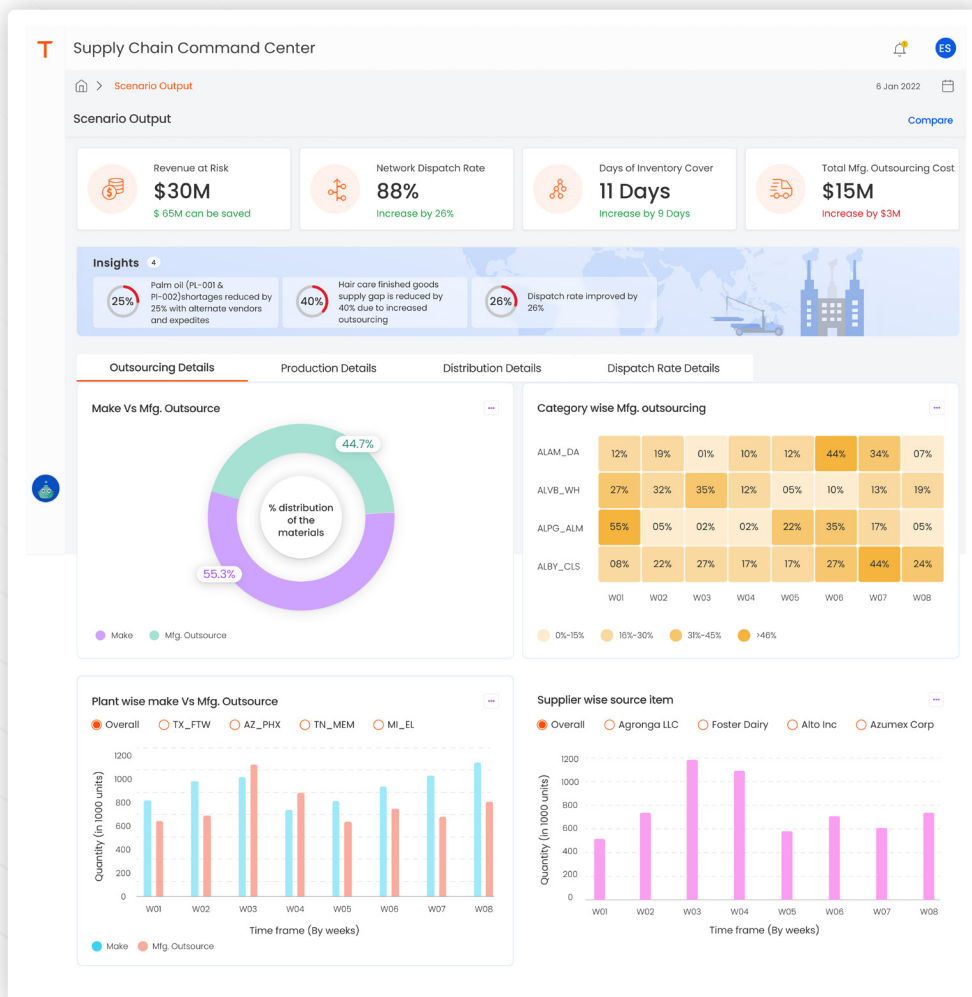
# 1 Increase visibility into end-to-end performance

You want to see and model supply chain processes across the entire value chain. That means being able to review changes and challenges with customer demand, raw material availability, production capabilities, order fulfillment, warehousing capacity, distribution, transportation processes, and product stocking and reordering.

You would also like to understand how supply chain issues impact key performance indicators (KPIs) for supply chain health, such as cash-to-cash cycles, the cost to develop products, inventory management, stock keeping unit (SKU) costs, and operating profit margins.

A command center provides all of these capabilities: acting as the nerve center of supply chain operations. External data is ingested, integrated with internal data, aligned with KPIs, and organized around specific domains. It's then presented in a highly visual, interactive interface, making it easy for you and your team to gain connected insights on risks and performance in near-real-time, as well as drill down on specific indicators. You can view insights through different personas and roles, making it easier to understand how choosing a course of action will impact them both positively and negatively. And with faster action, you can improve planning and prioritize actions, positively impacting revenue.

As an example, healthcare and skin care companies rely on palm oil to make many of their products, which retailer then stock. So, being able to view key factors, such as raw material and SKU availability, production costs across different scenarios, logistics issues, and financial impacts, would be very valuable to supply chain planners in both these industries.



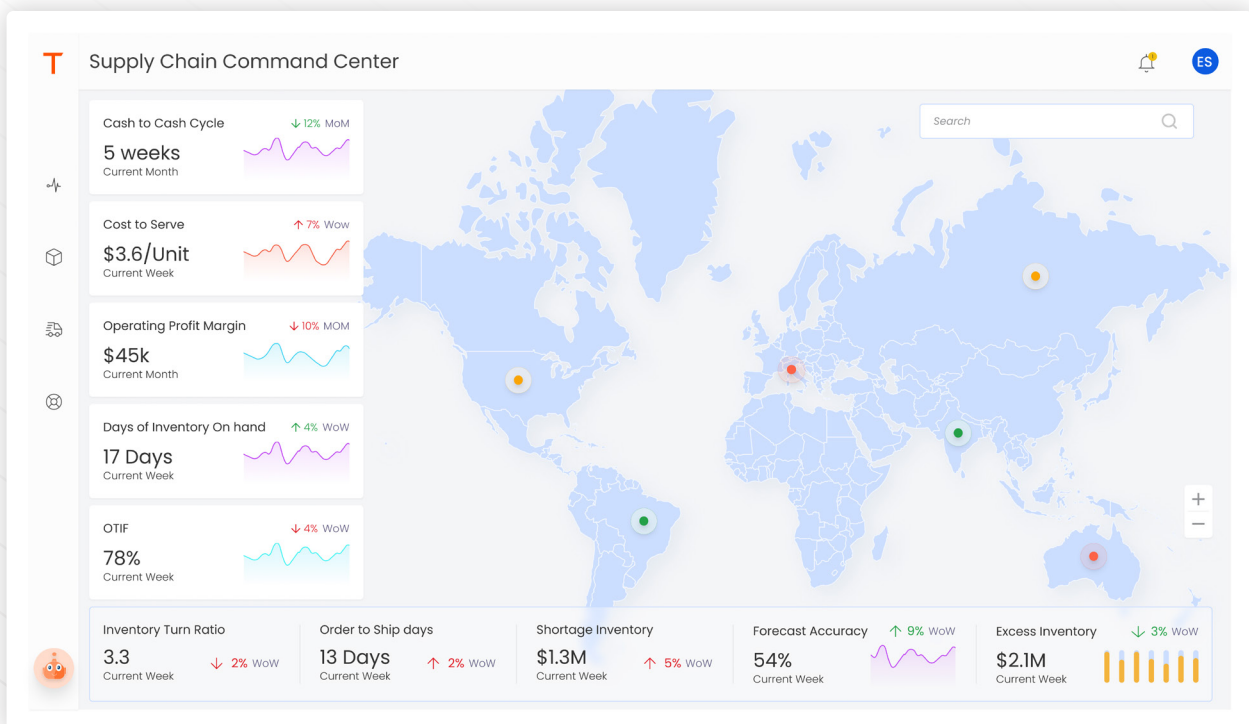
## 2 Proactively anticipate supply chain disruptions

Disruptions are occurring faster than ever. Yet, many companies still struggle to integrate and contextualize external data, that could help them detect early warnings of potential disruptions and move swiftly to address them.



Command centers provide alerts on external factors that can harm supply chain processes, such as weather, geopolitical issues, regulatory bans, supplier quality issues, and logistics challenges at ports. You can use this data to develop mitigation strategies and assess their relative benefits and costs.

Let's say supply chain planners at the skin care company are concerned about possible palm oil shortages. They'd like to look beyond internal issues, such as raw material availability, and model macroeconomic impacts. These factors could include geopolitical conflicts that lessen palm oil production, shortages in related products (such as sunflower oil) that increase demand for palm oil, or floods and droughts that could negatively impact harvests. The supply chain command center team integrates all of these external data sources and provides connected insights, such as early warning signs, teams can leverage to improve decision making.



5. Martin Placek, "Number of supply chain disruptions worldwide from 2019 to 2021," chart, Statista, April 12, 2022, <https://www.statista.com/statistics/1267082/supply-chain-disruptions-worldwide/>



### 3 Model multiple scenarios to understand impacts

Not all supply chain impacts are equal. So, it's beneficial to be able to rapidly model and assess impacts on KPIs, such as on-time, in-full (OTIF) and fill rates, revenue at risk, network dispatch rates, inventory on hand, and the cost of outsourcing production to suppliers.

With a supply chain command center, you can run different scenarios to test the performance of different strategies and how they accomplish goals and address competing objectives. For example, if you are experiencing issues with OTIF rates, you may be able to solve this issue multiple ways: from optimizing transportation, running multiple shifts, or even expediting inbound purchase orders.

At the skincare company, planners model the impacts of maintaining the status quo, which could result in lost revenues versus increasing outsourcing to one or more suppliers or shifting production to a company-owned plant in a nearby geography. They can assess the different impacts on KPIs, quickly driving to insight on the variables that are most important to the company.

The screenshot displays the 'Supply Chain Command Center' interface. At the top, there's a header with the company logo and user initials 'ES'. Below that, a navigation bar shows 'Scenario Inputs'. The main content area is titled 'Create New Scenario Plan' and includes a date selector for 'Oct 1st 2022' and a dropdown menu for '8 Weeks'. The interface is divided into several tabs: 'Sourcing Input', 'Plant Input', 'Production Input', 'Distribution Input', 'Cost Input', and 'Optimized Input'. The 'Optimized Input' tab is currently selected and contains several input fields: 'Target Service Level' (with a 'Fill in your input' placeholder), 'Backlog Orders' (with a 'Fill in your input' placeholder), 'Transportation Cost' (with a 'Fill in your input' placeholder), 'Set Production Budget' (with a 'Fill in your input' placeholder), and 'Mfg. Outsourcing %' (with a 'Fill in your input' placeholder). There is also an 'Allow Pre-Build' checkbox and a 'Save input and Proceed' button.

### 4 Use an optimization engine to choose the best option

It's not always clear which scenario to choose, as you're likely trying to optimize multiple factors, including competing objectives. Fortunately, supply chain command centers provide prescriptive optimization engines, powered by artificial intelligence (AI) and machine learning (ML), that prescribe actions, removing the guesswork from decision making.

You can use trade-off analyses to choose the best course of action that provides the optimal outcomes. You can also automate routine decisions, increasing operational efficiency and focusing your team on high-value exceptions that warrant deeper analysis.

Compare Scenario ⓘ

Scenario	Revenue at Risk	Network Service Level	Days of Inventory Cover	Total Mfg. outsourcing Cost	Total Production Cost	Total Cost of Procurement	Total Distribution Cost	External Sourcing %	Pre-build Target
Base Scenario	\$120M	72%	2 Days	\$12M	\$40M	\$23M	\$25M	36.2%	1 Day
Simulation -1	\$30M	88%	11 Days	\$15M	\$39M	\$24M	\$30M	44.7%	10 Days

PUBLISH PLANNING

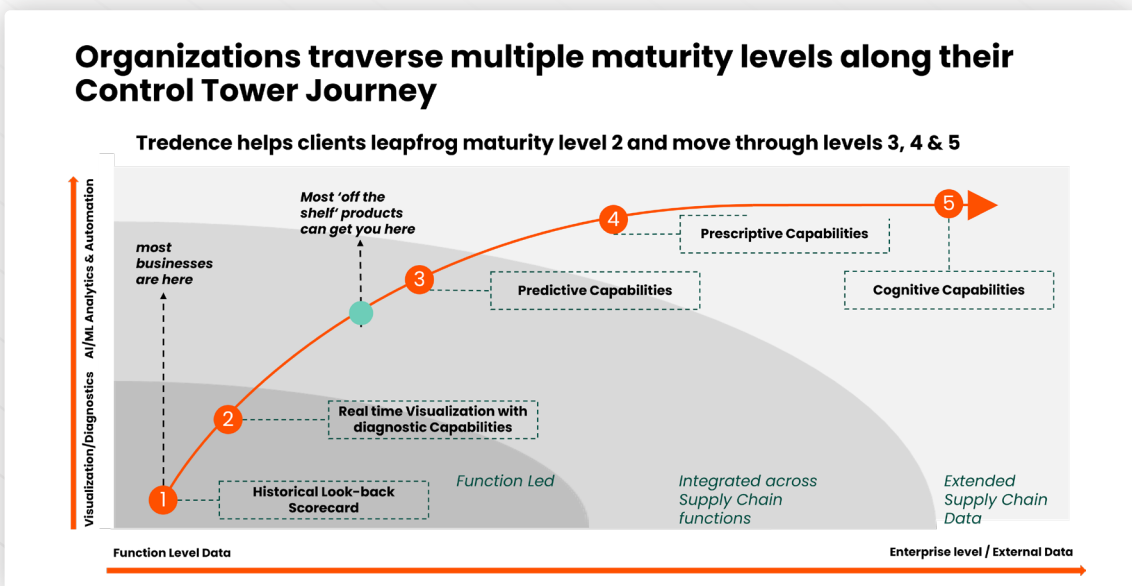
After running multiple scenarios, the skincare company’s supply chain planners decide to temporarily outsource palm oil production to two different suppliers and re-evaluate this decision month by month. This mitigation strategy will increase inventory on hand at a higher cost. As a result, planners may need to develop a new mitigation strategy if the original supplier’s product shortages prove to be long-term.

## 5 Optimize end-to-end processes with automation and self-healing

Command centers enable you to manage your supply chain outside-in, continually assessing the impact of market factors on your business. By anticipating disruptions, viewing them through a personal and functional lens, and working proactively to mitigate them, you can increase enterprise agility and resiliency.

Your team will likely make more decisions manually at first. However, over time, you’ll leverage automation to execute routine decisions, self-healing common problems. Doing so will increase your responsiveness to key business dynamics.

The supply chain command center sits on top of your other systems of record, like customer relationship management (CRM), enterprise resource planning (ERP), and supply chain management (SCM). It publishes data and decisions to these systems, rather than replacing them. By increasing the maturity level of your supply chain processes, you will outpace competitors who rely on reactive processes, such as scorecarding, or domain-specific tools, such as dashboards and control towers. Your capabilities, responsiveness, and profitability will only grow over time.



## CASE STUDY

# Enhancing Real-Time Visibility and Performance Metrics for a Fortune 500 Global Leader With Supply Chain Command Center

Tredence Supply Chain Command Center is designed to integrate key areas of the supply chain, providing real-time connected insights, predicting disruptions, and offering intelligent decision support to mitigate issues.

A Fortune 500 Global Leader recently faced the challenge of ensuring near real-time visibility and predictive insights into upcoming disruptions for their SCM performance indicators within a complex, vast, and disparate supply chain system. They wanted to track and predict Key Performance Indicators (KPIs) and augment decision-making with advanced AI recommendations and robust analytics.

## The Challenge

The client wanted to overcome the supply chain blind spots and silos. They had difficulty predicting and mitigating risks associated with incoming supplies, which frequently led to inventory shortages, revenue loss, and disruptions in service delivery. In addition, the inability to forecast warehouse utilization trends frequently led to overcrowded spaces for storage, incurring obsolete detention charges. Their existing approach was beset by several other roadblocks, including:



### Limited Real-Time Visibility and Insights

The client's SCM team maintained an extensive repository of functional scorecards. However, these were manually compiled in Excel, resulting in a substantial information gap



### Data and Application Silos

The client's data was scattered across over 60 disparate data sources, creating a fragmented view of their supply chain performance



### Impeded Network Insights

Collaboration was hampered by sequential information flow, causing delays across core operating functions



### Lack of Predictive and Prescriptive Intelligence

The client struggled with planning cycles within isolated functions, leading to unsynchronized responses

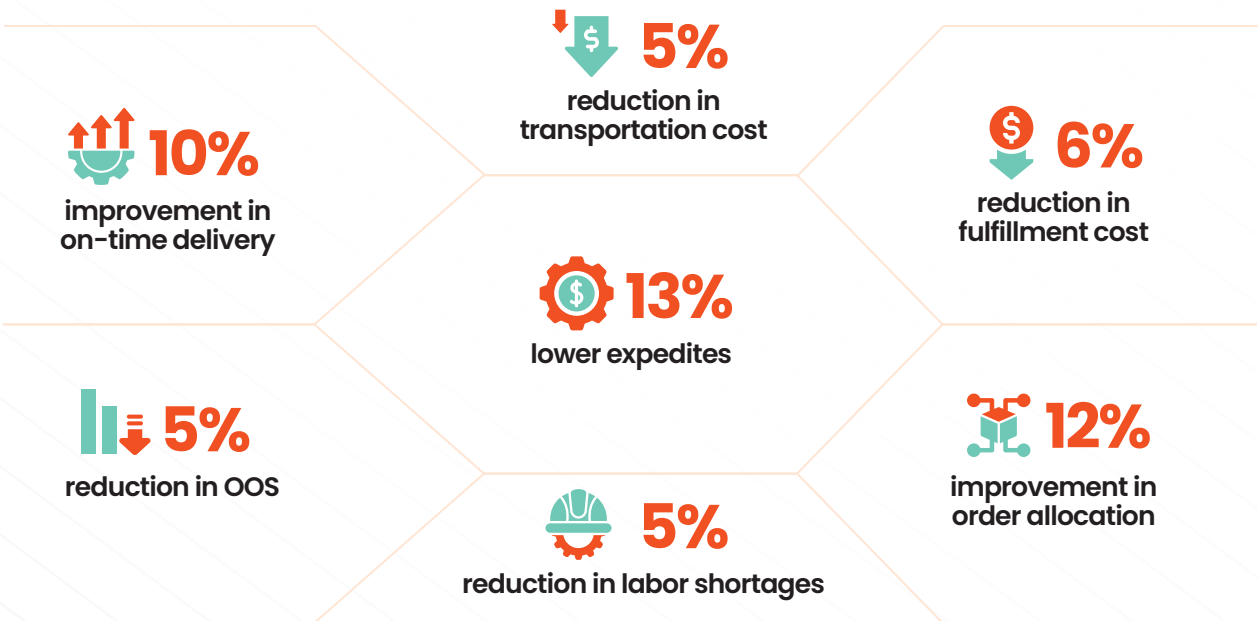
## The Solution

Tredence implemented a suite of data science solutions to address these challenges, integrating them into the Supply Chain Command Center. These included:

- ▶ **Persona-Based Visualizations:** Improving overall processes and KPIs
- ▶ **Real-Time Alerts:** Implementing alerts for issue identification and cross-functional action recommendations
- ▶ **Comprehensive KPI Library:** Creating a holistic KPI library covering all supply chain functions
- ▶ **Self-Service Diagnostics:** Enabling causality analytics within supply chain nodes
- ▶ **Advanced Prescriptive and Scenario Planning Models:** Leveraging AI, ML, and OR to develop predictive and prescriptive models
- ▶ **Drill-Down Opportunities:** Providing the ability to dig deeper into data for identifying future growth and improvement opportunities
- ▶ **Predictive Models:** Predicting delays to inbound shipments, predicting Service levels, etc.

## Business Impact

The SC Command Center's integration led to substantial performance improvements, including:



## Bottomline

Tredence Supply Chain Command Center drives better responsiveness to planned and unplanned events across the value stream, optimizing the end-to-end value chain while maximizing service levels and margins. Its application underlines the transformative potential of data-driven solutions in a digitally integrated supply chain environment.

## CASE STUDY

# Supply Chain Command Center: Building Supply Chain Resiliency with Connected Insights and Collaborative Actions for a Fortune 100 CPG Company

One of the world's leading CPG firms, specializing in foods and beverages, faced supply disruptions for various reasons, leading to production interruptions and stock-outs.

## The Challenge

The client experienced supply disruptions, resulting in stock-outs. The sourcing team wanted to identify materials at risk of stock-out due to macro and operational supply disruptions to mitigate issues before they worsened.

## Solution: Supply Risk Monitor System

In response, Tredence deployed an easy-to-consume Supply Risk Monitor system with several capabilities, including:



**Predicting Lead Time:** The Monitor takes into account operational aspects, such as quality, order attributes, and vendor attributes, as well as external disruptors, like extreme weather, port congestion, traffic, and other supply chain disruptions.

The solution considers operational factors, such as quality, order attributes, and vendor attributes, in addition to external factors, such as severe weather, port congestion, traffic, and other supply chain disruptions.



**Calculating Stock-out Possibility Score (SPS):** This score assesses the risk of stock-out based on two inputs - item metrics and dynamic market risk.



**Providing a View of External Disruptions:** The Monitor also offers visibility into disruptions that could potentially impact the supply chain.

These capabilities align with the Supply Chain Command Center's key features, which enable near real-time visibility to orders, shipments, and key customer-centric KPIs. It also allows for proactive sensing of supply chain network disruptions, offers connected insights in case of disruptions, and leverages advanced analytics for decision support, considering impacts across the value chain.

## Business Impact

The integration of Tredence's Supply Chain Command Center and the Supply Risk Monitor system led to significant performance improvements:



The Supply Chain Command Center thus enhances responsiveness to planned and unplanned events across the value stream, with the end goal of optimizing the end-to-end value chain while maximizing service levels and margins.



## Work with Tredence to Deploy a Supply Chain Command Center

Tredence can help you build and deploy a command center to optimize supply chain processes. We design solutions in a modular fashion and use accelerators to speed to value. Our solutions are 60 to 70 percent prebuilt and then customized to your unique requirements. You gain a proof of concept (PoC) or minimum viable product (MVP) in just a few weeks that will demonstrate the value of deploying a supply chain command center with Tredence. We can then scale fast, either extending the solution across more use cases, geographies, or across your entire enterprise.



**6-8 weeks**

**Time to a supply chain command center POC or MVP with Tredence.**

### Steps to a Successful Command Center Implementation

Your accelerated journey with Tredence includes the following steps:

**1**

#### Design and discovery

We will map your processes, discover and map your data, standardize documentation, and create a customer-centric user flow and wireframes.

**2**

#### Customization and deployment

We will then implement prebuilt AI/ML optimization algorithms, including industry-standard data models and external API connections. We will also provide a prebuilt KPI library and aggregation layer.

**3**

#### Testing and rollout

We will perform unit, user acceptance, and integration testing, before turning over the new tool. We'll then perform a dry run, system testing, and training to ensure a seamless rollout.



Business results you can expect to achieve with a full rollout of a supply chain command center include:

**700+**

Gaining comprehensive diagnostic and predictive KPIs

**\$100M**

Recovering significant lost sales, depending on business size

**5%–8%**

Reducing cost to serve

**100%**

Achieving total automation between data sources and real-time insights

**10%–15%**

Improving forecast accuracy

**3%–5%**

Improving overall service levels

### Ready to learn more?

As a manufacturing business, you can't avoid all supply chain disruptions. However, you can create the capabilities to manage them effectively and enhance outcomes with every decision.

Schedule a 60-minute complimentary discovery call with a Tredence expert to explore how you can improve supply chain ROI with command and control capabilities that enable precision decision making.





## About the Author

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### Hemanth Holla

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Tredence Inc.

Hemanth heads the product innovation for the supply chain practice at Tredence. He has extensive experience in supply chain consulting, product innovation, and digital transformation. He has worked on multiple digital transformation & advisory projects to help clients improve supply chain processes & efficiencies. He has implemented both bespoke analytics solutions & best of breed solutions across industries.

Hemanth is passionate about solving supply chain problems using a combination of process improvements and technology.

## About Tredence Inc.

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Tredence is a global data science solutions provider focused on solving the last mile problem in AI. The 'last mile' is the gap between insight creation and value realization. Tredence is a Great Place to Work-Certified and as a 'Leader' in the Forrester Wave: Customer Analytics Services. Tredence is 2000+ employees strong with offices in San Jose, FosterCity, Chicago, London, Toronto, and Bangalore, with the largest companies in retail, CPG, hi-tech, telecom, healthcare, travel, and industrials as clients.

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