# Bringing Resiliency with Trinamix Supply Chain Control Tower

## TRINAMIX WHITE PAPER

By Molly Chakraborty & Viral Mehta

# Supply Chain Resiliency - Unanswered Questions

In recent years supply chain organizations have faced threats from climate change, global trade relations, and pandemic to name a few. Sustainability in the face of disruption and growth has been a major challenge for businesses. These disruptions have been plaguing the industry more often than not in the last decade or so. Being nimble and having levers to proactively react to these challenges is a key to survival and growth. A Supply Chain Resiliency Control Tower that brings events and disruptions to the rescue of supply chain leaders poses a rescue path.

In the past, businesses had Command Center that would connect data on a single platform from multiple systems to serve as a decision support system, a “war room” where analysts from various organizations would interpret data in order to make business decisions. In today’s world Supply Chain Control Tower has evolved to play a much larger, bigger, and more strategic role. Powered by AI/ML, it not only connects business data with events in the supply chain providing real-time data, but it also applies predictive analytics and has become a prescriptive tool. It can present alternates to the business users aiding them in making optimal decisions. Thereafter, it can automate decision-making and execution. Thereby it can play the complete CORE role-model (recommended by Gartner) and become a self-sustaining autonomous engine. In the age of disruption, it helps in bringing resiliency and growth to an organization. What was Command Center in the past is Supply Chain Resiliency Control Tower today.

Trinamix Supply Chain Resiliency Control Tower (TSCRCT) has a single data model and holds data in a single platform. This data is refreshed in real-time.

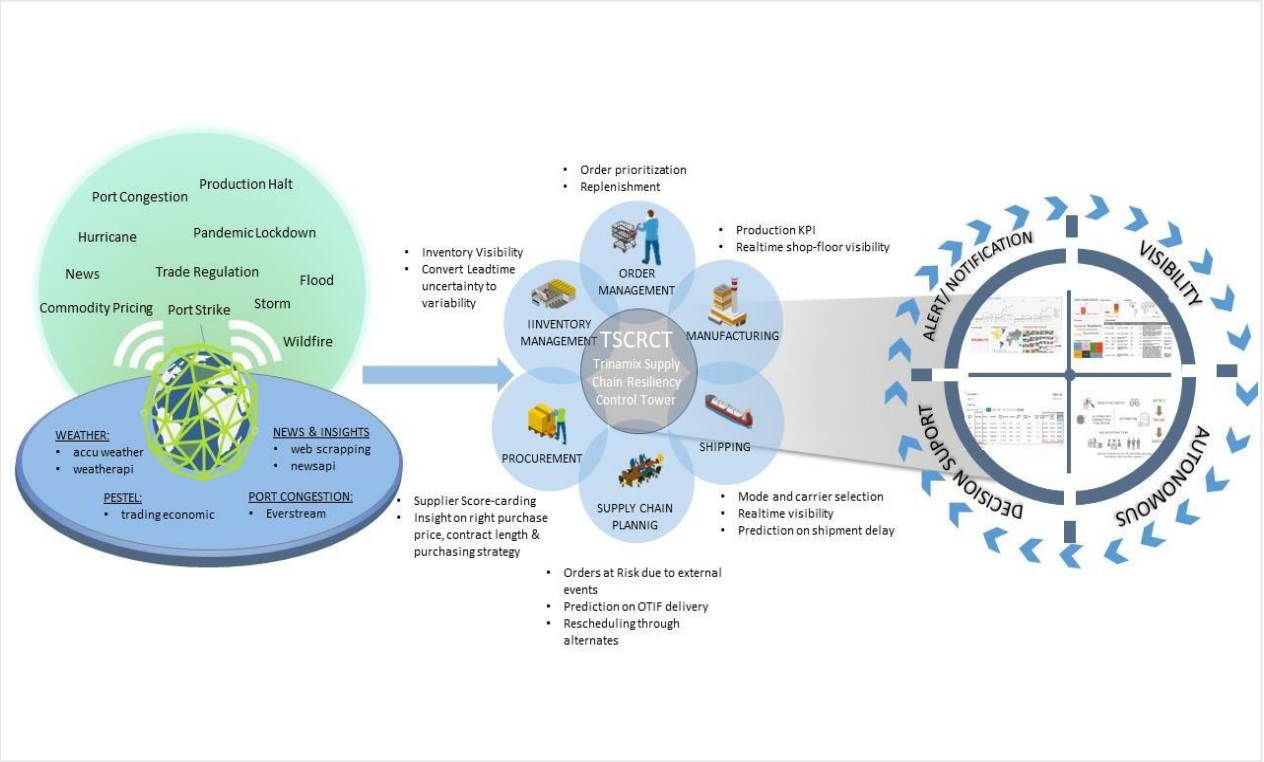
## What Questions are Answered

Supply Chain Control Tower can help businesses answer questions like:

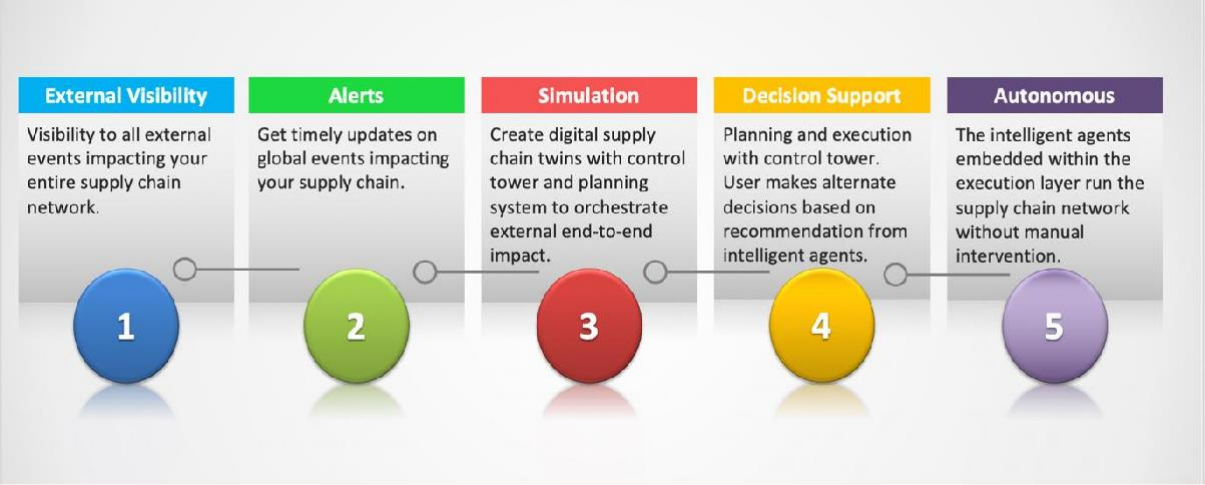
- What is the severity of risk?
- Which customer orders are impacted?
- What can I do to mitigate the risk?
- What are my alternatives?
- What is the financial impact of the risk?
- What is the financial impact of the alternatives?
- Which supplies are impacted by the event?
- What is the lateness caused by the event?

It also continually listens to the events, news, and PESTEL data from the internet. It reads structured and unstructured data. It contextualizes this information with the business data. It applies AI/ML and plays the role of a human mind to derive the potential risks these events pose to the business. Using powerful analytics, the Trinamix Supply Chain Resiliency Control Tower (TSCRCT) presents these risks in the form of a smart dashboard, double click, alerts, and warnings for business leaders and analysts to make quick decisions. It also has the ability to prioritize and rank the risks, suggest smart alternates, and help businesses make decisions. It can finally help execute these decisions and real-time refresh the dashboards with the latest state of the system.

## How does it work



## Features




### External Visibility (Visibility to all the external events impacting the entire network)

Create end-to-end visibility across your supply chain with a control tower that correlates data across siloed systems with external event information to provide actionable insights into potential disruptions — all in personalized dashboards — so you can manage the exceptions.

### Alerts (Get timely updates on global events affecting your supply chain)

Better predict disruptions and improve resiliency with smart alerts and real-time actionable insights to help you understand the upstream and downstream impact of events on customers and prioritize your response.

### Simulation (Create digital supply chain twin with control tower and planning systems to orchestrate end to end impact of external events)

Create scenarios based on disruption impacting the supply chain and orchestrate the impact of external events within planning systems, allowing you to sense and react to issues quickly while managing risks and disruptions in your supply chain proactively. Collaborate with your supply chain stakeholders and take immediate actions to resolve issues

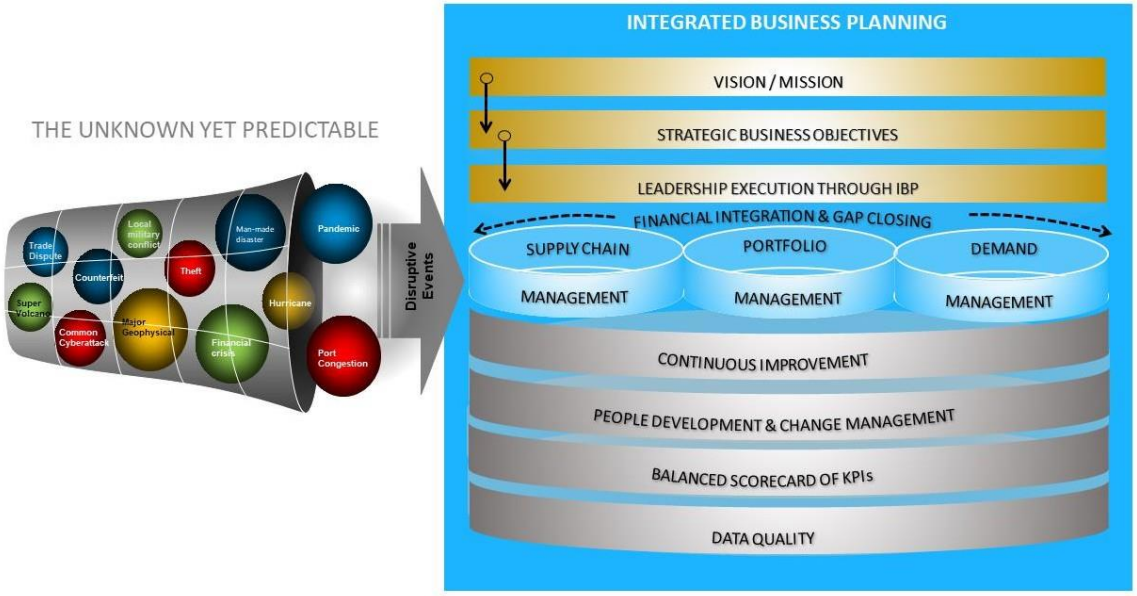
### Decision Support (Planning and execution with the control tower. Users make an alternate decision based on recommendations from intelligent agents)

Better collaborate on and manage the impact of external events across the entire supply chain with digital playbooks, combined with supply chain applications, that help you quickly respond to unplanned events and hone execution to drive KPI performance.

### Autonomous (The intelligent agents embedded within the execution layer run the supply network without manual intervention)

Create actionable workflows that can be customized to meet unique requirements and process steps required to automate actions within source transactional systems.

# INTEGRATED BUSINESS PLANNING




**"source based upon an original D M Integration Ltd model"**

Integrated Business Planning balances different elements of planning into a single cohesive process to produce the best results for an organization.

- Supply and Demand
- Finance & Operations
- New Product Introduction
- Collaboration
- Execution and Delivery

Supply Chain Resiliency is key for organizations to sustain disruptions, develop a robust organization and hence foster growth. In a global network of the supply chain, risks to the supply chain are manyfold. A system driven by a blind-sighted view of risks or delayed response to potential threats is only a recipe for failure or missed customer delivery. However, in today's supply chain data is still disjointed. Organizations are still behind in a single integrated real-time view of supply chain data of itself along with its partners and suppliers. This is bundled with a lack of visibility of the threats created by events happening in of weather, pandemic, fire hazard, or even man-made crisis.

- Events in-between S&OP cycle are left to business to manage manually
- Suppliers are slow to take action and inform delays
- When the new and its impact reaches supply chain organizations, it is already too late to react or respond
- This leaves businesses vulnerable and victims of the inadequate data to be proactive and resilient

## Who will benefit

| CSCO/CIO | Demand Planner | Supply Planner | Procurement Manager | Distribution Manager |
|---|---|---|---|---|
| **Increase Topline**<br>Reduce latency by pinpointing future trends to strengthen approach and build informed long-term strategies | **End to End Visibility**<br>Visualizes data from multiple sources to ensure holistic evaluation, insights & decision support processes | **Reduce Latency**<br>Self-serve data visualization tool to asses risk, stockouts and severity. | **Price Clarity**<br>Strengthen negotiating power with instant access to market pricing & data to inform competitive strategies | **Actionable Insight**<br>Actionable insights to evaluate potential stockouts and impacts due to external risk |
| **Cost Savings**<br>Save on premium cost across functions to build resiliency based on uncertainty vs predicted variability | **Improved Planner Efficiency**<br>Leverage automation and predictive decision-making to decrease manual interventions | **Simulations**<br>Create what-if scenarios to understand alternate actions that will help mitigate risk | **Manage Risk**<br>View price volatility & understand primary cost drivers to better manage risk; assess supply chain impact & identify alternatives | **Risk Monitoring**<br>Monitor health of supply chain network to evaluate potential disruptions. |
| **Service Level**<br>Optimize inventory positions and improve inventory visibility to enhance service level | **Reduce Forecast Error**<br>Correlation of event and attributes that drive sales | **Digital Twin**<br>Model digital twin to dynamically update planning attribute & variability factors to represent physical supply chain. | | **Improved Accuracy**<br>Leverage AI and ML capabilities for more accurate predictions on lead times. |

## How is TSCRCT Unique

- Brings external events to your supply chain and identifies impact of the risk.

  Other control towers only brings your organization data

- Runs in autonomous mode and alerts about your risk to you and the severity of risk.

  Contextualizes based on severity

- Makes you act proactively before the risk actually become a reality.

  Other control towers are reactive

- Dashboard is bi-directionally integrated to your supply chain system to allow simulation and action

  Other control towers are only single direction and receives data from your supply chain

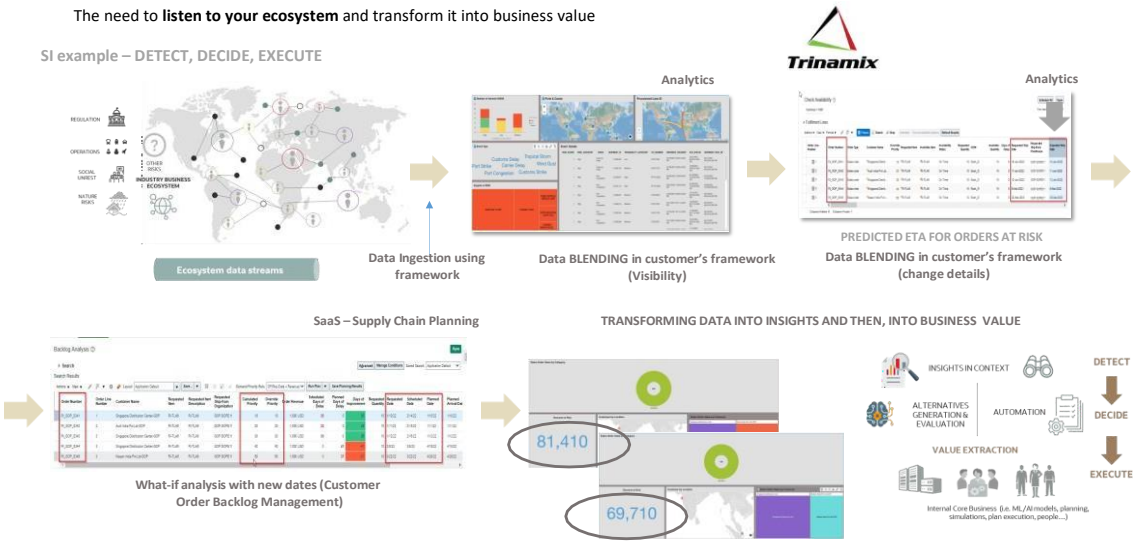
- Design with built-in use case to manage port congestion, IBP, Supplier Score Carding

  Other control towers need to be adopted for use cases to be designed

## Control Tower Financial Benefits

# Some Business Use Cases

## 1. How Port Congestion effect can be reduced by TSCRCT (Trinamix Supply Chain Resiliency Control Tower)




### The Event

There is port congestion through which my supplier shipments flow. With traffic increasing port congestion and hence its impact on the supply chain is a common phenomenon. When such events happen supply chain organizations must be informed promptly to access the impact and plan for alternates.

### The Risk

TSCRCT will detect the risk, analyze the level of impact. One example of the impact could be the customer orders that will be delayed. It will also pinpoint the customer orders that will be impacted and also the weeks of delay.

### The Alert

It will alert the business with the details of the impact. It will present in a dashboard the root cause and degree of the impact, and highlight the customer orders with monetary impact.

### The Alternates

TSCRCT will present the alternatives an organization have to reduce the impact. The alternatives can be of-loading to the alternate supplier or re-prioritize customer orders or moving inventory between branches.

### Scenario Planning

Using Oracle Supply Panning, Backlog Management, and Oracle GOP Cloud, supply chain planning organizations can perform several scenario planning and decide on the alternates to mitigate the risk and eliminate the major impact. This process may also involve collaboration with suppliers and customers to come to a conclusion.

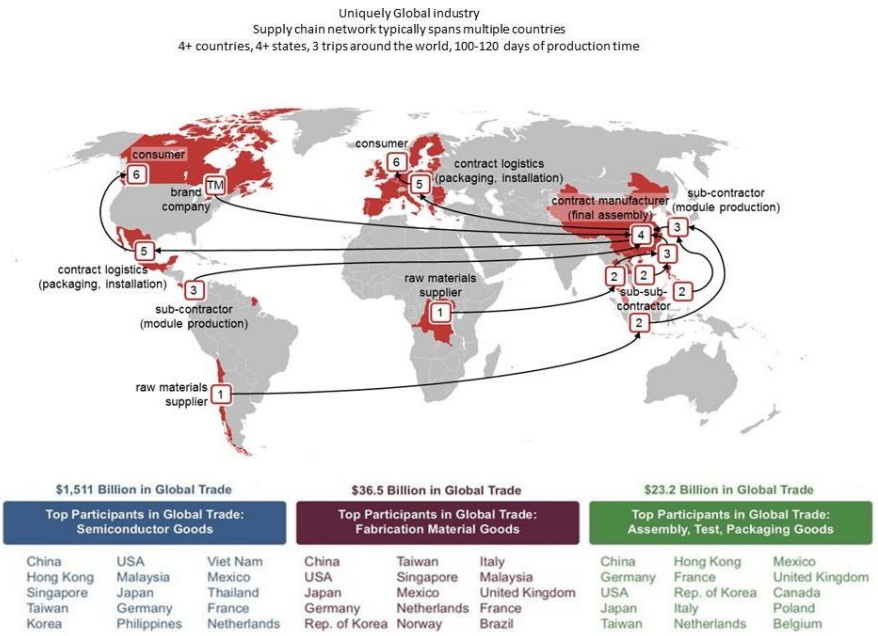
### The Decision/Execution

Businesses may now execute the decision and continue with regular business.

This is a unique example of how businesses can detect risk in their supply chain network using TSCRCT and react to events. In the past businesses were forced to be in reactive mode when such disruptions happened in their supply chain. Harnessing the power of TSCRCT powered by AI/ML, Cloud computing, Oracle Analytics Cloud, Oracle Autonomous Datawarehouse, and integrated with Oracle SCM Cloud business users will now have the levers to support a resilient and robust supply chain.

## 2. How a HiTech Industry can use TSCRCT to reduce risk in IBPx

With fully outsource manufacturing that ensures a lean supply chain to a Hitech industry, they are however also faced the challenge of monitoring if a contract manufacturer is on track with the commitment they promised at the beginning of an S&OP cycle. During the next 30 days, a multitude of events can put these “commits” in jeopardy and contract manufacturers may not react to these effectively or efficiently. TSCRCT can again be used to de-risk the irregularity.



### The Risk

Due to some global events supply from tier 2 suppliers will be delayed. This is one of the key components and may have a serious impact on the committed supply. The Hitech industry uses the supplied commit to promise orders to its customers. Any change of supply commit means an impact on promise dates and hence revenue recognition, on-time delivery, and customer satisfaction.

### The Alert

Any delay in tier 2 supply will be tracked by TSCRCT and contextualized to the MRP data. The Supply Chain organization will be alerted of any lapse in supply commit thereby.

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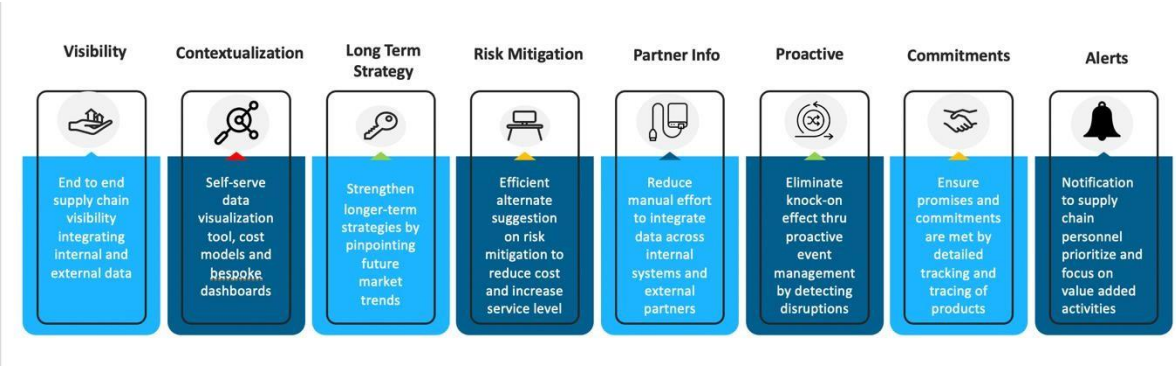
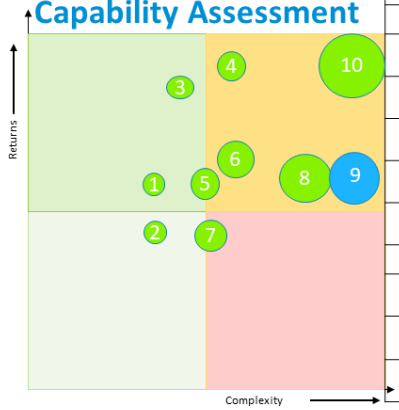
## Other Use Cases

- Predicting Fire and planning for resources and supply to cope with it
- Predicting lead time (Dynamic Lead time Attribution)
  Predicts lead time based on historical, current, and predicted events. Dynamically update lead time to bridge the gap between planning and execution to reduce the cost of sales; Alternatively, the model predicted supply lead-time variability based on internal and external factors for buffer calculation
- Spend Intelligence
  Strengthen competitive purchasing strategy by deriving right purchase price and contract length through AI/ML model considering volatility and future price trend of commodity, currency, and interest rate. Empowers procurement personnel with bottom-up costing and provides insights on cost drivers.




# Capability Assessment

## A comparative study of the capabilities based on complexity, returns & implementation time




| Sr. No | Capability | Timeline (months)* | Complexity | | | Returns | | |
|---|---|---|---|---|---|---|---|---|
| | | | Technology maturity** | Cross functional team involvement | Total | Business benefits | Meets regulatory requirement | Total |
| 1 | Digital Twin | 1 | 3 | 4 | 3.5 | 6 | | 6 |
| 2 | Real-time Monitoring | 1 | 5 | 2 | 3.5 | 4 | | 4 |
| 3 | Cycle time reduction | 1.5 | 3 | 5 | 4 | 7 | | 7 |
| 4 | Inventory Optimization | 3-4 | 7 | 5 | 6 | 8 | | 8 |
| 5 | Dynamic update of planning attribute | 2-3 | 5 | 5 | 5 | 6 | | 6 |
| 6 | Customer and Supplier Profiling | 4 | 7 | 5 | 6 | 7 | | 7 |
| 7 | Post Event Analysis | 3 | 5 | 6 | 6.5 | 4 | | 4 |
| 8 | Predictive Insights across network | 6 | 8 | 7 | 7.5 | 6 | | 6 |
| 9 | Optimal Action Recommendation | 6-9 | 9 | 9 | 9 | 6 | | 6 |
| 10 | Integrated Planning | 9-12 | 10 | 10 | 10 | 9 | | 9 |

*Average duration
**Technology maturity: Higher score implies lower tech maturity & hence increases complexity
Total score calculation: Equal weightage is given to all the parameters

Size depicts time required to implement capability

Control tower opportunities depend on the type of industry, organization strategies, supply chain network, process & technological maturity. The matrix may change depending on each variable

Digital Twin – A digital representation of the physical supply chain that remains synchronized with the physical supply chain when it changes due to internal and/or external events

Real-time Monitoring – All external events (weather, geopolitical, port congestion, etc.) impacting supply chain; prioritized based on severity and level of impact

Cycle time reduction – Latency reduction in highlighting and mitigating risk

Inventory Optimization – Quantify the uncertainty of the supply chain environment and feed variability to IO.

Dynamic update of planning attribute – More accurate predictions of variable attributes in planning to reduce premium cost

Customer and Supplier Profiling - Monitor heartbeat of key accounts and critical suppliers through PESTEL analysis based on supplier/customer market, sector, and industry

Post Event Analysis – Continuous feedback process to improve the accuracy of AI/ML models

Predictive Insights across the network - More accurate predictions of events such as customer order, shipment delays, lead times, and production yield

Optimal Action Recommendation – Define playbook and automate the process for reacting to the disruption

IBPx - Deploy planning analytics in line with the "CORE" model to ensure the different planning decisions required are supported

## Summary

**End to End Visibility** – visibility across supply chain partners, including suppliers, contract manufacturers, transportation carriers, third-party logistics.

**Collaborative information-sharing –** share information and collaborate in real-time.

**Early warning alerts and exception management –** resolve supply chain disruptions before they disrupt your business.

**Predictive and prescriptive decision-support –** using predictive and prescriptive analytics.

**Autonomous decision-making and control** – take the robot out of the human and boost productivity.

**Cognitive** – the self-correcting supply chain with decision-making and machine learning.

## About the Authors

Molly Chakraborty is a co-founder and President of Trinamix Inc. Molly has spent 25+ years in the Supply Chain Industry. Prior to founding Trinamix Molly worked as Development Manager at Oracle as a thought leader in technology and application of Oracle products. Molly is a gold medalist from Jadavpur University with Masters in Electrical Engineering. She has demonstrated leadership in successfully enabling major SCM and Manufacturing initiatives, while taking Trinamix from a small startup to a globally recognized system integrator in the process.

Viral leads the TrinamixI4.0 practice and development of Supply Chain Resiliency Solutions. He has 6 years of experience across industries at strategic & operational roles in supply chain, operations, NPI & manufacturing.He is a graduate student from Northeastern University and has worked at Godrej where he developed & implemented an advanced Supply Chain Network Optimisation solution enhancing performance across departments.



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