Strategic Agility and Absorbing Supply Chain Shocks

Evolving Beyond Extraordinary Reaction to Ordinary Response

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Table of Contents

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Transitioning to Response and Recovery

As the world begins to emerge from the COVID-19 pandemic, business owners and leaders have begun to implement – and in some cases, accelerate – strategic plans to guide their companies out of this crisis. Many of us dusted off playbooks and response plans from previous events, but it's worth taking a moment to determine if we can learn some lessons from the past and improve on them now. What should supply chain leaders do to prepare for the mid- and long-term? How should we think and act differently?

Time to Think Differently

While COVID-19 represents a unique global crisis, the action plans looked a lot like the operational responses to past events going back well over a decade. Historically, supply chains have relied on crisis management and resilience programs, executing a standardized playbook and assembling ad hoc crisis teams to respond to disasters. Such approaches have not fared well over the years, given the model's organizational chaos, manual overhead, and inherently slow reaction times. And in the end, it seems that the answer is always the same – dramatically boosting safety stock to an unsustainable level, causing systemic shortages.

We believe it is time to completely rethink the model, centered around the ability of supply chains to self-heal and be resilient. Here we will look at a different model that focuses on capabilities that build everyday agility that can handle crises systematically. It focuses on building systems that have a real-time understanding of the entire operation, anticipate and advise proactively, and augment human decision-making seamlessly across the supply chains.

Groundhog Day and a Broken Model

We continue to see response patterns similar to previous supply chain events like the 2010 Eyjafjallajökull eruption, 2011 Tsunami, 2011 Thailand floods, 2015 Tianjin explosion, and numerous smaller events like the 2016 Hanjin bankruptcy. The same rush to chaos occurred recently with the Ever Given blockage of the Suez Canal, along with the ongoing semiconductor shortage.

It seems that these extraordinary events are no longer extraordinary. The world no longer has a few black swan events, rather a continuing collection of gray swan operations.

The common thread in all these responses has been a heavy reliance on emergency crisis management teams, large group conference calls, and endless spreadsheets and PowerPoints to manage critical event decision making. While each event was unique when considered individually, a deeper look at these events yields a set of repeating patterns. It exposes inherent weakness in our supply chains:

- The underlying assumption of homeostasis, with spikes (demand, supply, ramp-up/ramp-down) handled outside of the regular process (SOPs)

- The inflexibility of monolithic transactional systems to respond to rapid operational changes, requiring heavy manual intervention

- The inability to re-task data lakes and Business Intelligence projects for unforeseen problems

The bottom line is that systems are almost entirely disassociated with the "questions" for which humans are trying to find answers and are built to define pre-programmed answers. The underlying enterprise structure and slow batch-orientation of supply chain systems supporting this have largely remained unchanged since the 1990s despite major advances in cloud architectures and database scalability.
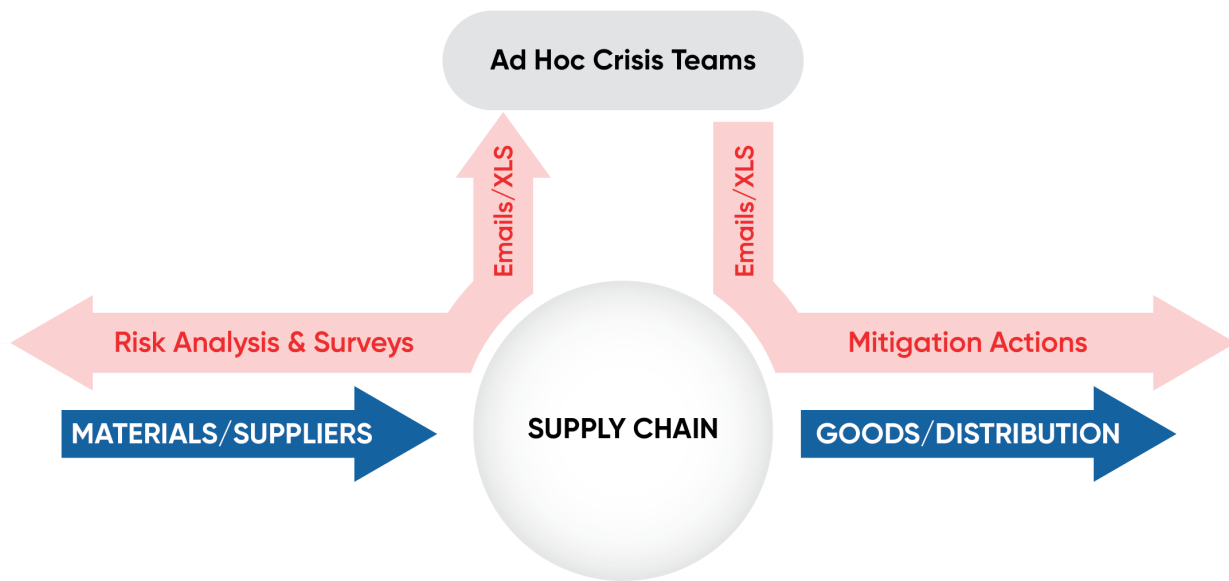
Crisis management for the past two decades centered around conducting surveys, risk analysis, playbooks, and ad-hoc crisis teams around the supply chain. It assumed rare black swan events and accepted the chaos as the cost of doing business.

This exposes the core major problem -- an orientation toward the wrong goal.

Build for Questions, Not Answers

Whether soldiers performing regular PT and exercises, musicians practicing scales and etudes, or footwork drills in boxing, some of the most agile examples of our human experience shows the importance of fundamentals to enable professionals to react to unforeseen enemies, pieces, or hits with alacrity. Rather than focusing on endless situational possibilities, they focus on ingrained capabilities.

For at least the past 15 years, major IT and supply chain technology projects have been oriented around building for specific goals, KPIs, and measurements. Such task-specific efforts are not unlike the mechanical calculators of the computer science eras, from 1800's Babbage Engines to 1940's Bombe Calculators. But progressively, we built modern computer systems with generalized processing that could respond and adapt to a wide range of tasks. Instead of building machines for specific tasks, we built machines with dynamic capabilities to which we could apply different questions.

Transit from the Age of Visibility to Decision Intelligence

Decision Intelligence is the process of digitizing, augmenting, and automating enterprise-wide decision-making processes. If we could redesign our supply chain with this model, we would build it as a series of skills and capabilities that could be re-used and constantly re-ordered to perform more general tasks. Very much like how our supply chain professionals learn fundamental scientific, operational, and management skills in the supply chain and reapply them every day for ever-changing problems and scenarios.

Let's take a moment to make this more tangible using a real-world example: inventory stockout prediction. If you had a professional dedicated to this problem, you would essentially write the job description as:

1. Monitor inventory measurements in finished goods, on-hand, and in-transit. Monitor production output and raw material availability for monitored products. Understand sale orders, work orders, shipment orders, and supply purchase orders to understand potential distressed orders.

2. Predict future inventory requirements based on experience and observed material flow history of elements listed above. Predict real demand, considering consensus forecast, and actual demand via orders. Predict inventory at future dates based on material lead times and expected levels, including customer allocation. Understand data modeling, statistical analysis, and machine learning algorithms and be able to implement them in large-scale transactions and fine-scale granularity.

3. Immediately identify over-sell (and undersell) situations and mitigate actions to correct for predicted shortages early in material flows. Recommend optimal mitigation actions given company service, cost, and revenue goals.

4. Ability to directly act on recommendations below certain thresholds and/or escalate to appropriate management as needed. Must have experience working with carrier systems and TMS, sales order systems, production systems, and internal stock transfers.

In this role, we just built a supply chain capability that solves inventory shortages. But we also gained an asset that could do much more if we just asked it different questions. It wasn't an algorithm for calculating inventory for a specific SKU/location based on a series of fixed formulas. It was a system designed to answer a question: If you see an inventory shortage, what should we do about it?
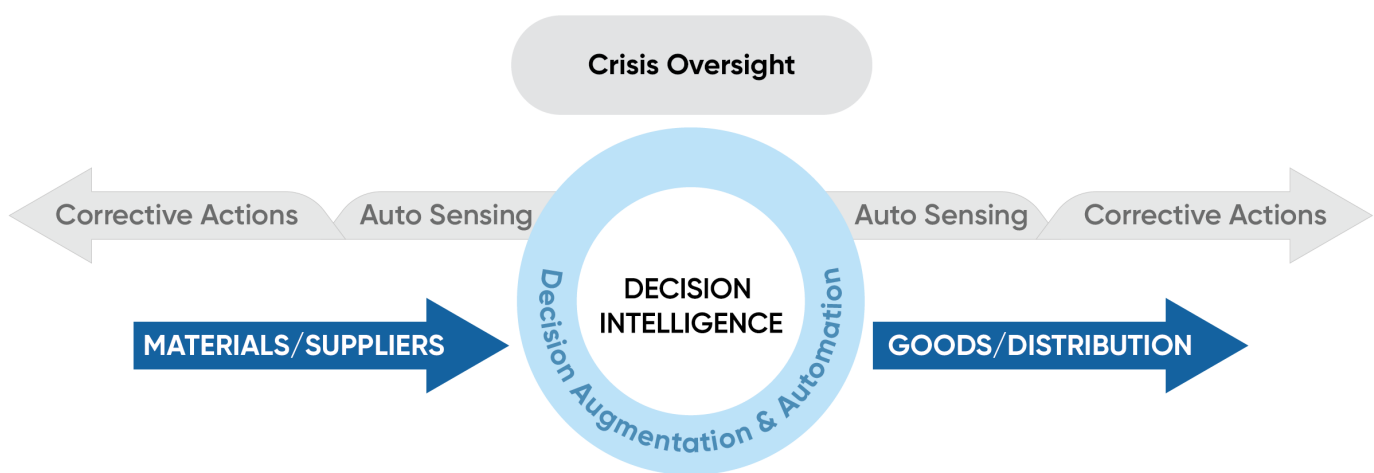
A supply chain powered by Decision Intelligence is capable of adjusting to changes around it. In times of extreme crisis, it automates minor and moderate corrective actions, and augments decision-making that requires humans to make the tough choices.
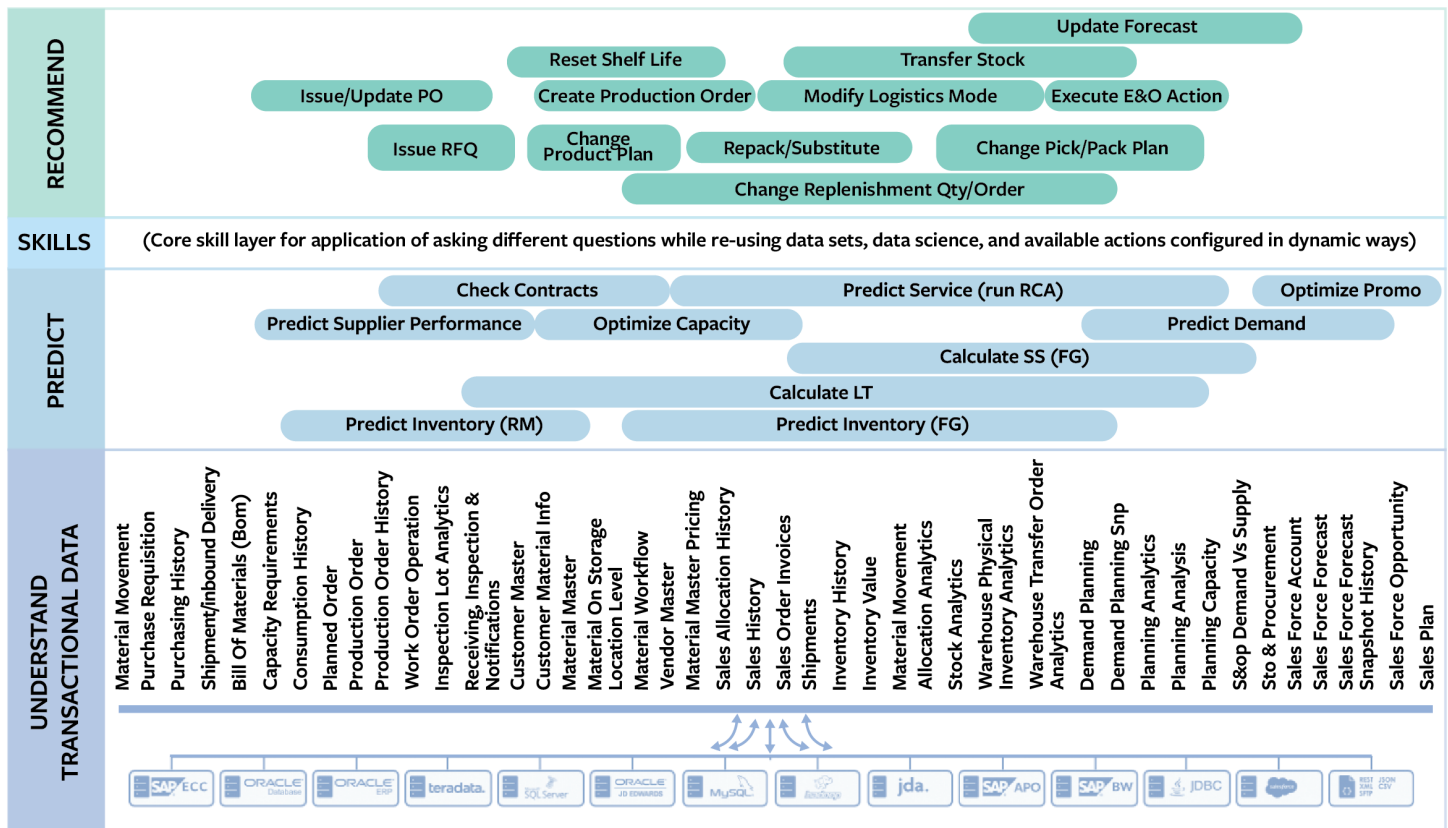
Developing the Skills of Agility

Much like our soldier, musician, and boxer analogy, the new supply chain model is built on foundational skills that can be called upon in different ways. Like a musician who masters chromatic scales and seamlessly sight-reads a Shostakovich piece, our supply chain can adapt to different conditions with an existing set of skills.

Here is how Decision Intelligence builds these capabilities in our example listed above, asking: Do you foresee any inventory shortages, and, if so, how can we resolve it before it's a crisis?

1. Understands: Integrates with existing transactional systems with system-specific communication protocols and target-specific extraction rules. Integrate with ERPs, MRPs, TMS, and other source systems for inventory monitoring.

2. Predicts: Employs continuous data science analysis to predict future inventory levels, timing, and allocation. Predict demand deviations against plan and shortages or excesses. Model various response scenarios and optimize for product-specific business goals.

3. Recommends: Proposes one or more solutions to issues, with full transparency to the logic used.

4. Acts: Automatically executes actions within allowable rules, escalate exceptions according to business rules. Automatically creates and updates required actions in transactional systems.

But guess what? While we've answered our original question, we also built a system that could answer a lot of other interesting questions:

1. What is my current available-to-promise or capable-to-promise data for my products?

2. What is the optimal safety stock given my service levels, lead times, and cost trade-offs?

3. What would happen if my demand goes to zero? What raw material purchase and production runs can I cancel to minimize my exposure?

4. What actions would I need to take if I re-optimized for cash flow rather than revenue growth?

5. What substitutions, orders, and actions do I need to take to shorten the lead time and increase the volume for Y products?

Decision Intelligence employs a re-usable and re-wireable set of capabilities across data, analytics, and action capabilities.

Applying the Skills of Agility:
The Supply Chain Shock Sequence of Questions

Phase 1: Pre-Incident Operations

1. Are there any products currently experiencing a demand spike (negative and/or positive)?

2. What would happen if my demand goes to zero? What raw material purchase, production runs, and more can I cancel to minimize my exposure?

3. Are there products at risk from possible supply shortages, and what are mitigation options?

Phase 2: Post-Incident Operations

1. What actions would I need to take if I re-optimized for cash flow rather than revenue growth?
2. What substitutions, orders, and actions do I need to take to shorten the lead time and increase the volume for Y products?
3. Do I have supplier contracts to cover my material needs and the ability to quickly adjust POs for it?
4. What logistics and inventory options do I have available to stage the right material during ramp-up times to meet surges?
5. What disruptions can I anticipate for non-essential products given shifts of material and production for critical materials?

Phase 3: Recovery

1. What changes to orders and schedules do I need to unwind my emergency measures?

2. Can I reallocate excess inventory or prevent obsolescence as we wind down activities?

3. How is the market returning to normal post-incident and what is the new demand?

4. What do I need to do to continuously fine-tune my supply chain as it returns to normal?

5. What promotional activities can I implement to accelerate revenue recovery?

Each one of the questions above could have been a project unto itself in the traditional, purpose-built model. But in a model designed around questions, the same set of skills is applied toward different queries. That is what Decision Intelligence can mean when we need to turn to our supply chains for help.

In Conclusion

The ripple effects of single-sourced material, supplier force majeure and insolvency, and likely uneven demand resumption patterns are likely to last beyond the end of the pandemic. Let's get ahead of this one. Let's out-think this one. And let's build a model where systems gain cognitive abilities and serve us solutions this time. Then we can not only survive this crisis but also ensure we thrive when we emerge from the other side.

About the Company

Aera Technology is the Decision Intelligence company that makes business agility happen. We deliver a cloud platform that integrates with your existing systems to make and execute business decisions in real time. In the era of digital acceleration, Aera helps enterprises around the world transform how they respond to the ever-changing environment. For more information, visit aeratechnology.com.

Understand.	**Recommend.**	**Predict.**	**Act.**
Continuously crawls enterprise systems and provides end-to-end visibility	Suggests ways to improve financial and operational performance	Leverages real-time data and AI to accurately predict business outcomes, risks, and opportunities	Proactively engages relevant users and drives the execution of their decisions
Secure, low impact, and programmable Crawlers	Opportunity and risk analytics	Embedded AI and machine learning	Autonomously takes action
Internet-scale data management and processing	Analysis at any granularity		Pre-defined process library
Data indexed for search			

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