

Build Decision Agility Now

Faster, More Accurate Decisions are the Key to
Agile, Resilient, and Competitive Supply Chains

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2022



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Designing and Operating Supply Chains in a Volatile World

We now live in a world of two-tier volatility that has a direct impact on the way we design and manage our enterprise supply chains. These two levels are:

1. **Business As Usual (BAU)**, where variability on the demand and supply sides of enterprise supply chains can easily be +/- 40 percent of historical experience. Indeed, volatility of key inputs into the supply chain has been steadily rising since the Global Financial Crisis (GFC), especially on the supply side, as measured by Christopher and Holweg's Supply Chain Volatility Index¹.
2. **Extreme and unplannable disruptions** of enterprise supply chains caused by black swan events are seemingly occurring more frequently, and with greater severity. According to McKinsey², we can expect disruptions of 2+ months every 4.9 years going forward. In these situations, we are seeing variability of +/- 100 percent on the supply and demand sides of enterprise supply chains. The impact on performance of such severe disruptions occurring over a decade can potentially be a loss of up to 67 percent of one year's profits, which is very significant.³

Unfortunately, both these tiers of volatility are exacerbated by decades of relentless focus on cost reduction in supply chains, and the endless search for ever-cheaper products and raw materials from sources further and further away, lengthening supply chains to extreme levels – globalization, by another name.

The COVID-19 crisis put these previous practices under the spotlight, and caused many corporations to stop, rethink, and reset how they design and operate their enterprise supply chains. Business leaders across the world are recognizing that we are now experiencing the most turbulent operating environment in living memory, along with the return of inflation levels not seen for several decades.

The question that has to be answered, urgently, is: **How do we design and operate our enterprise supply chains in these new and very demanding conditions, while at the same time meeting our growth and sustainability targets?**

The first thing we must recognize is that today's enterprise supply chains have three vital dimensions, and all of these have to be worked on, simultaneously, to achieve our desired objectives. These are **network infrastructure, human behavior, and technology**. We will now look at each of these in turn.

Network infrastructure

Responding quickly to otherwise unplanned demand and/or supply fluctuations is a function of capacity; and thus, the decisions to be made relate to designing and managing the appropriate position, types, and levels of capacity throughout the end-to-end supply chain network.

On the **supply side**, this involves strategies such as multi-sourcing, regional diversity, insourcing critical inputs, and strategically locating inventory buffers of key inputs throughout the network.

In **manufacturing**, we have to consider designing in embedded redundancy, such as machine capacity; equipment to enable smaller, more flexible run sizes; diversifying production locations; exploring alliances for outsourcing non-strategic parts of the product range; and embracing postponement techniques to maximize flexibility.

In **logistics operations**, we need protective strategies such as forward booking freight capacity well ahead of shipping date; building collaboration with other parties to share the load; and writing 3PL contracts with buffer capacity.

Human behavior

Nothing happens inside enterprises, good or bad, unless it happens through human behavior of some sort.

If, as we have observed, the survival of enterprises in the future turbulent operating environment depends on speed of decision making, and the rapid implementation of such decisions, we need to design our organizations to facilitate this.

A fast “clock-speed” in the enterprise — faster than competitors and the outside operating environment — will require a change in organization design; reduced and refined processes; individuals and subcultures with higher risk tolerances; and technology that provides the necessary visibility for taking rapid decisions with confidence.

Technology and digitization

To complement the physical and social capabilities outlined above, we need to achieve **end-to-end visibility** across all the supply chains in our enterprise network, at the appropriate level of detail and cadence for the relevant decision-making timeframe. Visibility is built on capabilities such as:

- **E2E digitization** – By mapping all the processes and technical applications that are part of our existing order and fulfillment processes, we can identify and plug any gaps to ensure we have, in effect, a digital twin of our supply chains at the transactional level. And, by utilizing IoT-driven sensing devices at pivotal points across the supply chain network, many of the blind spots can be captured in real time, and thus the chain of custody can be assured.
- **Demand sensing** – Introducing demand-sensing mechanisms to capture lead indicators that can feed into more refined demand forecasting, and provide early indications of potential disruptions.
- **External risk monitoring tools** – Applications such as DHL’s Resilience360 help monitor what is happening to flights and shipping, and the airports and ports they operate from. This information is especially critical for monitoring the flow of inputs and product on the supply side.

And, in order to utilize this visibility, we need sophisticated decision-support tools that enable effective utilization of both infrastructure and people in each planning time horizon.

Embedding Resilience and Responsiveness at Each Decision Level

Supply chain decisions have a time span in which their impact is most felt. It is useful to consider the technology and digital requirements needed to embed resilience and maximize responsiveness at each of four decision horizons.

Strategic level (2-5 years) – This involves building and maintaining a strategic network optimization model of the entire enterprise supply chain network. In multinational companies, this could be a set of models spanning across flows and geographies. Such a model provides a base to factor in and test a range of risk scenarios such as time to recover (TTR)⁴, as well as sustainability considerations.

Tactical level (1-12 months) – While also in the realm of the S&OP horizon noted below, the truly “tactical” decisions that can significantly impact the bottom line in this time period go well beyond the planning tools built for efficient use of resources in a relatively stable market. High-impact decisions such as adding shifts, allocating product or capacity to spot markets, shifting between sea and air modes, all require a model to test various

demand and supply scenarios. Especially in a time of disruption, scenario testing needs to supplement the usual S&OP and forecasting protocols. This is where the enterprise has to be “model-ready” – always having an up-to-date model, ready to run options to address looming issues.

Operational level (1-30 days) – This is where we move into the traditional planning and scheduling space, where S&OP prevails — at SKU level if the demand side is relatively predictable, and at capacity level if the demand side is relatively volatile. Simply having an ERP system and its associated planning systems in place is usually insufficient, because on their own they don’t facilitate fast decision making. More sophisticated predictive tools need to be brought to the table to plan successfully, and to adjust plans quickly under shifting day-to-day conditions.

The other important decision that often has to be supported at this level is the complex task of allocating capacity and product to customers and orders on an established priority basis, especially in times of short supply.

Execution level (live/real-time) – This is where we need real-time visibility spanning the length and breadth of the supply chain network, with data collected instantly and converted into usable information to drive immediate decisions that affect the progress of a customer order.

At this level, the emerging role of the control tower is an example of how people and advanced technology can combine to great effect — in this case, to apply “process control” (well-established in manufacturing circles) to a part of the supply chain. The discipline required to build a digital twin of the enterprise’s operations on the ground at the transactional / executional level comes automatically when you set out to design a control tower for the business. This should be a priority when the enterprise commits to transforming its supply chain capability, and one that is a necessary prerequisite to achieving higher customer satisfaction levels and genuine customer-centricity in complex organizations with many potential failure points.

The Secret Sauce is Decision-Time

Based on observations over three decades of working in the supply chain domain, the essential ingredient for success in today’s highly volatile operating environment is speed: **speed to get to a decision point, and then speed to implement, irrespective of scale.** We have known this for decades, but complexity has been the key barrier. Fortunately, this is no longer the case.

The critical significance of making ever faster decisions first came to light in the Korean War when U.S. Air Force Colonel John Boyd invented the OODA loop⁵ – i.e. “Observe, Orient, Decide, Act.” His concept saved countless lives of USAF pilots in combat with North Korean MiG-15s. In management and technology-speak this translates to focusing on filtering available information, putting it in context, and quickly making the most appropriate decision while also understanding that changes can be made as more data becomes available.⁶

Even today, many decisions are left unmade, which can prove costly over time. Ideally, a decision must be made for every change or exception to the planned course of action. Historically, people have been at the center of the decision-making process. They extract reports, do analyses, and have meetings with other personnel to align and execute agreed courses of action. This situation is untenable in today’s volatile, uncertain, complex, and ambiguous world, where literally thousands of decisions have to be made every day — some big, some small, but all adding up to significant impact on operational and financial performance. In these situations, the OODA loop must run at much higher speeds.

The next era of decision support: How Aera contributes

Imagine if we could transform from an era of people making supply chain decisions, supported by machines, to an **era where machines are making decisions, guided by people**. This is the promise of Decision Intelligence, which Gartner® has also identified as one of its top trends for 2022.⁷ Decision Intelligence requires a platform that's connected outside and in, one that functions in real time and is always on, continuously thinking and learning — and doing so autonomously. Such a platform is necessary to deliver the decision agility and scale required to cope with the rapidly-expanding complexity of today's supply chains.

This is where Aera Technology enters the picture with the Aera Decision Cloud™ platform to enable decision augmentation and automation at scale.⁸ In effect, what Aera has done is develop the modern-day equivalent of the OODA loop.

Aera Decision Cloud accelerates the adoption of Decision Intelligence through the digitization, augmentation, and automation of decision making. The platform continuously adjusts to decision-making needs, from manual to augmented decisions and, finally, by enabling fully-automated decision making.

As an example of the Aera Decision Cloud in action, one Aera customer deployed the Aera Decision Cloud across various critical supply chain functions, starting with visibility — in effect, a cognitive control tower that enabled real-time visibility across the entire organization and all of its data sources. Over time, the customer was able to measure the number of augmented and automated recommendations and the impact (on cost, cash, service levels, and sustainability) that these had on operational KPIs. Today, this manufacturer benefits from continuous planning and modeling of decision outcomes, along with the ability to automate many decisions the team had previously been able to address. In one month for just one dynamic safety stock use case, the customer reported that Aera made over 12,000 recommendations, 74% of which were automatically accepted. They calculated that it would have taken over 40 man-years of staff time to address all of these decisions.

Conclusion: Ever Faster Decisions at Scale

Future success or failure will largely come down to speed — the speed of decision making throughout a corporation's supply chain network. New tools will change the way the infrastructure, people and technology combine, but these will still be the essential ingredients. Planners and management will focus on building and maintaining the frameworks and decision trees for their areas of responsibility; and operators will focus on assessing the recommendations that result for the most important decisions. Many smaller decisions, including those that would never have been made because of lack of resources, will be automated.

For those who develop the priceless internal capability of ever faster decisions at scale, the rewards are enormous. Beyond the obvious impact on efficiency, Decision Intelligence opens new avenues to lift customer satisfaction and grow top-line revenue. In addition, it can make corporate supply chains much more resilient in the face of a more volatile BAU environment, especially when faced with the increasing frequency of extreme disruptions.

References

- 1 See pages 65-68, in Christopher, Martin, and Holweg, Matthias, “Supply Chain 2.0: managing supply chains in the era of turbulence,” IJPDLM, Vol. 41, no. 1, 2011. This index has not been updated in the interim.
- 2 Lund, et al., “Study across 13 industries, 25 largest public companies in each,” in McKinsey Global Institute Report: Risk, resilience, and rebalancing in global value chains, 2020.
- 3 Ibid.
- 4 Simchi-Levi, D., Schmidt, W., and Wei, Y. “From Superstorms to factory fires: managing unpredictable supply-chain disruptions,” HBR, Jan-Feb, 2014, pp. 97-101.
- 5 c.f. Hightower, Tracy A. “Boyd’s OODA Loop and How We Use It,” <https://www.tacticalresponse.com/blogs/library/18649427-boyd-s-o-o-d-a-loop-and-how-we-use-it>
- 6 Lewis, S., “What is OODA Loop?” <https://www.techtarget.com/searchcio/definition/OODA-loop>
- 7 Gartner’s Information Technology Glossary defines “Decision Intelligence” as “a practical domain framing a wide range of decision-making techniques bringing multiple traditional and advanced disciplines together to design, model, align, execute, monitor and tune decision models and processes. Those disciplines include decision management (including advanced nondeterministic techniques such as agent-based systems) and decision support as well as techniques such as descriptive, diagnostics and predictive analytics,” and further notes that Decision Intelligence is “one top trend on the Gartner Top Strategic Technology Trends for 2022.” <https://www.gartner.com/en/information-technology/glossary/decision-intelligence>
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- 8 See interview by Sid Patil with Aera CEO Fred Laluyaux: “Connecting the dots with Decision Intelligence,” in CIO Journal, 13 May 2022; content by Deloitte.

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.

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