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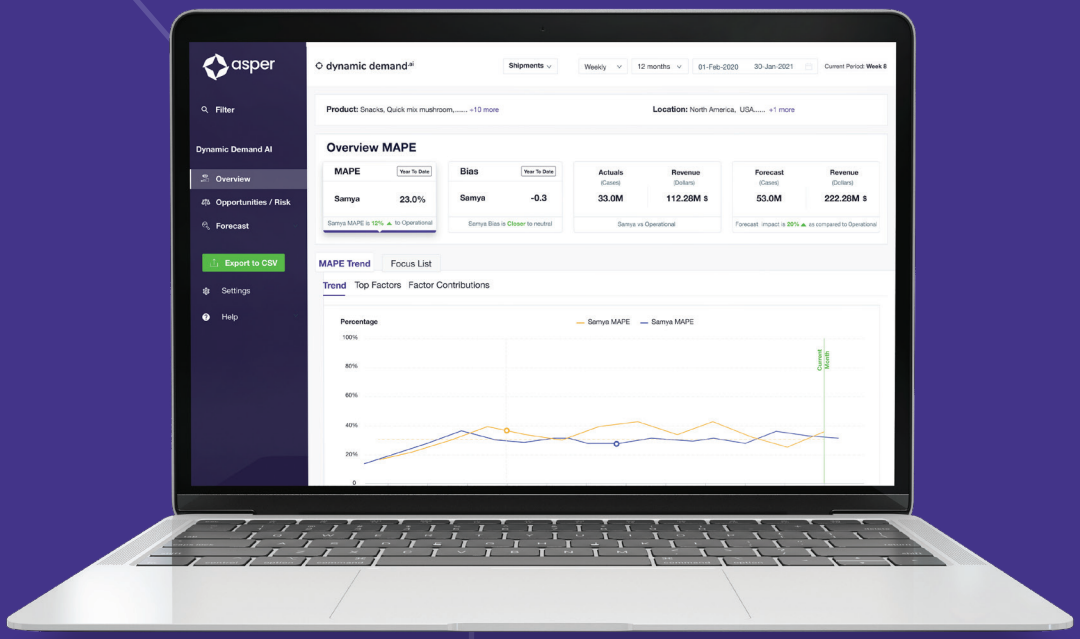



# From Forecasting to Fulfillment: Using AI to Optimize Demand

## Planning and Supply Chain Resilience

The COVID-19 pandemic was a black swan event that put supply chain management and demand planning logistics to the test. Prior to its onset, some businesses were already struggling to adapt to the shifting reality of increased digitization and e-commerce usage. Companies had difficulty interpreting the huge volume of data generated by modern supply chains, leading to visibility issues. And the increasing need for optimized inventory management systems made supply chains more vulnerable to disruptions, tighter production schedules and minimal inventory buffers designed to maximize efficiency. Supply chains became more susceptible to sudden changes in demand, such as pressure from consumers to have orders fulfilled more quickly and conveniently.

The pandemic exposed these challenges in unexpected ways. Lockdowns, travel restrictions, abrupt shifts in consumer behavior, and new market dynamics upended the equilibrium between supply and demand, resulting in shortages, unmoved surplus stock and other challenges.

The 'new normal' saw unparalleled spikes in consumer demand that took many industries by surprise. For some industries such as travel, demand volatility was particularly dramatic, as it saw an immediate dip, followed by massive spikes when lockdown protocols were lifted (though baseline consumer demand and search trends around travel were lower than pre-pandemic standards). Airlines, hotels and other travel providers were forced to cancel flights and reservations, leading to significant losses and disruption. The on-demand grocery industry also saw a sudden demand for home delivery, which put pressure on supply chains as companies struggled to keep up during quarantine periods. The same was evident in demand for PPE, which strained medical supply chains that were unprepared to meet public needs, resulting in widespread shortages and price gouging

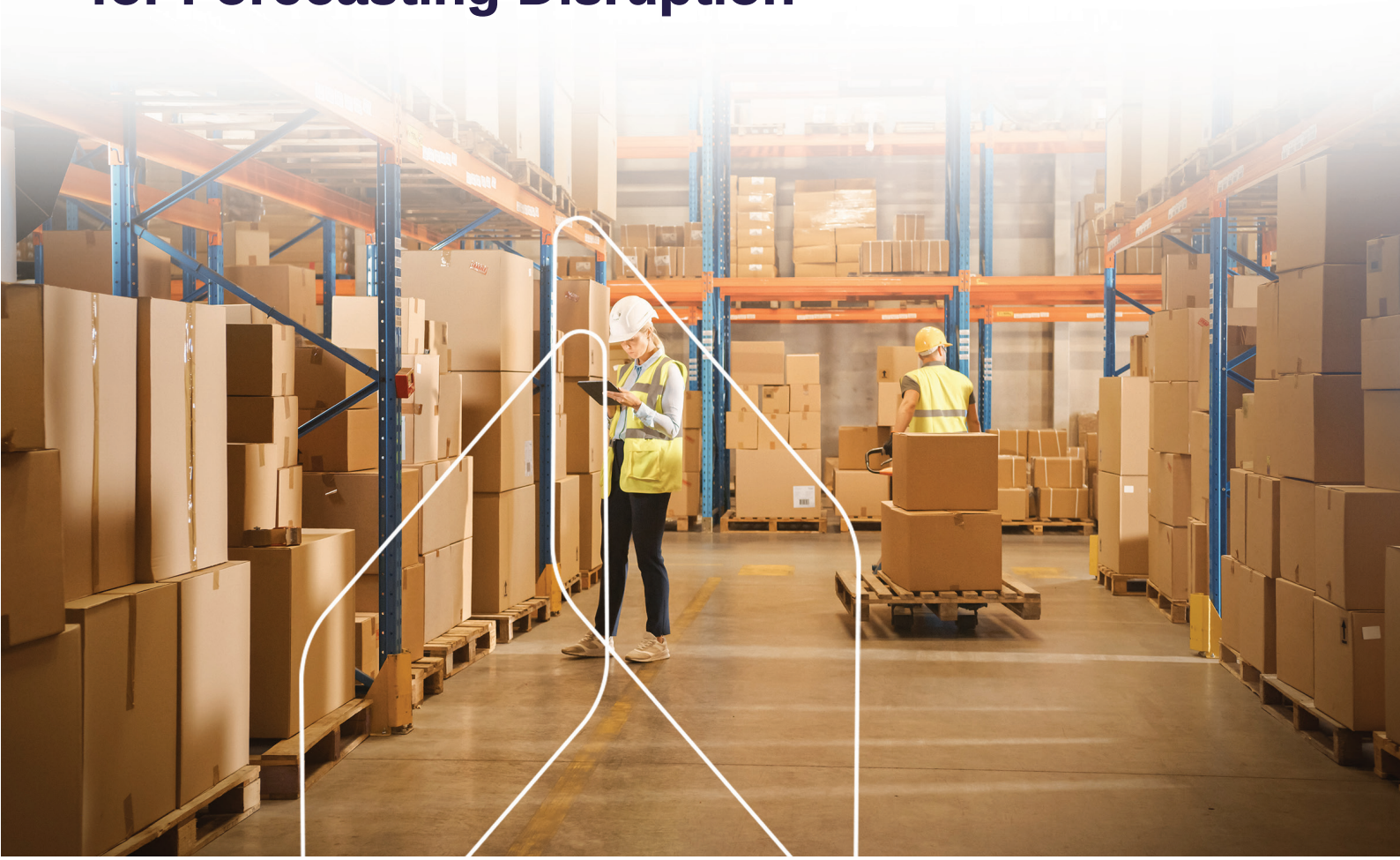
## The Demand Planning Roundtable

In January 2023, Asper hosted an exclusive executive roundtable session with industry leaders from Consumer Goods representing supply chain, finance and technology. It was led by senior Asper leaders to discuss novel approaches to data and AI to modernize demand planning logistics and reinforce business supply chains to minimize future disruption as a result of unprecedented challenges (e.g., COVID-19, recession, inflation and more) and unconstrained demand. The group convenes periodically to share leading practices and discuss issues in a collaborative environment.

This paper provides an overview of the February session. Due to strict confidentiality assurances, no names or details about specific participants or their companies are mentioned here.

Global market conditions are also facing new challenges, including recessionary woes, rising inflation and more. Companies must rapidly adapt to these conditions while supporting customer needs. This requires robust data intelligence and state of the art artificial intelligence and machine learning algorithms to anticipate and respond to unexpected events. When intelligence, agility, data and technology come together – anchored by sophisticated data analytics – the result is end-to-end visibility across global supply chains. Real-time scenario planning can assess the impact of potential disruption using leading data indicators and help manage unforeseen risks caused by changes in the environment and the global economy, consumer behavior shifts or extreme weather events like hurricanes, wildfires and drought.

# Supply Chain AI is a Growing Priority **for Forecasting Disruption**



Amid salient disruption trends among key industries, e-commerce – led by Amazon – was seemingly insulated from major elasticity. Consumer search behavior stayed constant before, during and after the pandemic's peak. According to a recent write-up by Amazon's marketing team, the company specifically implemented machine learning to "**predict demand for millions of products globally in seconds**" assessing historical trends, sales projections and independent research for larger product movement. When sales of goods like toilet paper surged by 213% during COVID, Amazon used AI-driven predictive forecasting to respond quickly to customer demands using data collected via Amazon Web Services (AWS) to build machine learning models.

Today, data is everywhere. And companies across myriad industries are increasingly seeing the value of better

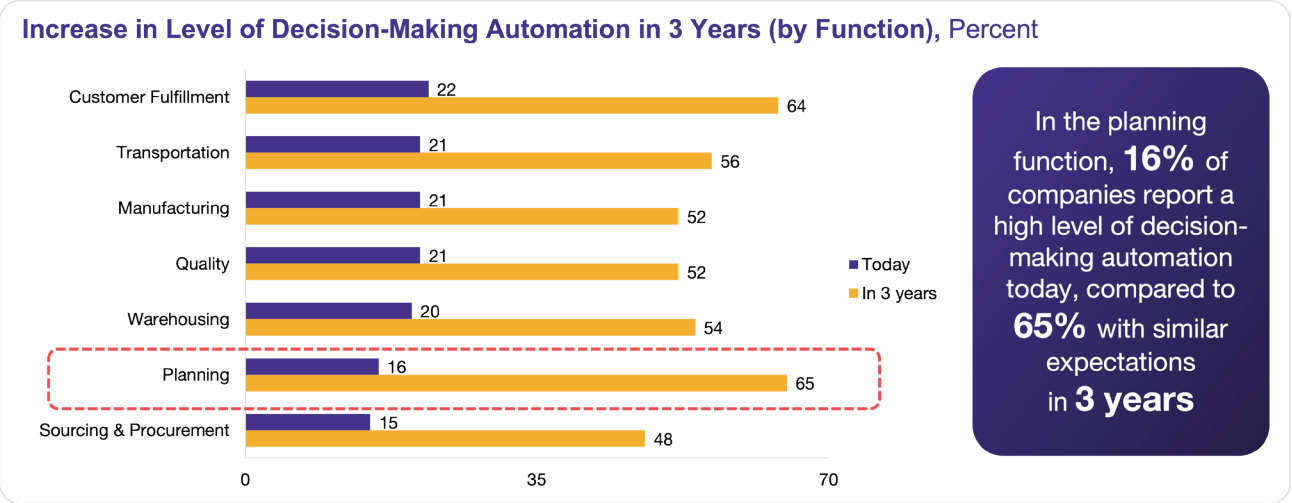
understanding the data they collect from consumers and throughout the supply chain. To maximize that value they must operationalize it for better decision making across every stage of the demand planning process. By implementing AI and data analytics, businesses can better monitor the external factors affecting supply and demand, better predict consumer behavior, and correlate it with the potential for disruption events. The use of AI as part of supply chain management is no longer an aspiration. It's a well-defined goal for leaders that has become table stakes for optimizing operations today and in the future. Industries must start using AI to do the following:

- Rapidly identify patterns and relationships in large datasets by incorporating granular customer-level data to identify risks and opportunities, such as fulfillment delays and inventory management.
- Use algorithms to bring together consumption data to analyze historical sales metrics, evaluate unfilled demand and create more accurate demand forecasts.
- Automate low-risk decisions to increase business efficiency and reduce supply risks by freeing up resources to better understand demand forecasting trends and create more sustainable demand planning models.
- Anticipate new consumer trends by understanding customer preferences and behaviors in a baseline scenario to account for changes in demand via external events that can shape supply and demand trends.

According to a Gartner study, 16% of businesses say they now use a high level of decision-making automation, and 65% expect to do the same within three years.

# Supply Chain
# **AI is a Growing Priority**

**The use of AI is no longer an aspiration, but a well-defined goal for supply chain leaders**




**Source**: 2021 Gartner Sustaining a Customer-Centric Digital Supply Chain Ecosystem Survey

These findings track, considering that demand planning has traditionally been a manual process  increasingly ripe for transformation through automation. In fact, in the case of a leading CPG company, the business needed to rank and choose their carriers using a variety of factors and outcomes. Using AI, it identified a $1MM savings opportunity per category and across transportation lanes. This improved warehouse planning and shipment processes, cutting overhead costs overall. Effective demand planning in our current reality needs to make use of AI and data to reduce costs, locate inefficiencies, and forecast effects that would otherwise be impossible or too expensive to predict manually.

# How Can Companies Deploy and **Intelligently Implement AI?**

For business leaders to make the case for implementing AI in their organizations, they'll need to find the other leaders who are willing to come along and help iterate AI models. To get AI to deliver on its potential, leaders should start by clarifying value outcomes, then find the right

applications for AI along the path toward those outcomes. This approach can bring the business closer to its goals and solve for pre-existing inefficiencies. Those stakeholders will then become advocates for the technology, transforming processes throughout the business that impact the bottom line.

We can look at the case of a leading sporting goods company which wanted to solve complexities around retail fulfillment for BOPIS and ecommerce services. By automating inventory management and using the technology to recommend inventory guidance based on historical data, the business reduced fulfillment costs by 20%. Here, AI helped plan for demand while reducing shipping time, leading to a 40% increase in one-day shipments. This instance shows how applying AI/ML modeling across multiple interrelated business functions can align relevant data across those functions, discover otherwise hard-to-locate areas to improve inefficiencies, and ultimately elevate customer satisfaction.

Deployment of AI and data analytics tools, however, require a deeper understanding than simply slotting new solutions into a tech stack and seeing what happens. Organizations must fundamentally change the way they view problem-solving, specifically implementing the following processes:

## Rewire the organization.

Leverage AI for value generation and making timely decisions; to act on risks and opportunities; and understand unconstrained demand.

## Digitize the supply chain.

Deploy scalable, interconnected AI-powered technology to scale across business units and regions.

## Transform processes.

Digitize user journeys, enable automated decision-making, prioritize value adds, and integrate AI into processes end-to-end

## Make change happen.

Open up cross-functional collaboration and transparency, sharpen employees' skills, and enable self-serve tools.

A critical component for preparing a business to generate value from AI/ML and data analytics tools requires a cultural shift in the way employees and leadership understand the technology's limitations and advantages, as well as the processes for effective implementation. When deploying these tools for supply chain management, for example, companies should identify a narrow scope of improvement and iterate the depth and scale of the models and algorithms they're using until they yield accurate results and value. High-quality data is also essential, along with data governance processes. Together they will ensure data quality, guide customers through difficult market conditions and help reduce risk by enabling a real-time view into supply availability, market shifts and fluidity of global conditions that influence demand.

# Meet our **leaders**

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