The AI-Driven Supply Chain: Seamlessly Meeting Complex Demand

By Tim Denman and Jamie Grill-Goodman

Learn How Retail's Elite Are:

Advancing Assortment and Allocation

Perfecting Demand Planning & Inventory Management

Furthering Fulfillment

Retail supply chains have become overwhelmingly complex. In order to meet constantly shifting consumer demand and ensure product is where it needs to be, when it needs to be there, savvy retailers are turning to artificial intelligence (AI) to help power their next-gen supply chains.

The instant an order is placed the countdown to delivery begins, and retailers must be able to pinpoint the quickest and most economical way to fulfill it. These vital decisions require sophisticated AI solutions that are able to instantaneously examine inventory levels, delivery distance, weather, fulfillment options and local demand to arrive at the most cost-effective delivery solution. In addition, artificial intelligence can make vital assortment, allocation and inventory decisions at a localized level based on an infinite number of factors.

Retail's leaders have begun infusing their supply chains with artificial intelligence and are reaping the rewards, and those that haven’t are frantically trying to catch up. Keep reading to learn how the early adopters are leveraging this game-changing technology to set their supply chains apart from the competition and meet constantly changing customer demand.

ADVANCING ASSORTMENT AND ALLOCATION

The ability to move products quickly, efficiently and economically is the calling card of a well-run supply chain. But it is simply not enough in today’s highly-competitive retail landscape. Cutting-edge retailers rely on smart supply chains that are not only able to transport shipments, but are equipped with the power to predict and meet demand in real-time.

To ensure they are able to meet demand whenever and wherever it strikes, leading retailers are designing and deploying supply chains powered by artificial intelligence. The use of AI is on the rise throughout the retail enterprise, and is flat-out booming in the supply chain. In fact, the AI supply chain software market is currently valued at about $700 million and is expected to balloon to more than $10 billion by 2025, which amounts to an annual growth of approximately 45%, reports MarketsandMarkets.

$10B

Value of the AI in supply chain software market by **2025**.

Source: MarketsandMarkets

AI Helps Morrisons Ensure In-Demand Products Are On Shelves

Investment dollars are clearly pouring into the supply chain, but where is this increased investment being spent? Leading retailers like Morrisons are fortifying their supply chains with AI to improve demand planning and streamline replenishment based on localized customer behavior.

The UK grocer's AI-powered supply chain can make **430 million calculations and 13 million automatic decisions every single day**, allowing for far greater on-shelf availability of in-demand products. The granularity of the insight allows Morrisons to enhance the customer experience at the store level. The solution allows the grocer to assort and allocate its stores based on a clustered approach to inventory planning and replenishment, incorporating store-specific factors like shelf size and consumer buying patterns at the hyper-local level.

> *THE SYSTEM IS CAPITAL LIGHT, UTILIZING CLOUD TECHNOLOGY AND STORE SPECIFIC HISTORIC SALES DATA TO FORECAST STOCK REQUIREMENTS. IT IS REDUCING COSTS AND STOCK LEVELS, WHILE ALSO SAVING TIME FOR COLLEAGUES, AND PROVIDING A BETTER OFFER FOR CUSTOMERS.*

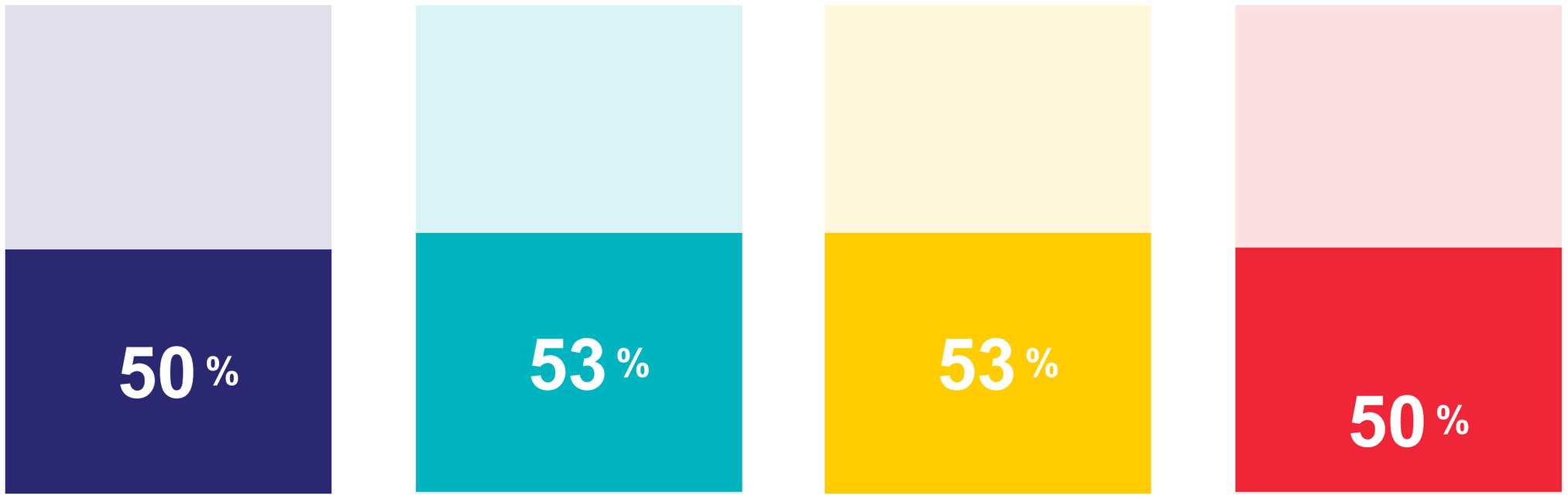
DAVID POTTS
CEO, Morrisons

The results speak for themselves. Since infusing its demand planning functions with next-gen AI solutions, the grocer has improved its shelf gaps by more than **30%** and reduced stockholding in stores by two to three days on average.

Retailers like Morrisons are blazing the AI-powered supply chain trail and their success has not gone unnoticed by the industry. **Seventy-six percent** of retail winners and **57%** of all others rank the ability to automatically replenish stores as a high-value capability, according to RSR.

Retailers Are Split On The Importance Of Reinventing The Supply Chain

Despite the clear advantage of next-gen, data-centric approach to demand planning, much of the industry is dragging its feet equipping themselves with the technology needed to make it a reality. In fact, 50% of retailers say that their systems are not capable of the levels of localization that modern retail customers demand, says RSR.



report that their systems are not capable of the level of localization that consumers demand

state their company is reluctant to change what it considers its core capabilities

say all this talk of new consumer demand is overcomplicating the discussion

believe the industry's reliance on data is destroying the art of retail

Source: RSR, "Mastering The Art Of Merchandising In The Technology Age"

PERFECTING DEMAND PLANNING & INVENTORY MANAGEMENT

Managing and planning inventory remains one of retail's biggest challenges. To meet this challenge, **85%** of retail companies plan to use intelligence automation for supply chain planning and demand forecasting by 2021, according to "The Coming AI Revolution in Retail and Consumer Products."

> **Every city or neighborhood is unique, with its own highly localized flow of people, places and events that shape consumer behavior and demand," the report explains. "A store in a college town requires different product assortment than a store in a resort area. Intelligent automation can learn from local data to determine products and services that serve the needs of the neighborhood. Based on local venue characteristics and available ingredients, it can automate assortment selection for a particular store.**

Additionally, in the case of bad weather and unfavorable road conditions, systems equipped with intelligent automation can reroute shipments to avoid delays as needed.

> **By automating processes using advanced algorithms, companies can be better equipped to meet customer demand, maintain service levels and handle unexpected events with agility," the report notes.**

81%

Retail and consumer products executives expect to reskill and retrain employees as they implement intelligent automation capabilities into specific functional areas. This could include training employees how to use customer insights so they can offer more personalized services or equipping merchandisers with tools that allow them to create more targeted inventory plans.

Source: IBM Institute for Business Value & the National Retail Federation, "The Coming AI Revolution in Retail and Consumer Products."

Leveraging geographical analytics to gain a holistic view of local demand is no easy task and requires sophisticated machine learning and artificial intelligence engines fueled by big data. Forty-four percent of retailers believe using AI technologies to analyze geographic-location data will transform every part of their businesses, according to RSR.

"When you think in terms of omnichannel you create routing rules for orders to ensure you are picking items that are best for customer and best for the retailer with the highest margin," says Ron Edwards, COO, Cole Haan. "You ship from warehouses, ship from stores, ship from store to store, do digital returns, endless aisle and apply machine learning to safety stock. When you do this you liquidate your seasonal inventory quicker, lower mark downs, increase revenue and achieve a fast ROI."

Carrefour Reduces Waste With AI

French multinational retailer Carrefour is one example of a retailer using AI to meet the challenge of inventory optimization. The supermarket chain is collecting and processing data from stores, warehouses and e-commerce sites. Analysis of the data improves downstream forecasting and upstream ordering with suppliers, reducing waste and overstocks.

Following an 18-month test period, the AI-powered supply chain implementation, which is said to be a first for the French retail sector, will be deployed at Carrefour to allow procurement and replenishment teams greater agility for integrating working methods and continuously improving forecasting processes. The solution stores and processes large volumes of data and will allow Carrefour's experts to develop tailor-made algorithms to meet their specific needs.

"ARTIFICIAL INTELLIGENCE WILL FREE UP TIME FOR OUR TEAMS TO FOCUS ON DEVELOPING DIFFERENTIATED FORECASTING STRATEGIES AND BEST MEET OUR CUSTOMERS' EXPECTATIONS WHILE REDUCING WASTE.

FRANK NOEL-FONTANA
Forecasting Director, Carrefour France

FURTHERING FULFILLMENT

AI has been steadily reshaping what is possible in fulfillment both inside the warehouse and out. As shoppers begin to expect next-day delivery and speedy buy-online-pickup-in-store fulfillment options, sophisticated technology is needed to collect and deliver inventory.

Ocado Artenership Brings Automated Warehouses To Kroger

inside the warehouse, Kroger and online supermarket Ocado have developed an exclusive partnership agreement in the U.S. to bring the Ocado Smart Platform to the country for the first time, which includes ordering, automated fulfillment and home delivery capabilities.

Kroger has committed to building 20 Ocado-powered customer fulfillment centers (CFC) to accelerate its fulfillment capabilities. The CFC model is an automated warehouse facility where customers' orders are picked and packed using swarms of purpose-built robots. These robots are capable of collaborating to pick a typical 50-item order in a matter of minutes. This process makes up part of the Ocado Smart Platform, which uses applications of AI and machine learning.

> *KROGER IS EXCITED TO PARTNER WITH OCADO - ONE OF THE MOST INNOVATIVE, ADVANCED COMPANIES IN THE WORLD - TO REDEFINE THE GROCERY SHOPPING EXPERIENCE FOR CUSTOMERS ALONG THE EAST COAST.*
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> **RODNEY MCMULLEN**
> **CHAIRMAN AND CEO,** Kroger

"For our customers, our adoption of AI and ML helps them shop faster with less friction and greater delight," writes Ocado CTO Paul Clarke, Ocado, in the Harvard Business Review. "We are able to personalize the experience to better fit their individual shopping styles. From our perspective as a retailer, we are able to predict the demand of the 50,000 different products we sell, detect fraud, and keep our customers safe, as well as manager the real-time control and health of the robot swarms and optimize the thousands of deliver routes that we drive each day."

59% Retailers named pressure from competitors to achieve faster fulfillment to consumers a top business challenge in 2018, up 15% from 2017

Source: RSR, "Supply Chain Management 2018: In Service of the Customer"

Once an order is ready to head to the customer, artificial intelligence plays a large role in the last mile. Highly sophisticated of factors, including inventory, demand, and weather. UPS, for example, optimizes delivery routes through an AI-powered navigation tool called ORION (On-Road Integrated Optimization and Navigation).

Amazon, which has many logistics contracts for delivers, including UPS, also uses an app known as Flex to hire drivers for deliveries.

> **The process relies on AI to constantly calculate how many drivers are needed at any given time," NPR reported. "The app considers the weight and number of packages headed to the same neighborhoods and whether packages can fit in one of the available cars. The app even recommends the orders of packing boxes into a car for the most efficient delivery."**

In addition to speeding delivers to shoppers, AI can improve the movement of inventory to stores and warehouses. Transportation, with AI, can factor in things like driver's history, truck condition, variable traffic along driving routes, road conditions, weather, and more.

> **Each of those variables has captures data that has a statistical impact on the desired outcome: an on-time and safe delivery," writes the Coca-Cola Retailing Research Council. "The data is also highly dynamic, changing over time and circumstances to which AI is constantly reevaluating and trying to expand into other relevant information that may help to further refine assessments."**