

AI and technology: Enabling complex omnichannel fulfillment strategies

By Dr. Eva Ponce and Laura Allegue

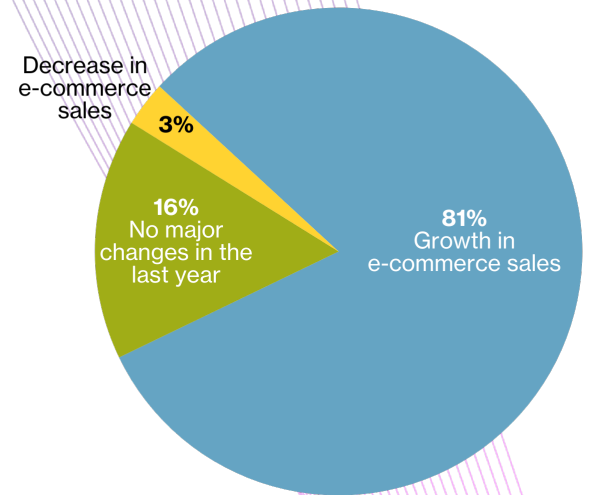
As e-commerce sales expand, organizations are increasingly turning to automation and AI-enabled technologies to manage the rising complexity of omnichannel operations. From inventory allocation across multi-node networks to meeting customer expectations for speed, convenience, and personalization, companies are leveraging AI to enhance forecasting accuracy, optimize inventory, and improve fulfillment operations.

For the past four years, the Massachusetts Institute of Technology Center for Transportation & Logistics (MIT CTL) has conducted an annual study to determine how omnichannel is transforming retail supply chains.

This year's study – based on a survey of 647 supply chain professionals – examined how companies are evolving their omnichannel strategies, managing operational complexity, and leveraging AI-powered tools and emerging technologies to address their most pressing challenges.

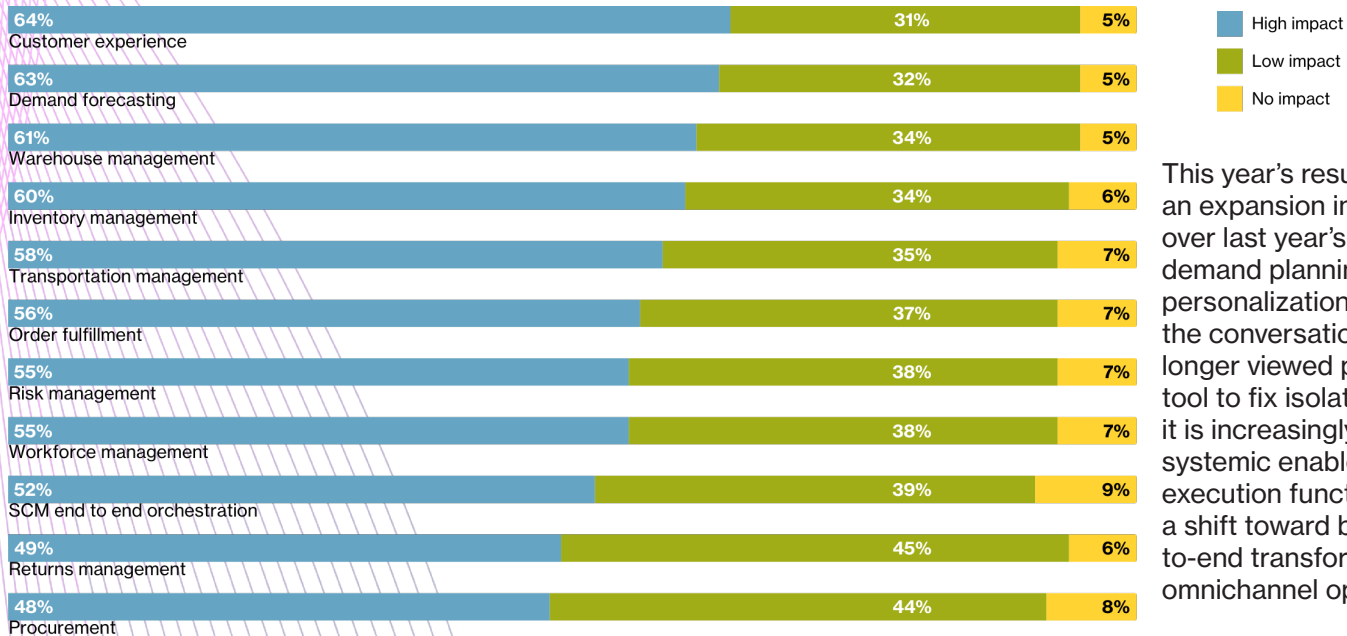
The results indicate that AI tools are becoming more deeply embedded in core operational processes, emerging as foundational to how omnichannel supply chains operate and compete.

Trend in e-commerce sales in 2025



Where do you see AI having the greatest impact on omnichannel fulfillment?

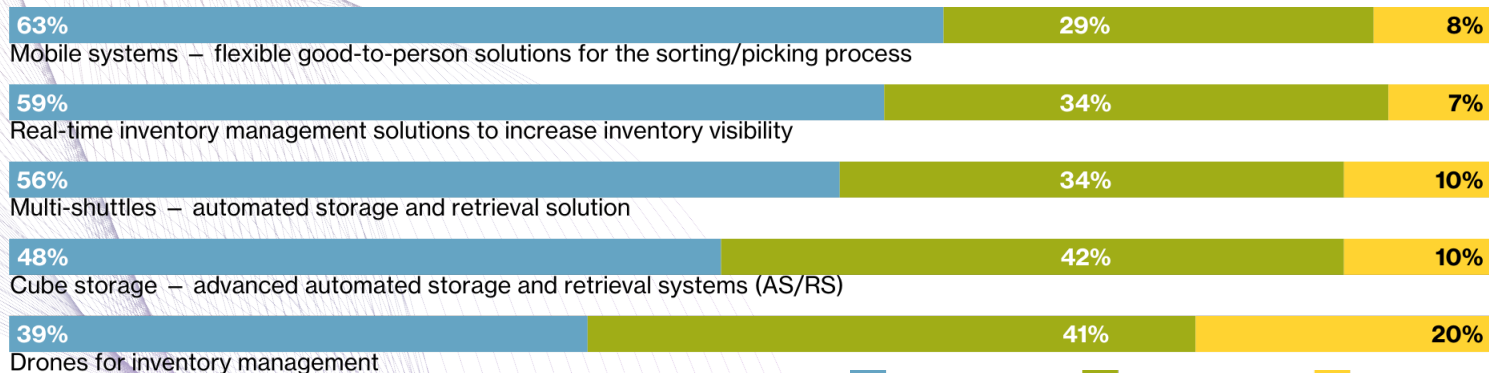
(% of responses, multiple answers accepted)



This year's results show an expansion in scope over last year's (in which demand planning and personalization dominated the conversation). AI is no longer viewed primarily as a tool to fix isolated pain points; it is increasingly seen as a systemic enabler across core execution functions, signaling a shift toward broader, end-to-end transformation of omnichannel operations.

Relevance of supply chain technologies in omnichannel fulfillment

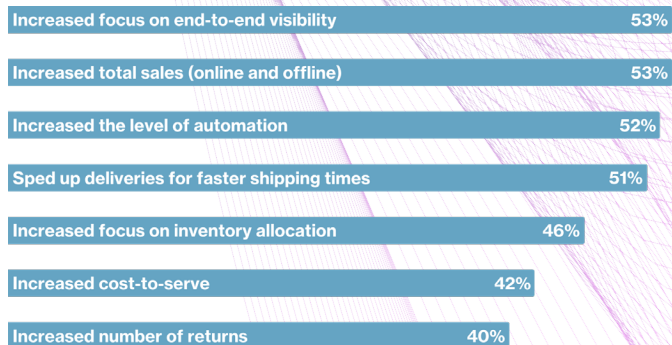
(% of responses, multiple answers accepted)



The survey data points to a structural shift toward more automated, data-driven fulfillment models. Organizations are moving beyond standalone pilots and increasingly deploying scalable technologies such as autonomous mobile robots (AMRs) to improve speed and accuracy, while also investing in data-driven systems that enhance inventory visibility.

Ways in which e-commerce sales have impacted your supply chain

(% of responses, multiple answers accepted)



This year's results show a more balanced and cost-aware impact profile over previous years, suggesting that foundational digital capabilities are becoming embedded rather than expanding at the same pace. Companies are moving from building capability to managing margin and improved business performance at scale.

Which pain points are having the biggest impact on omnichannel distribution strategy development?

(% of responses, multiple answers accepted)



The survey results show pain points converging across execution fundamentals. The most notable shift since last year is in demand planning; while it previously stood out as the chief pain point, it has now converged with other operational pressures. At the same time, allocating operational costs to each channel increased significantly.

Top supply chain areas affected by e-commerce growth

(% of responses, multiple answers accepted)



The data shows a tighter clustering among categories, suggesting a convergence around execution. Sustainability increased significantly since last year, and returns management continued to climb.

About the study

The survey was conducted by Dr. Eva Ponce, founder and director of the MIT CTL Omnichannel Supply Chain Lab, and Laura Allegue, digital learning specialist at the lab, from November 2025 to February 2026. To learn more about the study's results, contact Dr. Eva Ponce at eponce@mit.edu.

More details about the sample: Most respondents hold senior leadership roles, with 44% serving as vice presidents and 22% as senior directors, and most represented either manufacturers (32%) or retailers (25%). Most represented industries are: transportation and warehousing (31%), food & beverage (22%), electronics (19%), beauty and personal care (18%) and fashion (16%). Most of the companies (72%) have 1,500 or more employees, and one-third have more than 5,000 employees. Finally, nearly 80% of respondents are implementing or planning omnichannel strategies, reflecting a 10% increase compared to the previous annual report.

Dr. Eva Ponce is the director of the MIT Omnichannel Supply Chain Lab, and Laura Allegue coordinates the MIT CTL Online Education Corporate Edge at the MIT Center for Transportation & Logistics.