57% of Organisations Expect AI to Make More Than a Quarter of Warehouse Operational Decisions Autonomously by 2028, MIT CTL–Mecalux Study Finds



More than half of organisations (57%) expect AI to make or execute more than a quarter of their operational warehouse decisions autonomously by 2028, and 90% expect to increase their AI investment over the next two to three years. These are among the findings of The state of generative and agentic AI in warehouse operations, a new global report from the Intelligent Logistics Systems Lab at the Massachusetts Institute of Technology (MIT) Center for Transportation & Logistics (CTL) and Mecalux. Drawing on responses from nearly 2,000 experienced supply chain and warehousing professionals across 21 countries, the study examines where generative and agentic AI are deployed, which applications deliver results, and how businesses manage autonomy and oversight as adoption grows.

Adoption is already high, with 61% of organisations reporting use of GenAI at large-scale deployment or full integration, compared with 56% for agentic AI. Most applications are still young, however, as about three in four have been at their current deployment stage for less than a year.

Reported value is also widespread but not yet well documented. Among the use cases respondents described in detail, 87% of GenAI and 81% of agentic AI applications show at least moderate improvement in their target metrics, yet only 39% of GenAI and 36% of agentic AI use cases have significant gains that have been quantified and documented. Where respondents could estimate the gain, the typical figure was around 20% on their main target metric.

AI Agents Gain Authority Within Limits

As for autonomy, companies are giving AI agents real authority, but within clear limits. Agents most often make decisions without human approval on inventory movements (51% of agentic use cases) and data corrections (42%), while only 22% are permitted to make customer-facing commitments and 12% to make financial decisions. The most common oversight model is “human-on-the-loop”, in which AI operates within defined limits while employees monitor and can step in. “The objective is to move beyond general sentiment and to provide practical guidance on where these technologies are delivering operational value today and where they remain experimental,” said Matthias Winkenbach, Director of the Intelligent Logistics Systems Lab.

Strong Governance Supports Better Results

When comparing the organisations that document results with those that do not, governance and integration appear to separate them. Businesses with comprehensive, actively enforced AI governance are about twice as likely to report significant, documented improvements: 51% versus 26% for GenAI and 46% versus 23% for agentic AI. The pattern holds after controlling for deployment status, region, industry and budget, though the report notes that this reflects association rather than proof of cause. The largest obstacle to companies’ use of GenAI remains integration. Forty percent of respondents name legacy-system integration as the top constraint to scaling GenAI, and 54% say better integration with warehouse management and ERP systems would make the biggest impact to accelerate adoption.

Investment and Autonomy Expected to Grow as Roles Evolve

Looking ahead, nearly a third of organisations (29%) expect to raise their AI investment by more than 25% over the next two to three years. The share expecting any increase (90%) is in line with last year’s study (87%). Among companies that have fully integrated these technologies, 70% expect agentic AI to make or execute more than a quarter of their operational warehouse decisions autonomously by 2028, compared with 57% overall.

For the workforce, the report finds that AI is changing jobs more than eliminating them. Fifty-six percent of organisations say AI has mainly shifted employees towards higher-value tasks, while 11% report reduced headcount and 9% report increased headcount. Seventy-three percent are upskilling warehouse-floor staff, and 61% are creating new technical roles.

For companies still deciding where to begin, the report recommends establishing clear governance before expanding adoption, treating data quality and system integration as core work rather than side tasks, and reviewing results over the first 12 to 24 months before assessing whether to expand or stop an application. “Warehouse decision-makers need AI they can measure. This research gives our clients a clear map of where the technology is working today and what it takes to prove it,” said Javier Carrillo, CEO of Mecalux.
The full report is available for download at www.mecalux.com/mit/report-ai-warehousing-2026-pdf