Retail Meets AI:
Re-envisioning Stores
and Supply Chains

Microsoft | **NVIDIA.**

Few industries are under the competitive pressures that retailers experience. Razor-thin margins, complicated supply chain and shifting consumer behavior patterns stress even the most successful organizations. Fortunately, advances in artificial intelligence (AI) bring solutions to retail that can increase agility, improve forecasts and power the rich, omnichannel experience that savvy customers demand.

This paper examines the rapidly evolving use cases for AI in retail and highlights what retailers should look for when selecting AI solutions to modernize both connected stores and supply chains.

The Pressure on Retail

The retail industry is experiencing one of its biggest shifts in history. The pandemic amplified changes that were already taking place, as consumers accelerated their adoption of e-commerce and expectations for improved convenience. One of the most important shifts is consumers' increasing demand for a consistent and easy omnichannel experience, allowing them to engage with brands across channels and purchase when, where and how they'd like.

In parallel, the retail supply chain has come under unexpected pressures of its own. No retailer can predict how the next trade agreement, ransomware attack or shipping issue will impact product production and delivery to needed destinations. And fulfillment offers its own set of growing pains, as consumers increasingly expect free and fast shipping for virtually every order. Unfortunately, last-mile delivery represents 41% of the total supply chain cost for retailers[1] and 5% to 10% of all e-commerce deliveries fail, according to Accenture,[2] creating an additional cost for retailers to absorb. Add in-store loss due to stock-out, shrinkage and return fraud, and the combination of all these pressures means that retail must shift away from the status quo.

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1 "The Last Mile Delivery Challenge," Capgemini Research Institute, 2019

2 "The Sustainable Last Mile," Accenture, 2021

AI: Creating a Crystal Ball for Retailers

To stay ahead of expanding consumer requirements and supply chain challenges, retailers need the agility to:

- Accurately and predictably forecast preferences and demand to respond to market fluctuations in real time, ensuring the right merchandise will be available when and where it is needed. The value of historical sales data decreased during the pandemic as consumers overpurchased paper and dry goods early on and then later drove up demand for items such as hair care products and computers for virtual schooling for their children. Retailers already leveraging AI for their forecasting were able to quicky and accurately understand new demand and respond, expanding their market share.

- Reduce in-store shrinkage and stock-out conditions in real time, while improving inventory planning, merchandising and store layout—using computer vision based analytics for traffic heat mapping and dwell time, demographics, sentiment and more. AI can also power connected stores to provide consumers with autonomous checkout, convenient "nano-stores" and smart cabinets.

- Enable brick-and-mortar retailers to rapidly spin up click-and-collect capabilities or curbside pick up, to help them better compete with e-retailers and serve customers who observe social distancing or prefer contactless transactions.

- Add intelligence to warehouses and distribution centers to leverage hive-based storage, autonomous machines and robots, as well as package lifecycle tracking and smart conveyors that change speed dynamically, to mitigate congestion/starvation and increase order throughput.

- Drive up last-mile efficiency by improving route optimization based on real-time traffic patterns and road conditions.

Artificial intelligence (AI) solutions are now one of retailers' most strategic investments because they provide the capability to solve for these critical needs and more across the supply chain.

Retailers that do not or cannot adopt AI may rapidly lose their competitive edge to those organizations that have become AI-savvy. AI is a force multiplier, helping retailers adapt to opportunities and challenges with greater agility by enabling real-time, automated, event-driven and rules-based actions.

Consumers expect the user experience and omnichannel shopping environment to evolve along with the technology—and those who are not fully satisfied with their interactions with a retailer will simply vote with their pocketbooks.

Partnering for Retail AI Success: Microsoft and NVIDIA

Fortunately, retail organizations can get started with confidence. NVIDIA and Microsoft Azure have teamed up to craft a powerful, retail-focused AI partnership that provides a suite of tested and scalable solutions for savvy retailers.

The collaboration leverages the deep AI experience of the NVIDIA team, enhanced by Microsoft's deep retail market knowledge—delivered with a broad range of independent software vendors (ISVs) across the globe. Powered by the NVIDIA AI retail platform and processor technology, the solution suite is a single, integrated environment that optimizes performance and accuracy for AI functionality on Microsoft Azure Cloud, Azure Stack Edge and Microsoft Connected Stores using NVIDIA GPUs.

The partnership is further enhanced with industry-spanning retail expertise, including more than 150 AI-optimized retail, supply chain and fulfillment applications that deliver AI for retail everywhere, including at the edge (in the stores), at the core (corporate data centers) and in the cloud (on Microsoft Azure).

Retailers are turning to the NVIDIA-Azure solution for many reasons. What makes it truly unique is:

- The deep retail and AI domain experience of NVIDIA, Microsoft and the ISV ecosystem.
- An integrated design based on the most powerful AI offering available both on premises and in the cloud.
- Availability of customized AI-enabled solutions through joint AI technical collaboration.
- Delivery on an integrated platform for both training and deployment of AI applications from data center to cloud or edge, simplifying ongoing operations.

The results are powerful: Retail organizations that have embraced the NVIDIA-Azure solution have seen up to a 3x increase in profits thanks to the adoption of AI, according to Microsoft.

Next Steps

Explore new areas of opportunity in retail.

Learn more about NVIDIA's AI solutions for retail here.