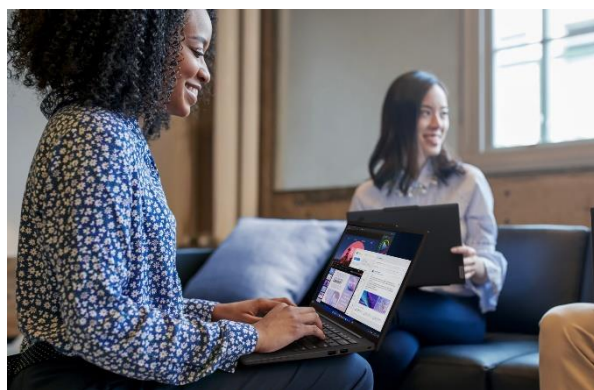# AI PCs in Retail

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Executive Summary

The retail industry is transforming as e-commerce and omnichannel shopping experiences become more popular and consumers demand increasingly personalized interactions. The limits of traditional PCs have left back-office teams struggling to keep up with trends, due to limits in how these systems perform when tasked with managing vast amounts of data, ensuring secure operations, or providing real-time insights into shifting consumer behaviors.

AI PCs overcome these limitations by offering greater computer power and AI capabilities to optimize retail operations. This blog explores the AI PC value proposition in the retail sector, including their potential benefits for inventory management, customer service, and evaluating pricing strategies. These strengths will be particularly potent when integrated with other components of the technology stack, including wider deployment of IoT cameras and smart shelves as well as relevant ISV software packages. AI PCs, and their potential to revolutionize the retail landscape, represent an inflection point for companies aiming to stay competitive and resilient in this fast-changing sector.

Navigating Emerging Trends and Challenges in Retail

E-commerce growth, omnichannel shopping experience integration, and the increasing importance of personalized customer interactions[1] are redefining the front-end customer experience. However, these shifts also bring operational challenges that require attention to back-end processes, such as inventory management and supply chain optimization.

Challenges of Traditional PCs

While many challenges arise from additional operational and infrastructural complexities, reliance on traditional PCs contributes to the issues mentioned above. The limited processing power and inadequate capabilities of traditional PCs can amplify inefficiencies and prevent businesses from achieving the performance and responsiveness modern retail environments require. By understanding these limitations, retailers can better address the underlying issues and transition toward more capable solutions.

Leveraging AI PCs to Transform Retail Operations

When deployed as part of a wider infrastructure strategy that includes robust backend systems and edge or server solutions, AI PCs powered by AMD Ryzen™ AI PRO 300 Series processors can help to address the limitations of traditional PCs. These devices deliver advanced computational capabilities, specialized AI processing, and innovative
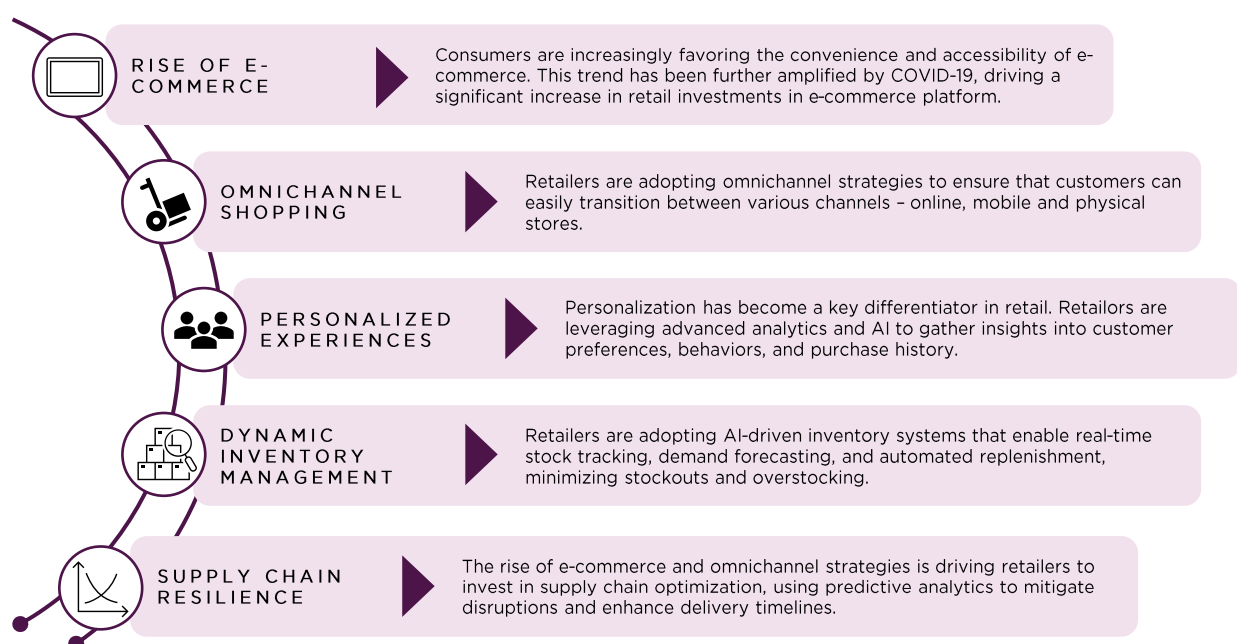

RISE OF E-COMMERCE	Consumers are increasingly favoring the convenience and accessibility of e-commerce. This trend has been further amplified by COVID-19, driving a significant increase in retail investments in e-commerce platform.
OMNICHANNEL SHOPPING	Retailers are adopting omnichannel strategies to ensure that customers can easily transition between various channels – online, mobile and physical stores.
PERSONALIZED EXPERIENCES	Personalization has become a key differentiator in retail. Retailors are leveraging advanced analytics and AI to gather insights into customer preferences, behaviors, and purchase history.
DYNAMIC INVENTORY MANAGEMENT	Retailers are adopting AI-driven inventory systems that enable real-time stock tracking, demand forecasting, and automated replenishment, minimizing stockouts and overstocking.
SUPPLY CHAIN RESILIENCE	The rise of e-commerce and omnichannel strategies is driving retailers to invest in supply chain optimization, using predictive analytics to mitigate disruptions and enhance delivery timelines.

Figure 1 – Retail Industry Trends

[1] Global Retail Outlook

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Traditional PC Limitations	Key Challenges	Impact on Retail Operations
Slow Processing Speed	• Traditional PCs struggle with handling large datasets, leading to inefficiencies in data processing and storage. • The volume of data generated by retail operations continues to rapidly grow, further exacerbating these inefficiencies.	• Slow processing speeds can delay critical decision-making processes and operational workflows such as inventory management. • This can lead to missed sales opportunities and customer dissatisfaction due to stockouts.
Lack of Real-Time Analytics	• Traditional PCs are incapable of supporting real-time analytics.	• Lack of real-time analytics impedes retailers' ability to quickly respond to market trends and offer high-quality customer service.
Increased Security Vulnerabilities	• Traditional PCs security solutions fall short against threats that target AI applications and are highly susceptible to modern cyber threats.	• Security vulnerabilities increase the risk of data breaches, which can have severe consequences for brand reputation and customer trust.

Figure 2 – Challenges in Traditional PCs and its impact on Retail organizations

features designed to complement modern retail environments, enabling organizations to tackle operational inefficiencies with greater precision and speed.

AI PCs outfitted with Ryzen™ AI PRO 300 Series processors provide the computational power required to handle the intensive workloads associated with retail. The 300 Series is engineered for higher instructions per cycle (IPC), power efficiency, and overall performance, courtesy of its "Zen 5" architecture. This allows retailers to analyze large datasets and execute sophisticated AI applications locally and in real-time. From managing dynamic inventory levels to forecasting demand and optimizing pricing strategies, AI PCs ensure that retailers can make data-driven decisions with precision and speed.

While AI PCs can process and integrate data locally, achieving a unified operational view often requires support from edge or server infrastructure in order to enable data integration across IoT-enabled devices, point-of-sale systems, and customer loyalty programs. Such integration allows retailers to analyze shopping patterns, predict trends, and adjust stocking strategies to ensure the right products are available at the right time.

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What are AI PCs?	*Unlike traditional systems, where AI processing is primarily performed on cloud servers that require constant connectivity and potentially impose high latencies, AI PCs incorporate specialized neural processors (i.e., NPUs) to perform these operations locally on the device. This approach reduces reliance on the cloud, enhances real-time performance, and improves data security by minimizing the transfer of sensitive information.[2]*
Advantages of AI PCs	*AI PCs provide benefits across diverse applications, enabling organizations to unlock their full potential:* • ***Personalized****: AI PCs harness AI capabilities to streamline workflows, optimize performance, and enhance user experience.* • ***Productive****: They evolve job responsibilities via AI-assisted content creation, predictive insights, and intelligent decision-making.* • ***Protected****: AI PCs bolster digital defenses with proactive security measures, fraud detection, and cyber-resilience.*

Figure 3 – Defining AI PCs and their associated advantages

Data Security and AMD:

In today's retail landscape, data security is paramount. Recent incidents like the MOVEit cyberattack in 2023, which exposed sensitive customer and employee data, highlight the need for robust protection.[3] AI PCs address this need by performing computations on-device, reducing reliance on external cloud infrastructure and enhancing security. With AMD PRO Security, Ryzen PRO PCs offer additional safeguards tailored to enterprise needs. Features such as AMD Memory Guard provide full-memory encryption to protect sensitive data, even in the event of physical theft. Secure Boot processes ensure only trusted software runs on devices, while real-time threat detection and automated responses proactively mitigate unauthorized access attempts. These advanced security capabilities safeguard sensitive data, protect brand reputation, and maintain customer trust in an increasingly complex digital landscape.

Tangible Benefits

Retailers can enable the efficient execution of AI applications that drive sales forecasting, inventory management, customer service, and marketing by integrating AI PCs as one component of their broader AI technology stack. While AI PCs themselves are not standalone solutions, they provide the computational power required to run sophisticated AI software and models. This includes processing large datasets locally, supporting real-time analytics, and enhancing the overall performance of AI-driven tasks. When combined with well-designed backend systems and AI software, AI PCs play a pivotal role in streamlining workflows and delivering actionable insights that enhance operational efficiency and security.

[2] How Lenovo and AMD define the AI PC | Digital Trends
[3] Cyber Magazine Article - MOVEit Attack

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- **Improved sales forecasting**: 67% of sales operations leaders reporting that creating accurate forecasts is harder today than three years ago.[4] AI PCs can support this process by leveraging their computational power to analyze historical sales data and market trends in real time. When paired with sophisticated AI software, AI PCs enable retailers to generate precise forecasts, manage inventory efficiently, reduce stockouts, and streamline supply chain operations, helping them stay ahead of demand fluctuations.

- **Increased cost efficiencies**: AI PCs integrate seamlessly with retail workflows, automating tasks such as inventory tracking and customer support to reduce manual effort and lower operational costs. Their advanced processing power also improves data utilization, helping retailers identify inefficiencies and optimize resource allocation to enhance profitability.

- **Enhanced Customer Experiences**: AI PCs can analyze customer preferences and behaviors in real time, thanks to their ability to handle large datasets. Such capabilities boost customer satisfaction and loyalty. They can also expedite the creation of targeted campaigns by enabling marketing professionals to work more efficiently and at scale.

Solutions enhanced by AI PCs in Retail

When coupled with edge computing, IoT devices, and backend systems, AI PCs enable innovative applications and use cases, driving efficiency and data-driven decision-making across retail operations.

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[4] Gartner, Use AI to Enhance Sales Forecast Accuracy and Actionability, 25 September 2024

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| Automated checkout systems | Personalized shopping recos. | Dynamic pricing optimization | Real-time inventory mgmt. | Content Creation & Marketing Analytics |

Figure 4 – AI PC-enhanced use cases in Retail

- **Automated Checkout Systems**
  AI PCs can enhance the efficiency of automated checkout systems by running AI algorithms locally for real-time transaction processing and anomaly detection. Integrated with IoT-enabled devices such as smart scanners and point-of-sale systems, AI PCs reduce reliance on cloud connectivity, enabling simultaneous transaction processing with minimal latency. This reduces wait times and increases customer throughput. AI PCs can also perform real-time anomaly checks, identifying mismatches in scanned items or payments for immediate resolution.

  Example: A busy grocery store uses AI PC-powered checkout software to process multiple transactions concurrently, ensuring peak-hour traffic flows smoothly while resolving payment discrepancies locally and in real time.

- **Personalized Shopping Recommendations**
  76% of customers say that personalization is essential when considering whether to purchase from a brand.[5] AI PCs can execute machine learning models locally to analyze customer purchase histories, preferences, and real-time browsing behavior, ensuring instant, tailored recommendations. By processing this data on-device, AI PCs minimize latency, improve privacy, and reduce dependency on external cloud servers. Integration with recommendation engines enables retailers to boost customer satisfaction and drive sales.

  Example: An AI PC-powered kiosk in a fashion store analyzes customer preferences and purchase patterns locally. It suggests complementary accessories in real-time, enhancing upselling opportunities while maintaining data security.

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[5] Impact Of AI On Customer Journey Personalization

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- **Real-Time Inventory Management**
  AI PCs can enable advanced inventory management by running predictive analytics and machine learning models locally to provide real-time visibility into stock levels. Integrated with IoT devices like smart shelves, AI PCs can analyze inventory data in real time, forecast demand, and automate restocking orders.

  Example: A convenience store equipped with an AI PC-integrated inventory system monitors beverage supplies continuously and triggers automated restocking orders when inventory levels fall below a set threshold.

- **Dynamic Pricing Optimization**
  AI PCs can execute dynamic pricing algorithms by analyzing local datasets, including market trends, competitor pricing, and real-time customer behavior. This localized processing allows real-time price adjustments, ensuring competitive pricing and maximizing profitability. By running pricing models on-device, AI PCs reduce data transmission overhead and improve decision-making speeds.

  Example: A retailer using AI PC-powered pricing software dynamically adjusts prices for overstocked items during seasonal sales, clearing inventory efficiently while processing real-time pricing data locally for faster responses.

- **Content Creation and Marketing Analytics**
  AI PCs can significantly enhance the efficiency of retail marketers by providing NPU/GPU capabilities to support local content creation, without relying on network and cloud connectivity. By integrating AI PCs with advanced personalization algorithms, retailers can gain real-time customer insights to adapt their content and marketing strategies to individual customer preferences, fostering stronger relationships and increasing conversion rates.

  Example: A retail marketer uses an AI PC to analyze customer data before generating personalized email campaigns and tailored social media posts. This ensures their strategies are continuously aligned with the latest consumer insights.

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Conclusion

AI PCs are set to redefine the retail landscape by overcoming the limitations of traditional systems and delivering advanced computational power, mobility, and efficiency. By integrating AI PCs into their technology stack, retailers can unlock new opportunities to enhance customer experiences, streamline operations, and drive measurable ROI. These systems are not just tools for today's challenges but key enablers for future innovation, empowering businesses to adapt to evolving market demands with agility and resilience.

As AI technology continues to advance, the role of AI PCs in retail will only grow, providing a foundation for personalized experiences, real-time decision-making, and operational excellence. For retailers aiming to remain competitive and future-ready, investing in AI PCs is not merely a technological upgrade—it's a strategic imperative.

Next-gen AI performance has arrived. The benefits of AI are now available for your organization, without compromise with the Lenovo ThinkPad T14s Gen 6 powered by AMD Ryzen AI 7 PRO 360 processors.

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