



Retail revolution:
powered by AI and
spatial computing

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Introduction

Revolutionizing retail with AI and AR

Imagine a retail space where your preferences are instantly recognized, digital signage is displaying exactly what you're looking for, and checkout is handled automatically. AR overlays on your phone highlight recommended items on the shelves, and AI-driven systems adjust inventory in real-time.

This story reflects the not-so-distant future. The retail industry is undergoing a significant transformation, driven by cutting-edge technologies and changing consumer expectations. To meet these new demands, retailers are integrating innovations like artificial intelligence (AI) and augmented reality (AR) to enhance customer loyalty, optimize advertising, and create immersive shopping experiences.

Curious about how these technologies are reshaping our shopping experiences? Let's explore five key areas where retail is being revolutionized: digital experiences and loyalty, immersive experiences, retail media networks, logistics, and cashiering.

AI will cure all your logisitic headaches.



But can it really?



Digital experiences and loyalty

In today's economic uncertainty, retaining existing customers has become more critical and challenging than ever. Additionally, a recent survey found that brand loyalty dropped from 79% to 68% in 2023.¹

This decline in consumer loyalty along with the increasing trend of purchasing groceries online² and the rising demand for quick commerce promising delivery in 30 minutes or less is prompting retailers to rethink their digital presence. Therefore, updating loyalty programs is becoming increasingly essential for customer retention.

AI is directly influencing the change in loyalty programs and digital touchpoints. As retail shoppers become more accustomed to interacting with AI, their behavior is evolving. AI-driven chat platforms are increasing the expectation for brands to communicate in a human-like manner. Additionally, many shoppers are starting to rely on AI search assistants to find products or services based on their needs rather than specific brand names or ingredients.

For example, instead of typing in brand names or specific ingredients like melatonin when looking for a sleep aid, today's shoppers are more likely to search for 'a product that will help me sleep better.' This shift reflects a growing comfort with AI-driven searches that prioritize user needs and preferences.

AI will double your revenues.



But can it really?

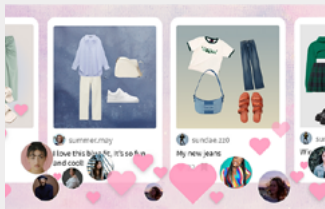


Another innovative application of AI is visual search, which enables customers to find exact or similar products by simply uploading images of the items. Visual search offers more than just basic product discovery. Retailers can integrate AI into loyalty platforms, allowing users to track the cost-per-wear or usage of purchased items. Users could also be encouraged to upload images of previously purchased items that AI will automatically apply tags and attributes to – enriching therefore data available to retailers while offering a new user experience.

AI is also revolutionizing retail content creation by facilitating the production of dynamic product descriptions, engaging blog posts, and other brand-compliant content that aligns with the tone-of-voice, inclusivity and other guidelines. The synergy of data and AI helps retailers to offer targeted and hyper-personalized content that captivates customers.



Starbucks Rewards³ and Sephora Beauty Insider⁴ loyalty programs analyse customer purchase history and preferences using AI, to deliver personalized offers and recommendations.



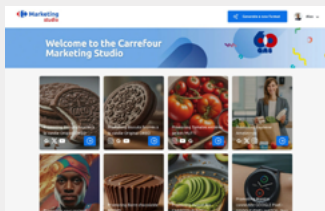
AI-powered wardrobe management apps like **Acloset⁵** allow users to upload clothing that gets automatically tagged based on attributes like category and color. The users can check the item's cost-per-wear, track outfits worn daily and get AI outfit suggestions based on wear patterns observed.



StyleSnap⁶ is an AI-powered feature built into the **Amazon** app. It helps users find looks they love quickly and easily and allows them to discover items that are similar to what the AI identified on the image the user has uploaded.



Emerging AI models like Alibaba's **Outfit Anyone⁷** or Google's **TryOnDiffusion⁸** will soon revolutionise virtual-try on by allowing brands to give users an option to try on products on their own images.



Carrefour's Marketing Studio is an AI-powered tool designed to streamline the process of creating dynamic campaigns across various social networks such as X, Facebook, Instagram, Google Ads, and more⁹.

Immersive experiences

Gaming, virtual reality (VR) and augmented reality (AR) enable retailers to create engaging, interactive environments that captivate customers. According to a new study, 93% of surveyed companies plan to increase their investment in immersive experiences over the next three years.¹⁰

AR will increasingly serve as a visual aid, helping shoppers navigate the store and engaging them through immersive multi-dimensional campaigns.

When combined with AI-powered analytics and segmentation, future AR apps can highlight areas of interest tailored to each individual customer. For instance, a vegan customer might want to quickly identify vegan-friendly products in a supermarket, with vegan options on shelves highlighted with a colorful AR overlay.

Games represent a new touchpoint for brands looking to connect with a young, tech-savvy audience. Retailers like Walmart and IKEA have recognized the opportunity to use platforms like Roblox to create engaging experiences that transcend traditional retail boundaries. These open-world, customizable gaming platforms facilitate community building, simulate real-world activities, and foster engagement through interactive gameplay. They foster a two-way brand-user relationship where the user is not just a consumer of content, but also a creator. Many branded gaming spaces now allow the community to produce user-generated content (UGC) and even sell that content within the game.



Shoppers passing by **Coach's** store on Prince Street in SoHo, New York, were captivated by an interactive window display. Coach introduced the first storefront AR try-on digital mirror that allowed pedestrians to see themselves wearing the brand's popular Tabby bag in various colors and styles¹¹.



Ikea is now hiring for unique positions at their virtual store within Roblox. This fully remote opportunity offers a competitive hourly rate of £13.15 / €14.80 and involves assisting customers, showcasing skills, and earning promotions, similar to real-world employment experiences¹².



The "**Walmart Discovered**" Roblox experience has surpassed 20 million visits and holds a 96% approval rating, the highest for any brand on the platform. This virtual space allows users to interact with items, play games, customize spaces, and create content.



Car dealerships are known to feature VR product experiences, like the **Porsche Taycan VR Experience**. This experience enables customers to digitally explore the Porsche Taycan, giving a detailed view of the vehicle, including its internal components, through virtual reality goggles¹⁴.

Retail media networks

Diversifying revenue streams is becoming a priority, rushing retailers to build their own retail media networks (RMNs). RMNs allow retailers to sell ad space on their digital platforms to third-party brands. By integrating AI into RMN systems, retailers can target customers more effectively, boosting advertising efficiency and ROI.

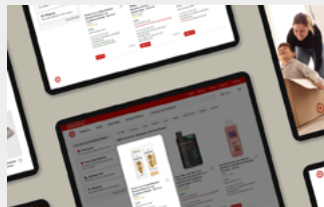
One way retailers use RNM is by combining loyalty program's customer data with secondary data like weather conditions to deliver specific product suggestions through digital signage. And AI can make digital signage displays even smarter.

Traditionally, retailers could only track the volume of people at the entrance, exit, or specific parts of the store. Others collect data from customers who have signed up for loyalty programs and provided their mobile numbers. With AI-powered cameras, retailers can collect demographic details such as age and gender and track when customers enter or exit—without requiring them to be part of a loyalty program or needing to store any recordings or images of their faces.

When retailers combine newly obtained real-time demographic and behavioral data with secondary data, digital signage can adjust product suggestions in real-time. These adjustments are based on the customer profile that the AI system identifies as having entered the store at that precise moment



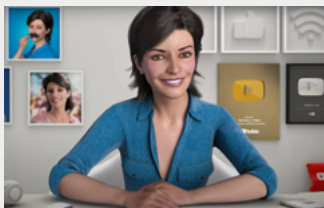
Walmart Connect¹⁵ uses AI to analyze shopper data and optimize ad placements, ensuring that ads are relevant and effective. This omnichannel approach, including digital signage displays in-store and ads on Walmart Radio, allows Walmart to deliver ads at multiple touchpoints throughout the shopper's journey.



Target launched the **Roundel Media Studio**¹⁶, a self-service tool that allows advertisers to buy search ads directly, further streamlining the ad buying process and enhancing targeting precision.



Fujitsu has recently revealed a new AI module for retailers that generates AI avatars and customized promotional content on digital signage based on in-store behavior data of consumers¹⁷.



Magalu, often referred to as the "Amazon of Brazil," has been employing a virtual influencer "Lu" since 2003¹⁸. This virtual influencer represents the brand and has a significant social media following and presence.

Logistics and tracking

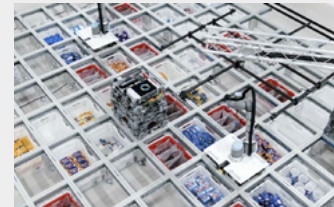
AI-driven solutions optimize delivery routes, predict inventory requirements, and automate pricing adjustments, making retail operations more efficient and responsive. In the food sector, AI can be used reduce waste by verifying the expiry dates of products and recommending dynamic pricing adjustments to encourage sales of near-expiry items.



Danish company **Too Good To Go**¹⁹ uses AI algorithms to generate near-expiry product lists, saving employees time and reducing human errors.



Leading fast-fashion companies, such as **H&M** and **Zara**²⁰, are increasingly leveraging artificial intelligence to stay ahead of fashion trends. AI helps these brands predict future trends, track inventory levels, analyze historical data, and anticipate customer demand.



Ocado, a British online supermarket is using AI to revolutionize its operations. Their system, "Ocado Smart Platform"²¹, integrates AI to optimize warehouse operations, streamline delivery routes, and manage inventory levels, ensuring faster and more accurate service for customers.

Cashiering

Advancements in humanoid robots by companies like Xpeng²², Tesla²³, Boston Dynamics²⁴, and Figure²⁵ suggest a future where robots could replace humans. But, this scenario is unlikely to happen anytime soon, mainly due to high maintenance and other costs and the uncanny valley effect associated with androids.

Meanwhile, self-checkout systems are set to succeed once current issues are resolved. Apart from concerns about job displacement, these systems often fail to meet customer expectations. A survey showed that 67.3% of users experienced malfunctions at self-service kiosks.²⁶

Short-term resistance is also expected towards AI-powered self-checkout systems due to the perceived gimmicky nature of some cashier-free systems. A recent example includes the revelation that Amazon's "Just Walk Out" technology is staffed by humans rather than being fully AI-powered as initially suggested.²⁷

Retails will instead increasingly adopt RFID technology, which has proven reliable over decades of existence. Originally used for inventory tracking, RFID is now applied to a wider range of products, enhancing data collection and serving as a key anti-theft tool.

The days of bulky RFID tags limited to clothing are over. Now, sticker-like tags can be placed on any product, allowing customers to add items to their carts and leave without manual scanning. RFID technology will not only speed up the shopping process but also improve operational efficiency by providing insights into stock levels, consumer behavior, and product performance.

As these technologies progress, the role of human employees will shift towards roles that require complex decision-making, tailored customer service, and specialized knowledge. For instance, grocery stores might hire dietitians to offer tailored dietary advice. While some suggest that robots could take on these tasks, there's expected pushback against overly robotic stores and impersonal advice from machines that lack a human touch.



Veeve is a smart cart checkout system equipped with cameras and vision AI to detect items placed in the cart. This device, automatically scans the products that are placed in the shopping cart, and processes the payments. Data collected by Veeve indicates that shoppers typically spend 10% to 15% more when using this technology²⁸.



Instead of Just Walk Out, **Amazon** will continue to work on Veeve-like tech called **Dash Carts**: a scanner and screen that's embedded on the shopping cart, allowing users to checkout as they shop²⁹.



Residents of a small village in rural Finland can now use an unstaffed, automated convenience store. The store features **RAIN RFID** tags on each item, allowing shoppers to quickly self-checkout with a POS system that automatically scans all items in their basket³⁰.

Conclusion

Key considerations before the integrations

The future of retail is undeniably intertwined with advancements in AI, spatial computing, and robotics. Retailers that embrace these technologies will be better positioned to enhance customer loyalty, diversify revenue streams, and create immersive shopping experiences. It is crucial to consider data collection, security and legal considerations, and strategic analysis.

Data collection is essential for leveraging these technologies to their fullest potential. It enables AI to segment customers into profiles and much more. However, it is important to note that while many companies are AI-ready, most are not data-ready. This readiness gap can hinder the effective use of AI and other advanced technologies

Security and legal considerations must balance data collection with stringent measures and compliance rules. Retailers need to ensure that collected data is securely stored and protected. Additionally, they must navigate the complexities of data privacy laws and regulations to ensure all practices are compliant.

Strategic analysis is crucial for the effective implementation of any solution. Just because a technology can be integrated doesn't mean it should be. Retailers need to develop strategies that align with their overall goals and capabilities, ensuring that the adoption of these tools enhances customer experience and operational efficiency without unnecessary complications or ethical concerns.

The integration of AI in digital loyalty programs, AR in creating engaging and personalized shopping environments, and robotics in optimizing logistics and cashiering systems represents a significant shift towards a more efficient retail landscape. While the complete phasing out of cashiers due to robotics is unlikely to happen soon, the rise of self-checkout systems will shift the demand towards hiring advisory roles, such as dietitians, to help customers make informed purchasing decisions.

As we move towards a more technologically integrated retail environment, the ultimate goal remains the same: providing exceptional value and convenience to customers. Adopting these technologies is not optional for those who want to keep up with the competition and the ever-evolving retail industry.

Transform your retail strategy

Join forces with Emakina, an EPAM company, and harness the power of cutting-edge technologies to elevate your retail strategy.

Our holistic approach, blending engineering, consulting, and marketing expertise, ensures your business meets the evolving demands of consumers, fostering loyalty and driving growth. Transform your retail experience with us, and stay ahead of the curve.

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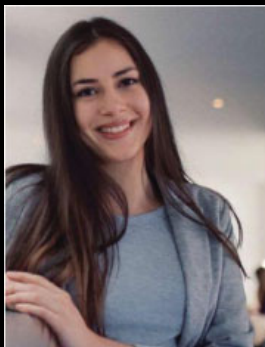
About Emakina, an EPAM company

Emakina is a digital agency with global reach. It is part of Emakina Group, an EPAM Systems Inc. (NYSE: EPAM) company. Its technology and marketing experts work with customers to develop high performance marketing and creative solutions for business challenges, from cutting-edge applications, websites, and eCommerce projects to impactful content and campaigns. As the ambassadors for users, Emakina places the user's requirements and expectations at the heart of every digital experience. This approach offers the agency's customers and their brands a privileged relationship with consumers of the digital age.

Learn more at www.emakina.com

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Team up with our experts to transform your retail strategy and stay ahead with cutting-edge technology.



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