TATA COMMUNICATIONS

TATA

SHAPING RETAIL OF THE FUTURE

Transforming customer experiences at the edge

Abstract

In the rapidly evolving retail industry landscape, the need for swift response times and efficient outcomes has transitioned from a preference to an essential imperative. The migration of workloads and applications to cloud environments underscores the demand for agility and adaptability. As the journey into the future gain's momentum, bolstered by AI/ML, IoT, automation, and robotics, the role of edge computing has become paramount.

The use of edge computing for immersive and personalised marketing campaigns to enhance customer experiences is already a reality. Edge computing is not only shaping an environment that is conducive and scalable but is also robustly secure. That said, retail enterprises are primed to leverage the as- sistance of comprehensive, fully automated edge computing platforms to drive industry-leading use cases at scale, delivering valuable, never-seen-before business outcomes.

vayu | Edge

Today's retail paradigm

Retail has seen a major shift in recent years. Mixing online and offline shopping through omnichannel strategies is now the norm. The rise of e-commerce alone poses a significant challenge for many retailers. However, it is the emergence of new customer journeys, such as buying online and picking up at the store, local- ised delivery, and shipping from store, that have introduced added complexity to retail operations.

Moreover, retailers are now grappling with the proliferation of lot devices, including mobile devices, cameras, beacons, kiosks, digital signs, and electronic shelf labels, all of which generate substantial amounts of data at the store level. This surge in data generation has led to strained network bandwidth and connectivity, requiring careful considerations. Also, sustainability has gained importance, prompting brands to adopt eco-friendly practices.

In such a scenario, embracing technology, enhancing customer experiences, and staying agile will be crucial for retail enterprises. The integration of cutting-edge technologies into retail operations, especially at the edge, represents a transformative shift in the industry. Edge computing, a paradigm that processes data closer to its source, has introduced remarkable capabilities to retailers. It facilitates real-time data analysis, significantly improving inventory management, supply chain optimisation, and the delivery of personalised customer experiences.

Additionally, AI-driven analytics at the edge enables predictive maintenance, ensuring the seamless operation of critical equipment. As the retail landscape continues to evolve, the adoption of edge technologies is a crucial strategy for maintaining competitiveness, operational efficiency, and customer-centricity.

“Store in a box” has emerged as a resounding trend.

Today, retailers are striving to craft distinctive and memorable shopping journeys that seamlessly integrate elements from both the digital and physical realms. On the physical front, traditional brick-and-mortar stores are undergoing a transformation into experiential hubs rather than merely functioning as conventional retail outlets. In the dynamic and ever-changing realm of retail, "store in a box" has emerged as a resounding trend that is capturing the attention of the market. This innovative concept offers a comprehensive solution that simplifies the intricacies of establishing and managing a retail store, whether it's a physical brick-and-mortar establishment or a thriving e-commerce venture. Store-in-a-box solutions present retailers with a streamlined and cost-effective pathway to enter the market swiftly. With pre-packaged components encompassing everything from point-of-sale (POS) systems to store fixtures, lighting, and even branding elements, retailers can expedite their processes with limited intervention.

Moreover, the inherent scalability and customisation options in store-in-a-box solutions render them adaptable to a broad spectrum of retail environments, fostering a consistent and unified brand identity across multiple locations. As the retail industry continually adapts to shifting consumer preferences and technological advancements, store in a box will become an indispensable tool for forward-thinking retailers determined to thrive in this new era of commerce.

This trend also extends to the provisioning of structured cabling and core networking, including LAN and WiFi, to facilitate seamless connectivity for technology devices within the store. The same holds true for CCTV and surveillance systems, which enhance store security and safety measures. The utilisation of SD-WAN solutions also results in high-performance interconnection between sites via the public internet, bolstered by enterprise-grade security. The deployment and installation of local computing infrastructure further support the efficient processing of POS and other computing devices, enabling the store to function autonomously when necessary.

The provisioning and deployment of mobile devices, tablets, traditional laptops/ desktops, and printer technology empower in-store and mobile users to fulfil their roles, engage with customers, and deliver optimal customer service. In sum, the store-in-a-box trend encompasses an array of solutions that address the multifaceted needs of the modern retail landscape, promising enhanced efficiency, flexibility. and customer satisfaction.

Data at the edge

Studies show that 175 zettabytes of data will be generated by 2025, up from only 33 zettabytes in 2018. IoT has had a significant role to play in this growth as the number of connected devices has also increased exponentially in the last few years. As of 2023, there are about 15.14 billion IoT devices and this number will almost double - 29.42 billion by 2030. In this scenario, edge computing will be crucial for processing the data effectively and delivering real-time insights.

Most industries are anticipated to embrace edge computing to varying extents. However, the vanguard of early adopters includes sectors such as retail and consumer goods, manufacturing, energy and utilities, telecommunications, logistics, and healthcare. The revolution in edge computing draws its impetus from a surge in investments; improved network capabilities based on 5G and Wi-Fi 6 connectivity; continued facilitation of AI/ML, automation and robotics, smart sensors and IoT applications, and AR/VR applications; and the proliferation of the containerisation technology.

The retail industry has seen early adoption and implementation of edge computing. By recognising the need for reducing data latency and processing the data at the edge, retail enterprises are reshaping their operations strategically. Not so long ago, customers were used to shopping at stores in conventional ways reaching the store, finding the right product section, populating the cart, and concluding the purchase at the payment counter. However, with edge computing lot, and AI-enabled automation, shoppers now enjoy immersive experiences from start to end. They not only get a larger catalogue and expedite the shopping process but also enjoy greater value at every step of the way.

Customers are central to retail operations

Edge computing empowers retailers to integrate advanced immersive encounters within their stores as well as their virtual shops. It is crucial for an omnichannel experience. This holds significant potential in sectors such as beauty and apparel, clothing, etc. where virtual try-ons can profoundly reshape the customer journey. Edge computing's swiftness empowers real-time delivery of customer insights to sales associates, equipping them with the information to enhance customer interactions and uncover upselling prospects.

Stated below are the key outcomes that are facilitated by edge computing:

- **Enhanced customer experience:** Retail and consumer goods industries are now prioritising personalised, seamless customer experi- ences. Edge computing enables real-time data analysis, delivering tailored recommendations, targeted ads, efficient inventory management, and faster checkouts. It also facilitates product customisation, meeting individual customer demands. Edge computing empowers retailers to meet evolving consumer expectations.

- **Low latency:** In the realm of digital commerce, rapid response times are crucial for maintaining customer engagement and reducing cart abandonment rates. Edge computing enables faster website loading times, smoother online transactions, and real-time inventory updates, contributing to improved customer conversion rates.

- **In-store analytics:** Edge computing facilitates the collection and analysis of data from in-store sensors, cameras, and IoT devices. This data can be used to optimise store layouts, monitor footfall, and enhance product placement strategies, ultimately improving store operations and customer experience.

- **Inventory management and supply chain optimisation:** Retail and consumer goods enterprises deal with complex supply chains and inventory management. Edge computing helps streamline these processes by providing real-time insights into inventory levels, demand patterns, and potential supply chain disruptions, leading to more efficient operations and reduced stockouts.

- **Distributed store networks:** Many retail and consumer goods chains have numerous store locations. Edge computing provides a scalable solution for managing and analysing data from multiple locations, enabling centralised management and data-driven decision-making.

- **Loss prevention and security:** Edge computing facilitates real-time monitoring of security cameras and sensors, enabling immediate detection and response to suspicious activities. This enhances loss prevention efforts and ensures the safety of both customers and employees.

Top five retail use cases

Edge computing has revolutionised the retail industry by bringing computation and data processing closer to the source, thereby enhancing real-time decision-making and customer experiences. In retail, edge computing enables a myriad of transformative use cases. These include inventory management through IoT sensors for precise stock tracking, cashier-less stores powered by computer vision and AI, personalised in-store shopping experiences with location-based services, and efficient supply chain management. Edge computing also ensures uninterrupted operations, even in areas with unreliable network connectivity. Here are five important use cases in retail:

In-store shopping experience:
Elevate the in-store shopping experience in retail by enabling real-time data analysis, personalised interactions, and immersive technologies. For instance, edge-based smart shelves equipped with the Radio-Frequency Identification (RFID) technology help customers in approaching the right product shelf. Similarly, sensors embedded in the shelf detect which items are running low or have been picked up by the customer. Such edge-facilitated outcomes lead to improved customer engagement, increased sales, and a more efficient and enjoyable shopping journey.

Magic mirrors and virtual try-ons:
Personalisation tools, virtual try-ons and interactive methodologies, enables customers to view themselves in a customised setting. Similarly, edge-based systems can also suggest accessories or related products that pair well with the selected clothing item, further assisting the customer in making informed choices. This allows them to make decisions and conclude the purchase instantly, thereby enhancing the overall experience and brand loyalty.

Robust POS systems and seamless checkouts:
Empower POS management and accelerate checkout experiences in retail by processing data locally, reducing latency, and enabling faster decision-making. For instance, edge-based smart kiosks not only foster self-service and expedite checkouts but also reduce payment errors and duplications. This results in improved operational efficiency, enhanced customer satisfaction, and streamlined retail transactions.

Shrinkage reduction:
Proactively address shrinkage which encompasses inventory and merchandise losses from theft, employee fraud, administrative errors, and damage by processing data in real time, enabling immediate alerts, and providing actionable insights that help prevent losses caused by shrinkage.

Stockout monitoring:
Through real-time and meticulous inventory management and automated tracking and reordering, retailers are aided by edge computing in preventing stockouts. It also triggers immediate alerts, provides valuable insights on inventory status, and forecasts demands. This leads to reduced stockouts, improved operational efficiency, and enhanced customer satisfaction.

Revolutionising customer experiences with Tata Communications Vayu Edge

At Tata Communications, we specialise in helping our retail customers accelerate their digital transformation by leveraging cutting-edge cloud-native technologies. Our focus is on helping retail customers build, secure, and manage enterprise-grade edge applications. We prioritise consistency, performance, reliability, and secu- rity, all of which are essential for retail edge use cases such as virtual try-ons, digital signage, seamless check- outs, stock monitoring and much more. In response to the evolving needs of enterprises, we have developed a comprehensive and fully automated edge platform called Tata Communications Vayu Edge.

For our customers, Tata Communications Vayu Edge presents three distinct deployment options: Prime (a SaaS-based edge platform), Proximate (an edge-in-a-box solution), and Private (enabling the creation of a customised edge cloud with full control). These options offer pricing flexibility, tailored to meet specific business requirements. It is thoughtfully designed for seamless integration with all cloud environments and complemented by a suite of fully managed services, making it a user-friendly and efficient solution. This adaptability is particularly crucial in today's fast-paced retail landscape.

Retailers can harness the power of Tata Communications vayu Edge by availing a vast selection of over 50+ industry-leading edge use cases. The potential of this platform extends beyond its capabilities to its strategic technology partnerships.

With its substantial promise, Tata Communications Vayu Edge has emerged as a pivotal force for retailers embarking on their edge-backed transformation journey. It unlocks boundless opportunities at the edge, facilitating seamless checkout experiences, streamlined retail processes, and efficient operations.

To know more about Tata Communications Vayu Edge and how it can revolutionise your retail operations, talk to us today.

About Tata Communications

Tata Communications is a leading global digital ecosystem enabler that powers today's fast-growing digital economy. The company's customers represent 300 of the Fortune 500 whose digital transformation journeys are enabled by its portfolio of integrated, globally managed service that deliver local customer experiences. Though its network, cloud, mobility, Internet of Things (IoT), collaboration and security services, Tata Communications carries around 30 per cent of the world's internet routes. It connects businesses to 60 percent of the world's cloud giants and four out of four-five mobile subscribers.

Its global reach underpins the company's capabilities. It owns the world's largest wholly-owned subsea fiber backbone and operates a Tier-1 IP network connecting to more than 240 countries and territories. Tata Communications globally delivers a superior, always-on experience. We maintain a Leader position in the Gartner Magic Quadrant. Plus, reassuringly, we are a Cisco' Gold Standard UC Experience' partner globally. We have your business covered.

vayu | Edge

For more information, visit us at www.tatacommunications.com

Contact us