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Retailers are growing their adoption of edge solutions to gain better performance and efficiency of critical applications while still maintaining data security. To stay ahead of the curve, retailers should consider investing in edge solutions.

Achieving the Benefits of Edge in Retail While Keeping Data Safe

October 2021

Questions posed by: Lumen

Answers by: Leslie Hand, Group Vice President, IDC Retail Insights and IDC Financial Insights, and Margot Juros, Research Manager, Retail Technology Strategies

Q. What are the benefits and perceived risks of edge computing in retail?

A. Retailers are growing adoption of edge to achieve some key benefits amid a significant increase in retail data, driven largely by the proliferation of data-rich Internet of Things (IoT) and mobile applications across operations. Nearly 90% of retailers using cloud applications either have already deployed or plan to deploy an edge workload, such as IoT or analytics (IDC's *CloudPath Survey,* May 2021). In addition, 42% of retailers either have or are planning an in-store infrastructure edge implementation (IDC's *Retail Core Processes and Applications Survey,* May 2021*).* The growing adoption of edge highlights the importance of the benefits these solutions can bring, including:

- **Better performance, lower latency, and faster data processing** of real-time retail store, supply chain, and warehouse applications
- **Cost savings** that include lower transmission costs from processing and storing data closer to where it is generated
- **Improved operational efficiency** that enables faster/better access to data and analysis for customer- and associate-facing applications for greater efficiency
- **Redundancy for mission-critical applications** that ensures continued seamless customer experience regardless of circumstances

While edge computing offers an array of benefits to optimize retailer operations, there are some perceived risks as well. One of the most cited areas of concern is the security and privacy of edge data, though careful planning can ensure robust security of data on edge solutions.

Q. How can retailers protect the security of their data and avoid brand-damaging customer data breaches while using edge computing?

A. Most important is to weave integrated security in from the start of edge implementation. When a retailer is selecting an edge vendor, a key best practice is to ask for a demonstration of security capabilities and services to ensure the vendor has the expertise and experience needed by the organization.

The distributed nature of edge computing means that data and applications are spread across a wide range of locations rather than centralized datacenters with a centralized security team. Perimeter defense is no longer enough. By working with an edge provider, a company can extend integrated protection across distributed operations. Best strategies for ensuring data protection and preventing breaches include:

- **Automation and scaling:** Provide built-in security that is automated and can dynamically scale to meet risks
- **Fully encrypted data transmission and storage:** Ensure the safety of the data in transit and in storage
- **Access control**: Employ a zero trust security model in which no user or device is trusted until it is proven that it can be trusted
- **Redundancy:** Include redundancy or failover management to ensure protection remains even in the event of network failures

Q. How can retailers balance ease of orchestration with top-of-the-line security?

A. Employing edge computing solutions is a crucial step in a retailer's journey to seamless omni-channel commerce. Edge works together with cloud computing to optimize digital operations. Incorporating edge computing data and decision-making architecture across the retail ecosystem is part of enabling smooth omni-channel experiences, allowing customers to interact, buy, and fulfill where they want and when they want across store, mobile, and digital channels. Unlocking this potential requires excellent automated orchestration to move workloads seamlessly and securely across operations to ensure optimal speed and efficiency across operations.

Top-notch orchestration is essential as retailers modernize operations by moving more applications toward cloud. Digitally transformed retailers will want to intelligently manage workloads through cloud, edge, and on-premises scenarios depending on the speed, security, and immediacy requirements of the specific application. Good orchestration helps retailers better manage application performance, including security and compliance, intelligently applying the right level of security for the specific data used in an application.

Well-orchestrated edge solutions can play a role in a variety of omni-channel strategies, such as surfacing real-time inventory choices for customers that are aligned across digital and physical carts; triggering omni-channel customer engagement in aisle; enabling secure "buy online, pick up in store" (BOPIS) applications; and providing real-time pricing across channels. In-store productivity can also be improved by enabling real-time data insights, including associate task management/communications, queue management, and merchandising/inventory management.

Q. How does edge computing impact application performance and security in terms of speed and availability?

A. Edge computing can really benefit application performance by increasing the speed of availability and access to data across all channels of a retail operation. Use of edge computing especially improves the performance of applications that require real-time data or that are data intensive, such as personalized engagement, inventory management, workforce optimization, and real-time pricing. Edge computing's low latency can make a difference in helping applications run more smoothly and efficiently. For example, customers may become frustrated or even abandon their shopping cart when faced with slow-moving point-of-sale (POS) transactions, but the speed and efficiency of edge-based POS applications may alleviate that pain point completely.

Built-in security solutions do not detract from the low latency and better performance of retail applications running on the edge. Use of edge computing can actually improve the security of data transmission. Data is not traveling as far for analysis, so there is a smaller "attack surface" of data transmission that could be breached. Additionally, edge solutions with integrated security have the ability to intelligently steer application data with the right level of security applied with no impact on the application performance.

Retailers that have adopted edge computing solutions can use specific metrics to measure the impact of edge in meeting operational performance goals.

Q. What are the in-store areas that retailers should consider for edge computing adoption?

A. Edge solutions can optimize data-intensive applications that customers desire, especially with consumers' greater interest in safety and security coming out of the pandemic. Some popular applications that shoppers want — including contactless payments, product information on their mobile device, and even augmented reality (AR)–enabled "magic mirrors" to try on clothes without physically changing — would benefit by being on the edge.

According to a recent IDC global retailer survey, retailers consider the following applications the most important in driving implementation of in-store edge computing.

- **In-store customer service management,** including remote monitoring and in-store analytics
- **Infrastructure management/back office,** including remote monitoring and secure data storage
- **Loss prevention/fraud management,** including computer vision cameras using edge
- **In-store inventory management,** including remote monitoring and RFID
- **POS/payment/self-checkout,** including computer vision and remote monitoring

Retailers are adopting edge not only for in-store applications. There are critical applications throughout supply chain, operations, and logistics that benefit from edge computing for both omni-channel and ecommerce retailers. Retailers are increasing remote monitoring of inventory, assets, and transportation, which is helping drive edge adoption. Areas outside the store where retailers are increasing edge investment include:

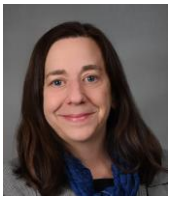
- In-transit inventory management, track and trace, and compliance
- Driver monitoring and compliance
- Asset management (trucks, preventive maintenance)
- Warehouse equipment monitoring
- Loss prevention/shrinkage
- Inventory locating and sensing

To keep ahead of the curve, retailers may want to consider edge investment in these applications to gain the benefits of optimized performance and efficiency leading to better customer experience and smoother, more efficient operations.

About the Analysts

Leslie Hand, *Group Vice President, IDC Retail Insights and IDC Financial Insights*

As Group Vice President, Leslie Hand is responsible for the research direction and teams supporting IDC Retail Insights and IDC Financial Insights. Hand works closely with the teams to help guide technology suppliers and buyers to develop best practices and strategies, aligned with where they are and where they want to go, leveraging IDC quantitative and qualitative data sets. Ms. Hand's specific research focus includes a particular emphasis on the digital transformation of the future "store," which operates in real time, is AI enabled, and connects omni-channel customers to the frictionless, "touch free," and secure experience that they desire.



Margot Juros, *Research Manager, Retail Technology Strategies*

Margot Juros is a Research Manager for IDC Retail Insights responsible for the Retail Technology Strategies research program. Ms. Juros' core research focuses on best practices, trends, market conditions, business concerns, and vendor offerings to provide authoritative advice on investment, life-cycle management, and the use of technologies for modern IT infrastructure. Her research covers key technologies in retail transformation, including IT modernization, cloud/edge/5G, security, payments, mobile platforms, and network management.

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