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Edge Computing: Powering Frictionless Retail

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Navigating this InfoBrief

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Executive Summary

Edge computing will transform how retail manages the exponential explosion of structured and unstructured data from the proliferation of retail Internet of Things (IoT) and mobile device capabilities. Big data is most valuable when extracted and analyzed in a timely manner to identify the next best action to take. A majority of retail workloads and use cases depend on real-time or frequent access to data. Consider for example, personalized customer engagement, efficient omnichannel inventory and order management (pick, pack, and ship from store stock), store traffic insights and queue management, and increasingly automated processes for checkout and fraud/loss prevention.

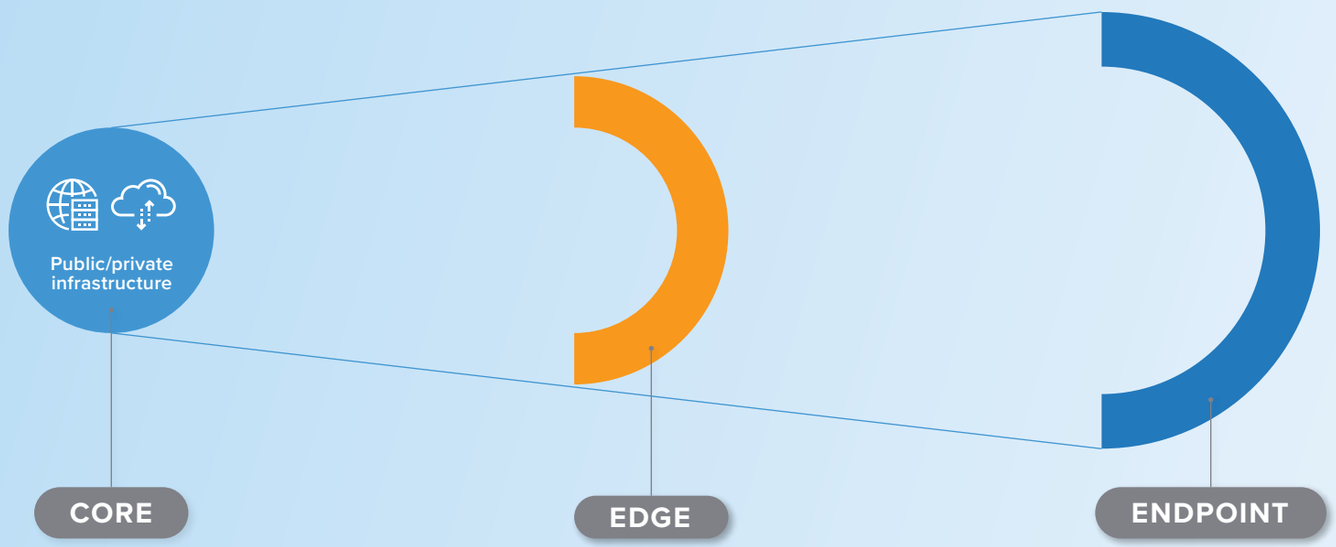
Retailers need to use edge to improve data access speed and performance, as well as to minimize the need to transmit data that does not require external process management (like payments approval) or have external access or storage requirements (like enterprise commerce systems or transaction logs). Cloud, network, and application performance must be optimized to ensure customer satisfaction. Data security is imperative in retail. Retail organizations face steep financial penalties, remediation costs, and brand damage due to data breaches. Moving data processing to edge datacenters closer to where data is generated optimizes network data traffic, thus increasing data transmission efficiency while reducing the size of the attack surface, which improves security.

Key Findings:

- Advantages of edge computing include increased bandwidth, immediate access to data through latency improvements, reduced costs associated with transmission and storage infrastructure, and improved security.
- Cloud computing and edge computing are complementary architectures.
- Edge computing architectures are highly dependent on business objectives. Personalized customer engagement, efficient omnichannel inventory and order management (pick, pack, and ship from store stock), store traffic insight and queue management, and customer self-service are enhanced with edge computing.

What Is Edge Computing?

Edge computing is a **distributed computing paradigm** that includes the deployment of infrastructure and applications outside of centralized datacenters and public clouds closer to **where data is acquired, analyzed, and acted on.**



By 2025:

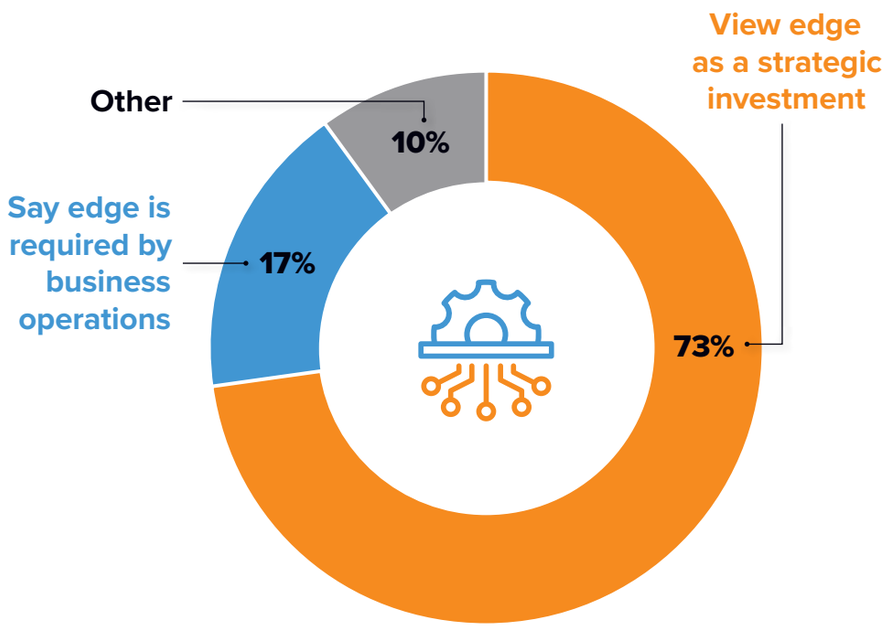
IDC Retail Insights predicts that **digital shelves, real-time inventory visibility, robotic fulfillment, and automated checkout** will accelerate investment in **store-connected edge platforms by two years** and **10 times over current forecast levels.**

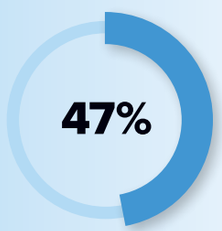
Edge Services: A Strategic Imperative

It's still early days for deploying edge solutions, but edge is a strategic component of digital transformation strategies.

Underlying retail trends

- The digital transformation of the store/enterprise
- Converged safety and security
- More advanced technologies deployed at the edge
- More nuanced cloud and edge decisions for better real-time and frequent use of data
- Advanced networking
- Internet of Things
- Next-gen payments
- Leveraging the benefits of scale, scope, speed, and cost of ownership



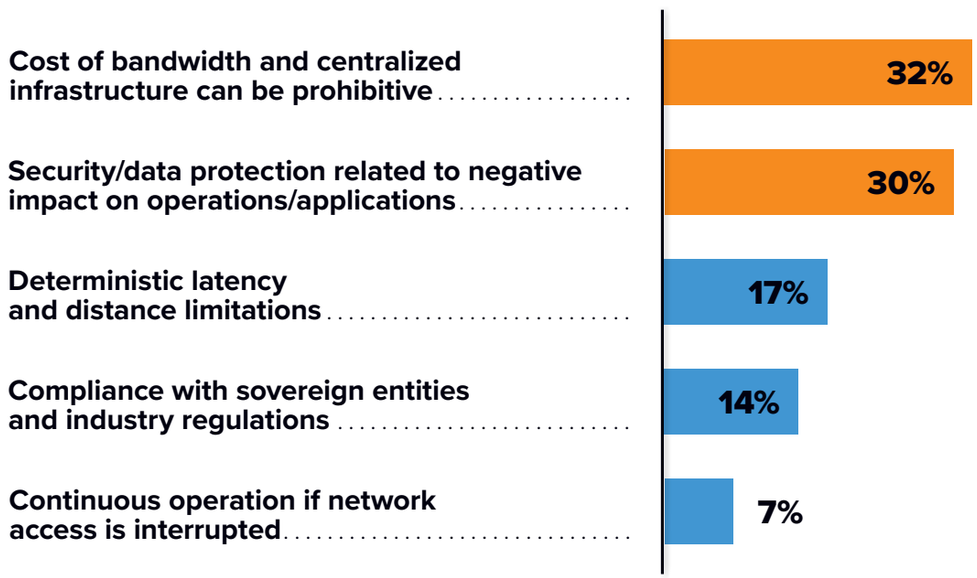


of organizations plan to invest in edge solutions in **less than one year.**

Note: % corresponds to number of respondents; total will sum to 100%.
n = 100, Source: IDC *Edge Services Thought Leadership Survey,* September 2020

Edge Improves Experiences and Performance

Primary motivations for deploying edge solutions



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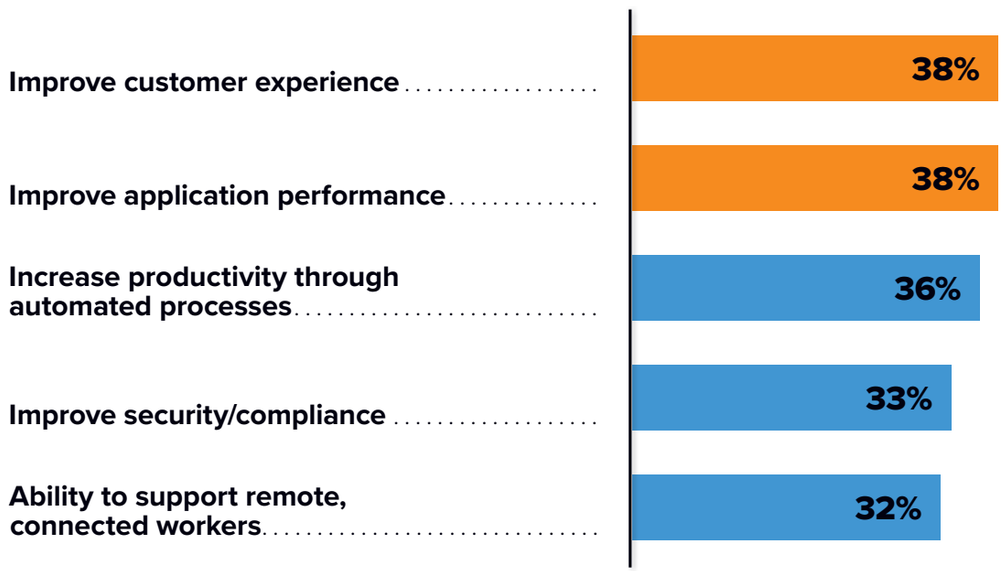
Top benefits expected from deploying edge solutions



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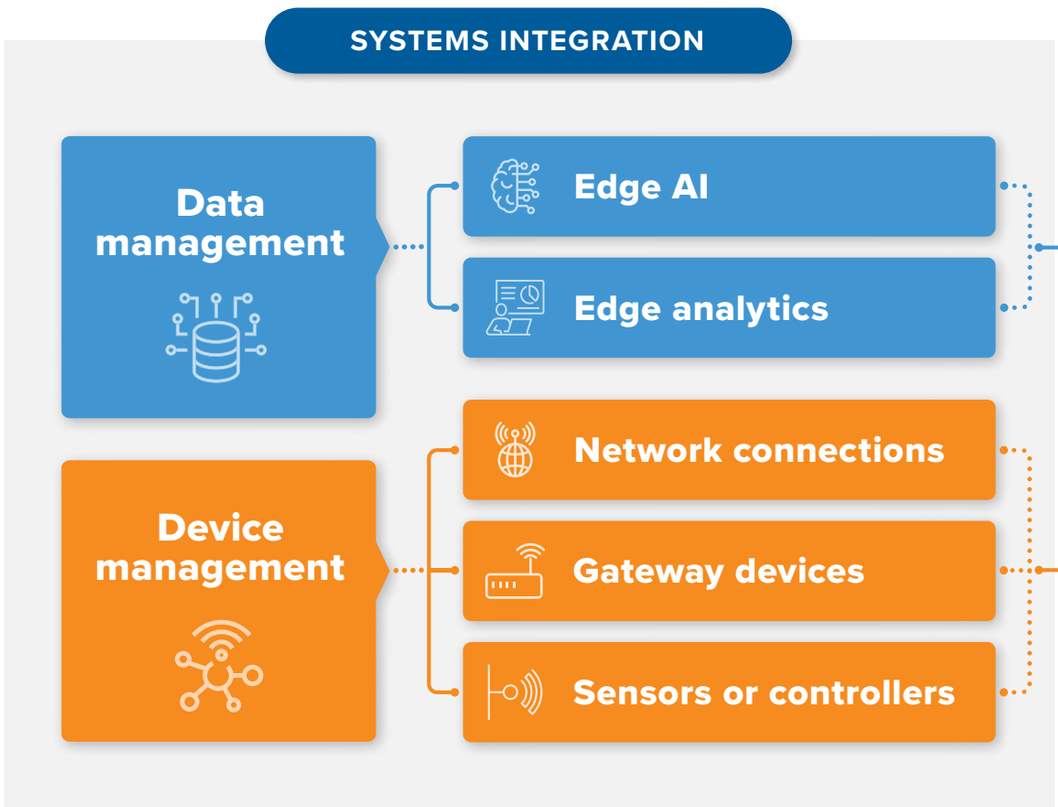
The Edge Platform for Contactless and Frictionless Retail Applications



Processing

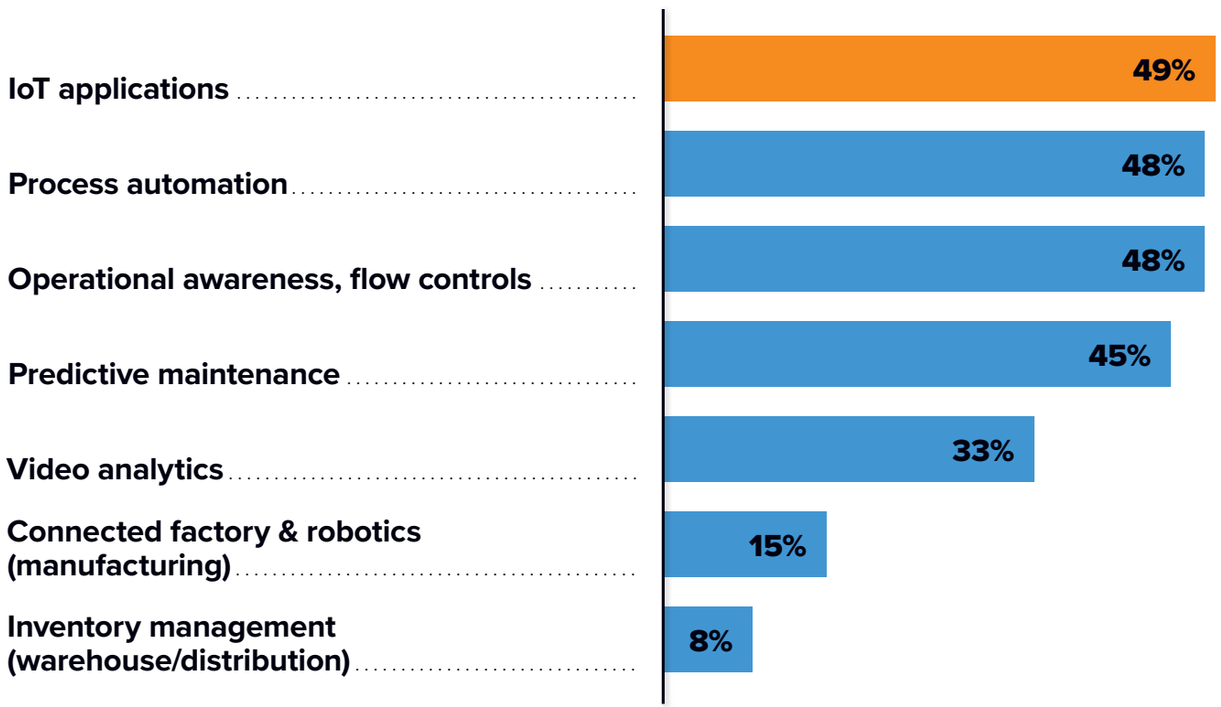
- Standard but flexible local connectivity
- Mechanisms for local data collection, aggregation, and distribution
- Centralized data control
- Frictionless infrastructure acquisition and app deployment
- Autonomous IT and standard IT governance

Sample use cases

- Computer vision and AI for fraud and loss prevention
- Enhance customer experience through 1:1 mobile and 1:many streaming content personalization
- Inventory management
- Buy online, pick up in store
- Pick, pack, and ship
- Omnichannel, intraday shelf-price changes
- Traffic insight, queue management
- Streamline, digitize, and integrate supply networks
- Risk management

Edge Can Meet Retail's Priorities

Main use cases for retail organizations considering edge intelligent solutions



Edge solutions address four key operational improvements for retail stores:

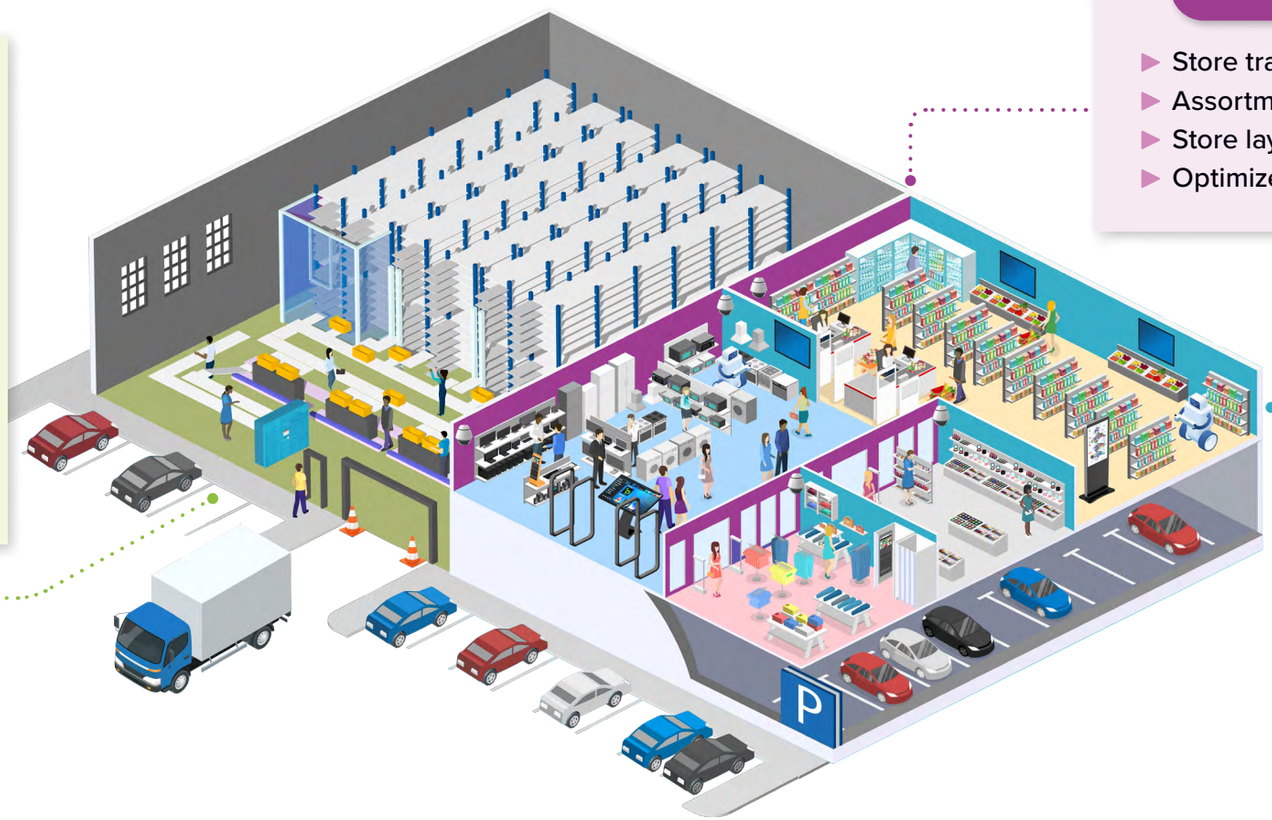
- **Mobile productivity:** Improved availability, security, and utilization of mobile, tablet, and checkout devices
- **Omnichannel data integration and decision process automation:** Large retail app aggregation for store operations, including sales, products, orders, and inventory
- **Flexible and responsive programs:** Real-time adaptive pricing, assortment, task management, and risk and loss management
- **Rich customer experience:** Personalized engagement, rewards, and support

Note: % corresponds to number of respondents; multiple dichotomous table; total will not sum to 100%.
n = 802, Source: IDC *Edge Services Thought Leadership Survey,* September 2020

A Seamless Digital Experience in Stores

STORE OPERATIONS

- Navigation assistance
- Advanced loss prevention
- Fraud prevention
- Risk reduction
- Task management
- Expedited pickup and delivery
- Returns management
- Physical security
- Inventory management
- Asset management



RETAIL INTELLIGENCE

- Store traffic patterns
- Assortment and inventory planning
- Store layout and planogram planning
- Optimized employee scheduling

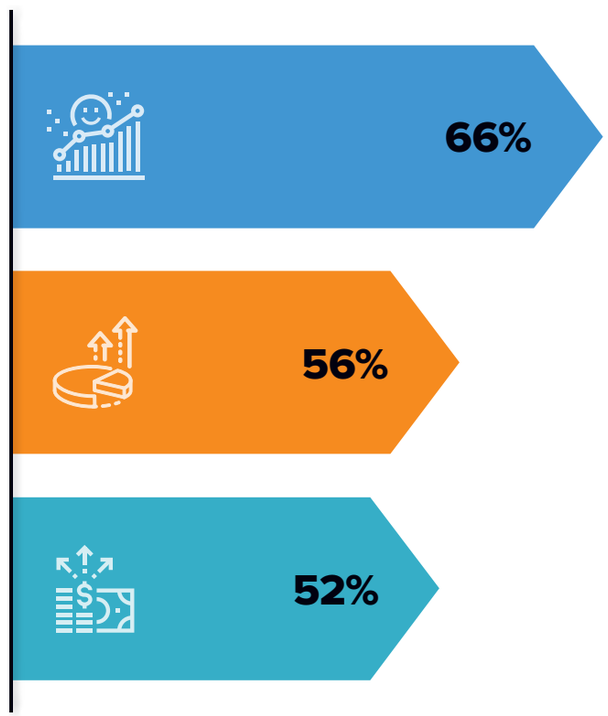
CUSTOMER JOURNEYS

- Navigation
- Employee assistance
- Contextualized promotions
- Product information and inventory availability
- Frictionless pickup and checkout
- Endless aisle

Keeping Data on the Edge Improves Business Outcomes

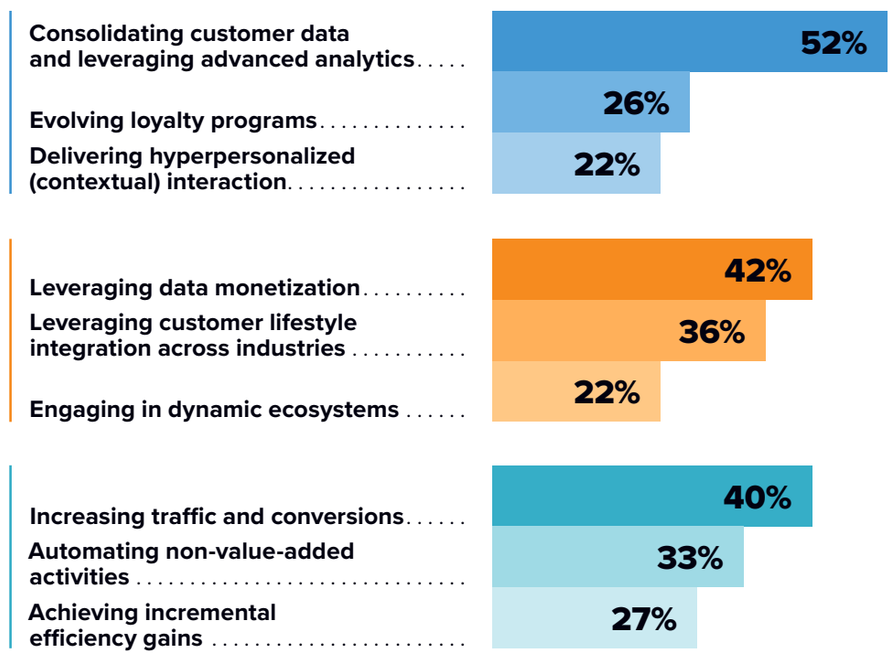
Most retailers (83%) expect to have access to data in real time or frequently.

The top three business transformation imperatives



Note: % corresponds to number of respondents; multiple dichotomous table; total will not sum to 100%.
n = 602, Base: all organizations, Source: IDC *Global Retail Innovation Survey,* June 2020

The top priorities that drive desired outcomes



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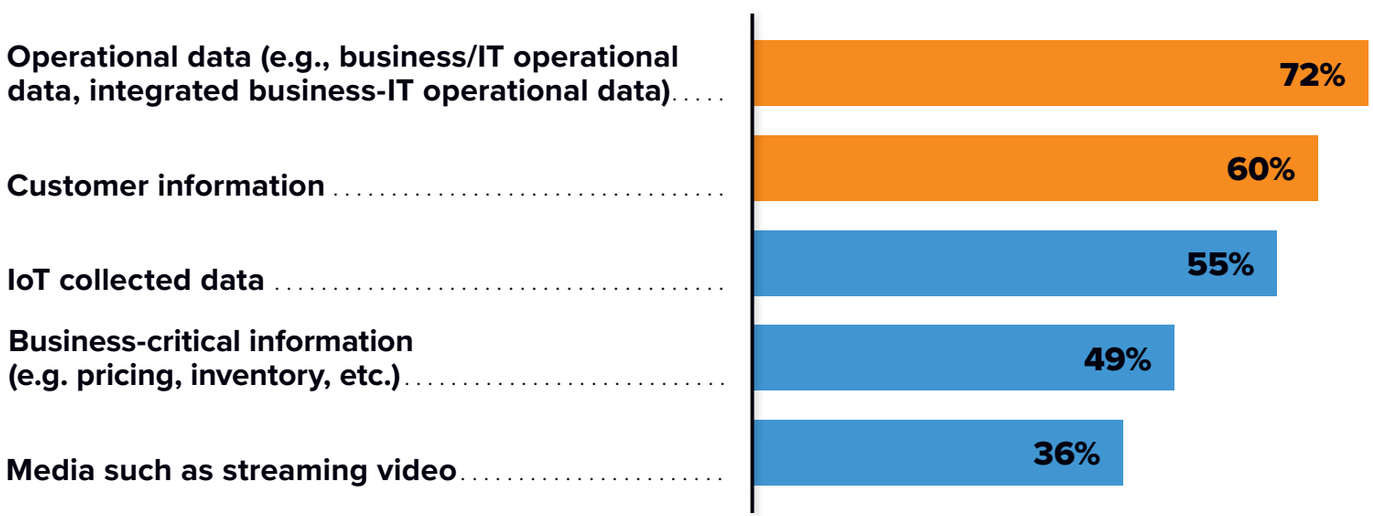
n = 100, Base = all respondents, Source: IDC *Edge Services Thought Leadership Survey,* September 2020

Tie Project Priorities to Improved Performance Metrics

Edge computing enables retailers to engage with consumers and employees to improve outcomes, including sales and profitability.

Q. What type of data or information does your organization plan on keeping at the edge?



Retailers are focused on improving KPIs:

- Customer lifetime value
- Omnichannel customer service levels
- Return on data
- Operational efficiency and productivity
- Customer loyalty and satisfaction
- Traffic and conversion rates

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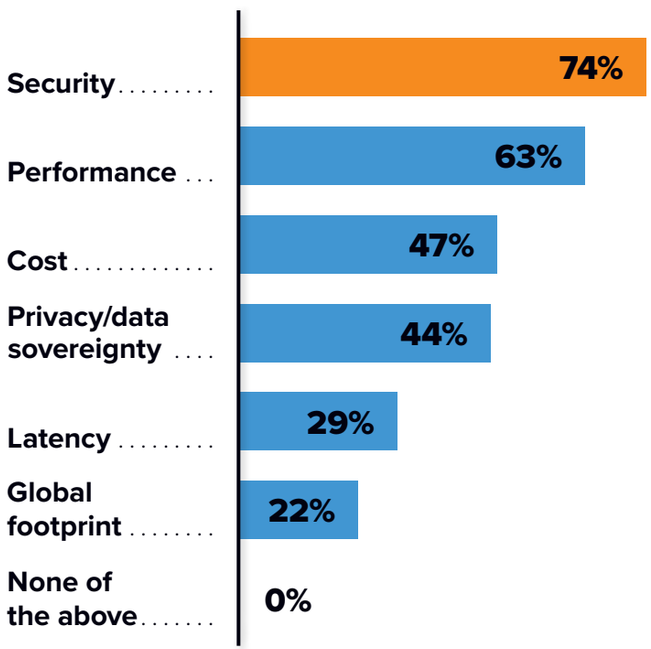
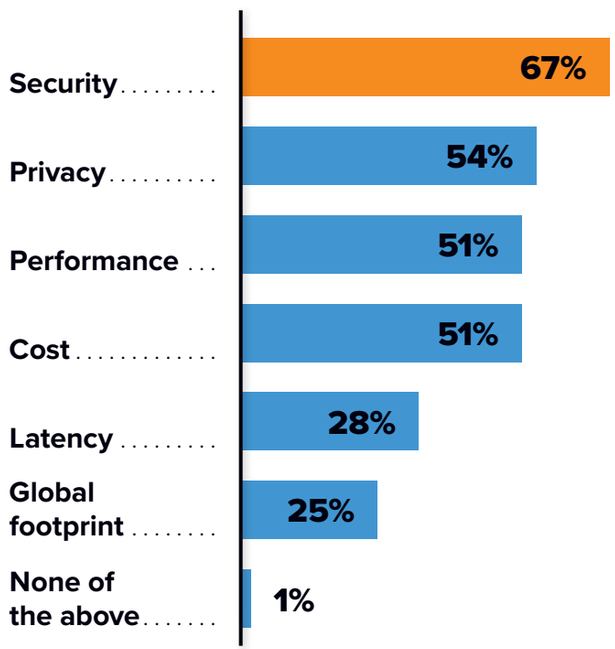
Security Tops Edge Services Considerations

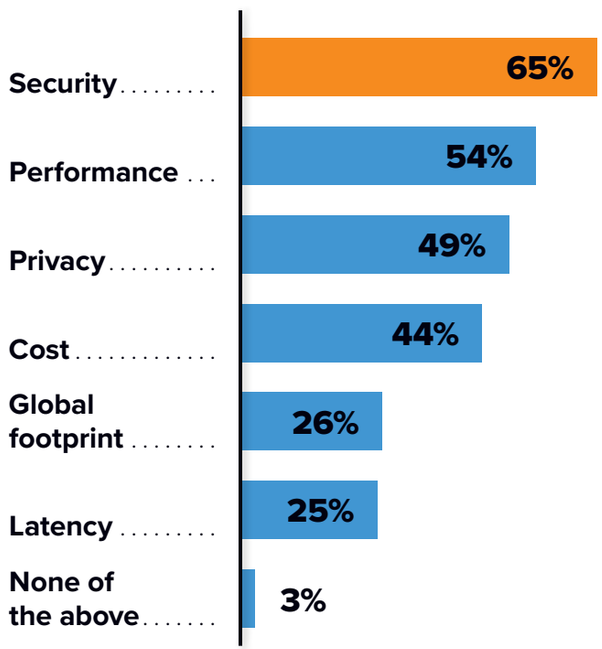
Q. What key considerations are important to your organization regarding **storage** (edge) services?



Q. What key considerations are important to your organization regarding **security** (edge) services?



Q. What key considerations are important to your organization regarding **app delivery** (edge) services?



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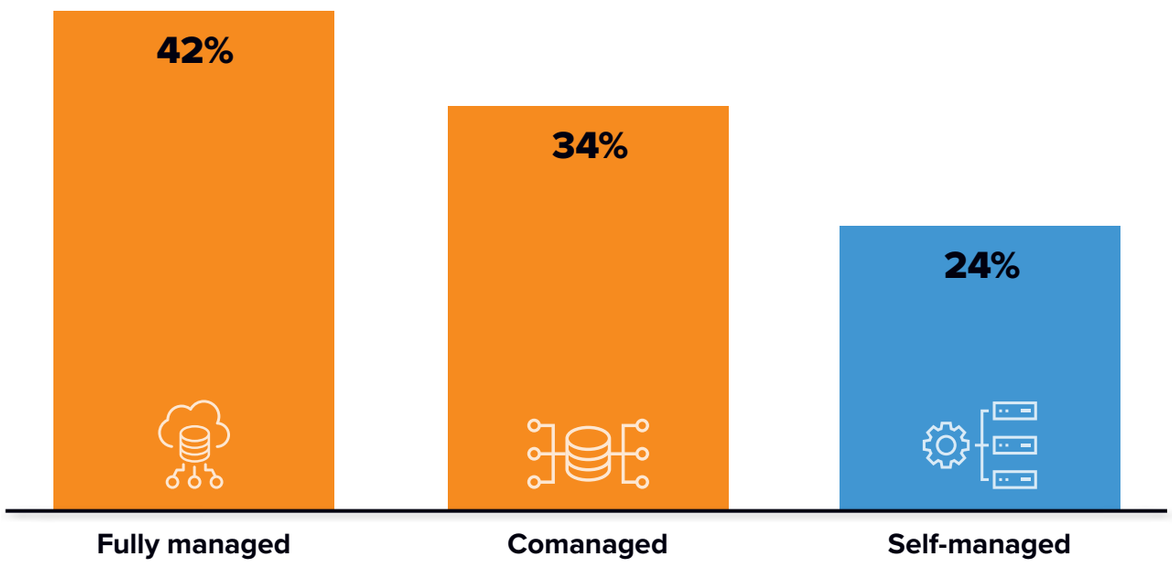
n = 100, Base = all respondents, Source: IDC *Edge Services Thought Leadership Survey,* September 2020

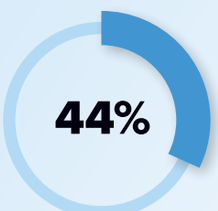
Technology Providers Are Key to Edge's Success

IDC predicts that by 2024, more than 75% of infrastructure in edge locations will be consumed or operated in a service model, as will more than half of datacenter infrastructure.

Q. Who manages your organization's edge solutions?



of organizations look to technology service providers as the **primary source of edge solutions.**



prefer a **managed service based on usage** or a **subscription** when considering new edge solutions.

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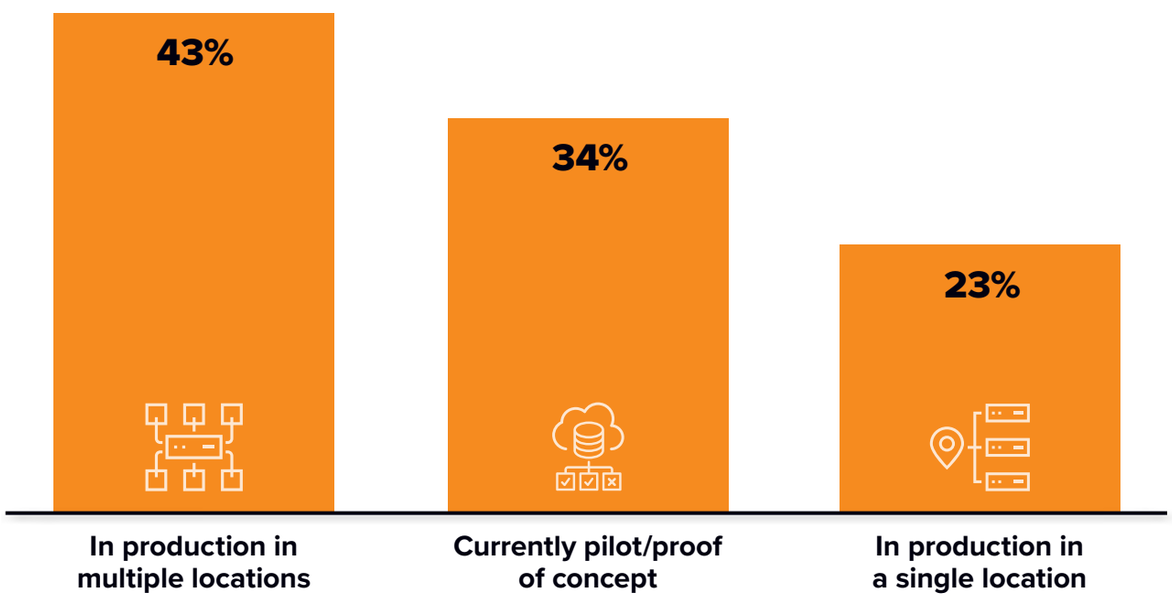
n = 100, Base = all respondents, Source: IDC *Edge Services Thought Leadership Survey,* September 2020

Edge Adoption Levels Are Increasing

As data requirements increase and cloud solutions come into play, edge solutions will become an increasingly important component capable of balancing responsiveness (latency), reducing costs, and driving personalized engagement in real time.

Q. Which of the following best represents your organization's adoption of edge solutions?



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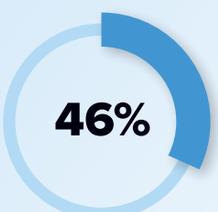
of organizations **treat edge solutions as capital expenditures.** They **own and operate** the solution.



of organizations **treat edge solutions as operating expenses.** They **pay for service** based on usage or subscriptions.

Essential Guidance

Articulate a vision for using edge computing and identify appropriate use cases to prioritize investments

Define key performance metrics for use cases to prioritize investments in edge computing and measure success

Include stakeholders and domain experts to define requirements

Take inventory of devices already connected to the network

Embrace data governance, establish data definitions, and determine how data from edge devices flows across the enterprise

Take a holistic approach to security; edge locations have less physical security than traditional datacenters

Seek a strategic relationship with your edge computing technology and services supplier

About the Analyst

Leslie Hand
Vice President, IDC Retail Insights

As Vice President for IDC Retail Insights, Leslie Hand is responsible for the research direction for IDC Retail Insights, and leads research related to the digital transformation of retail omnichannel operations. Hand works with retailers and technology providers on developing 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 includes a particular emphasis on mobile, IoT and augmented / virtual reality technologies and the threats and opportunities now facing the entire retail ecosystem from evolving consumer behaviors. Leslie likes to say that she will always be a retailer through and through, but in her current role she now has the opportunity to work for many top retailers and the technology providers that serve them.

More about Leslie Hand

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