Acumera®

Accelerate Innovation at the Edge

5 next-generation use cases for retail and hospitality

TABLE OF CONTENTS

The industry's best-kept secret is out and here to stay

Edge computing is the path forward for application delivery and management solutions for the physical world.

When I was first developing Acumera's Reliant Platform in 2006, edge computing wasn't an industry-standard term. We were the first to bring managed application, data delivery, and automation from the cloud to the physical store and restaurant. We quickly became a leader in this space. As the retail and hospitality technology landscape began to evolve and offer more robust technology options in customer experience and operations, we never missed a beat. Our platform evolved to be the leading edge computing solution to power our customers technology infrastructure across hundreds to thousands of locations.

Today, edge computing is at the heart of a paradigm shift in how technology drives business and innovation, not just in retail and hospitality, but across every major industry. The use cases for edge computing are vast, and most organizations have barely scratched the surface of edge implementation. Those who are investing in edge solutions are at the forefront of their respective industries. We work with restaurants that are creating new ways to ensure speed and accuracy in order fulfillment, retailers that are implementing omnichannel commerce and customer experience solutions, and convenience stores that are moving from monolithic systems and processes to deliver superior customer experiences.

At Acumera, we are driven by the needs of our customers, and we rely on regular feedback to inform our roadmap. We hope that this e-book sparks ideas about how edge might help your business, and we look forward to engaging in discussions with you about your particular goals.

Please connect with us on **LinkedIn** and **Twitter** or email our team at **sales@acumera.com.**

Sincerely,

Richard Newman
Creator, Acumera's Reliant Platform

Power your enterprise with an edge + cloud strategy

Convenience and speed are top-of-mind for today's shoppers and diners. The practices and behaviors implemented over the course of the past few years to foster a digitally transformed environment only expedited roadmaps necessary to stay competitive. Retailers and hospitality operators are facing new business and IT challenges, and need to respond to emerging requirements for cloud and web-based architectures. The most forward-thinking organizations are planning to or already harness edge computing to create more agile, reliable and cost-effective environments.

Are you ready to power your enterprise from the edge?

The cloud alone is simply not enough for today's enterprises of 25 to thousands of locations looking to scale next-gen technology with their legacy applications and systems. Implementing an edge plus cloud strategy across geographically dispersed retail, hospitality, food service or convenience store locations can certainly introduce new IT complexities. However, doing so with enterprise scale and proactive monitoring in mind provides significant advantages for flexibility, performance and security.

Acumera addresses these challenges by bringing together a customizable, hardware and cloud-agnostic edge computing platform to minimize downtime and maximize service performance, providing high availability and security for business-critical, on-premise workloads.

Retailers and restaurant operators plan to implement five major next-generation IT architectures over the next two to five years:

- **Internet of Things (IoT)**
- **Digital content**
- **Augmented and virtual reality**
- **Artificial intelligence and machine learning (AI/ML)**
- **Omnichannel payment**

With an edge computing platform supporting these technologies, you can enable hyper-convenient customer interactions and business agility at scale.

WHAT IS EDGE?

Ultimately, edge computing is all about converging digital and physical engagement—bringing data and applications closer to each end user. It is a critical counterpart to cloud computing. The core benefits are reduced latency, increased reliability and lower TCO over time, particularly for time-critical applications at scale.

Retailers must ensure redundancy to operate offline, should connectivity to the cloud be lost, as well as resiliency once connectivity has been restored. Vendors continue to add centralized services and micro services to the edge of the physical store—either on a local server, thin client or edge device.

Gartner Market Guide for Unified Commerce Platforms
Anchored by POS for Tier 1 and Tier 2 Retailers

IoT

IoT rules the new retail and restaurant landscape. These “internet of things” devices are pieces of hardware, such as sensors, actuators, gadgets, appliances or machines, that are programmed to transmit data interoperably over the internet or other networking structures.

How does edge support IoT deployment?

Managing distributed IoT devices across a large enterprise can be extraordinarily challenging. Edge computing provides a solution: individual devices connect to an edge platform, which offers a single point of management for a diverse set of systems from a centralized location.

IoT across the retail and hospitality landscape becomes most successful when it can be locally deployed at scale. IoT deployment can require multiple vendor relationships and technologies, so it’s important the enterprise anticipates that each implementation may have unique characteristics across management, monitoring and security requirements. Edge represents a predictable path by which retail and hospitality merchants can effectively deploy IoT for various consumer and operational use cases from one, single platform.

IoT use cases
and how they're powered with edge computing

Smart cameras and sensors

Edge delivers a localized foundation for your cameras and sensors across a wide array of IT protocols, hardware manufacturers and software vendors. Locally host your required applications with GPUs to leverage resources like existing camera data feeds for additional functionality such as exception-based reporting, machine vision/learning, product identification and next-gen customer analytics.

Smartphones, tablets and other handheld/wearable user devices

Edge provides a core foundation for the delivery and interoperability of any IoT edge device or application, making the end-user experience, whether consumer or employee (or both), more efficient.

RFID readers

Edge provides an optimal foundation to host RFID readers for both local processing and cloud integration in a high availability, hardware-agnostic configuration model. Wireless inventory trackers seamlessly integrate with OMS and supply chain initiatives under an edge computing infrastructure.

Security scanners

Data collection from a wide variety of vendors, endpoints and third-party devices like security cameras can be aggregated at the edge, creating thoughtful visibility across sensor and data security requirements.

What's next with IoT
+ how edge can get you there

1

Add more immersive IoT technology at scale

Edge provides a core foundation for the delivery of any IoT edge device or application.

2

Deploy a better data collection strategy across all IoT devices and vendors

Data collection from a variety of vendors, endpoints and third-party devices can be aggregated at the edge creating thoughtful visibility across sensor and data security requirements.

3

Implement an environmental monitoring capability for the overall IoT environment

Edge provides the capability to centralize and locally aggregate all sensor endpoint checks for availability and notification alerts creating the most flexible options for a wide variety of sensor connectivity types like zigby, Wi-Fi, serial, Bluetooth, etc.

Digital content

Global brands know that their digital and physical strategies must be in lockstep to meet their customers exactly where they are today. From personalized, in-store advertising to mobile-first clienteling and promotions, digital content remains paramount both inside and outside the four walls of your store or restaurant.

Where does edge fit inside a digital content strategy?

Bringing data and digital content closest to the consumers of that data is one of the primary justifications for edge computing. Edge eliminates unnecessary roundtrip or repetitive data intensive sessions over the traditional WAN, providing the optimal architecture to deliver digital content closest to every end user across myriad form factors and technologies.

Business benefit

Edge provides a resilient and more predictable delivery approach for customer engagement and overall experience.

Tech benefit

With edge computing, digital content can be synchronized and orchestrated from various endpoints and can be updated in real time or offline.

Digital content use cases
and how they're powered with edge computing

Digital walls or signage

Edge provides the capability to centralize digital content for distribution to a number of customer-facing endpoints and displays, even when connectivity is lost. fostering zero downtime and tight system resiliency.

Promotional signage

These applications can expose optimal integration points based on specific products and customer preferences for digital engagement. Edge is uniquely positioned to integrate stand-alone applications locally for personalized or general promotions, creating a better customer experience.

Local content delivery and management

While some approaches have content delivery managed at the cloud or at the device level, a more resilient and scalable option is to do this at the edge from a single platform, deployed at the physical location.

Interactive displays

Edge computing provides the foundation for monitoring, alert notification and data collection from consumer engagement patterns with interactive displays.

What's next with digital content
+ how edge can get you there

1

Add offline capabilities to digital signage

Edge delivers direct web services integrations with connected edge-driven media players to provide smart, offline capabilities.

2

Make digital advertising more personalized for each customer

Edge integrates stand-alone applications locally with minimal latency for customer-specific promotions.

3

Deliver digital content to mobile devices

Edge provides a central media hub for digital content distribution, serving up content to a variety of customer endpoints.

Artificial intelligence and machine learning (AI/ML)

AI/ML are quickly becoming the core of today's next-generation technology deployments, unleashing new capabilities for retail and hospitality. From completely AI driven drive-thru experiences to predictive fulfillment models, AI/ML simplify both repeatable and complex work loads, in turn providing new engagement models for customer experience.

Where does edge fit inside an AI/ML strategy?

Edge provides the flexibility and high computational power to deliver AI/ML applications and integrations, especially when leveraging a powerful resource like Intel® OpenVINO™ Toolkit.

Why AI/ML at the Edge?

Intelligent edge platforms provide exceptional performance for all your edge workloads, including built-in acceleration for AI and video analytics. AI performance is further boosted by technologies like TensorFlow, PyTorch or the Intel OpenVINO™ toolkit, which delivers optimized runtime performance based on the available processing components you've deployed at the edge, now and in the future.

Why should you consolidate on a single Intel edge server?

- Simplify your infrastructure
- Reduce your TCO
- Gain flexibility to scale your infrastructure

Business benefit

To stay competitive in today's marketplace, edge computing provides the foundation necessary to support the addition of AI/ML technology to deliver maximum impact and reliability for each end user.

Tech benefit

The cloud alone is simply not enough to transport and provide the large volumes of real-time data required to accomplish AI/ML initiatives. Edge provides the optimal low latency operating environment for systems generating decision-based data inside these next-gen technologies.

AI/ML use cases
and how they're powered with edge computing

Predictive analytics

Edge delivers unique peripheral device configuration and calibration on adjacent toolsets and applications to integrate with local decision-based data necessary for technologies like behavior tracking or heat mapping.

Scan-and-go/WiWO technology

Edge delivers interoperability between local cashierless applications and disparate hardware solutions for real-time integration, creating a more seamless customer experience at scale.

Natural language processing (voice-activated drive-thru)

Edge extends opportunities for AI/ML to integrate with interactive consumer ordering and drive-thru options, which require local processing for low latency across high computational architectures.

What's next with AI/ML
+ how edge can get you there

1

Stay competitive in today's marketplace with a world-class customer experience

Edge computing provides the foundation necessary to support the addition of AI/ML technology to deliver maximum impact and reliability for each end user.

2

Deploy a compute infrastructure powerful enough to accomplish next-gen initiatives across the enterprise

Edge provides the optimal low latency operating environment for systems generating decision-based data inside AI/ML technologies.

3

Stay innovative with the latest AI/ML technology relevant to your business

Regardless of the third-party or vendor chosen AI/ML applications, edge computing powers your tech stack with the networking power necessary to stay innovative.

Augmented and virtual reality

Staying competitive is top of mind for most retailers as next-generation technology is being deployed now at lightning speed. Augmented and virtual reality (AR/VR) helps retailers and restaurants stand out by creating a safe space to augment physical products as closely as possible to the real-world item. This is done with the help of computer-created sensory inputs, including video, graphics, GSP and other important data. AR/VR bridges the physical with the digital, creating a unique, memorable experience to immerse customers in your brand.

Where does edge fit inside an AR/VR deployment?

A properly deployed edge computing solution supports this kind of unique environment with optimal next generation integrations and application workloads, bringing all that data closer to each end user with greater ease, speed and security.

Business benefit

Continual additions of AR/VR technologies means more data and more IT spend for the business. With an edge computing platform, AR/VR can be deployed much faster and with reduced TCO over time, fostering a cost effective and reliable deployment and execution strategy.

Tech benefit

Edge computing provides the framework to support the continual additions of AR/VR technologies for a low latency customer and end user experience across your entire enterprise.

AR/VR use cases
and how they're powered with edge computing

Virtual fitting rooms

Edge optimizes the virtual try-on experience through an integration between various hardware manufacturers, merchandising/inventory systems and digital content. This produces a much more seamless customer and user experience.

3D menu selection

Edge consolidates your existing edge hardware, creating a much smaller hardware footprint for technologies like a 3D virtual menu item or product on-premise.

What's next with AR/VR
+ how edge can get you there

1

Deploy AR/VR capabilities on-premise

Edge optimizes AR/VR by integrating various hardware manufacturers, merchandising/inventory systems and digital content platforms.

2

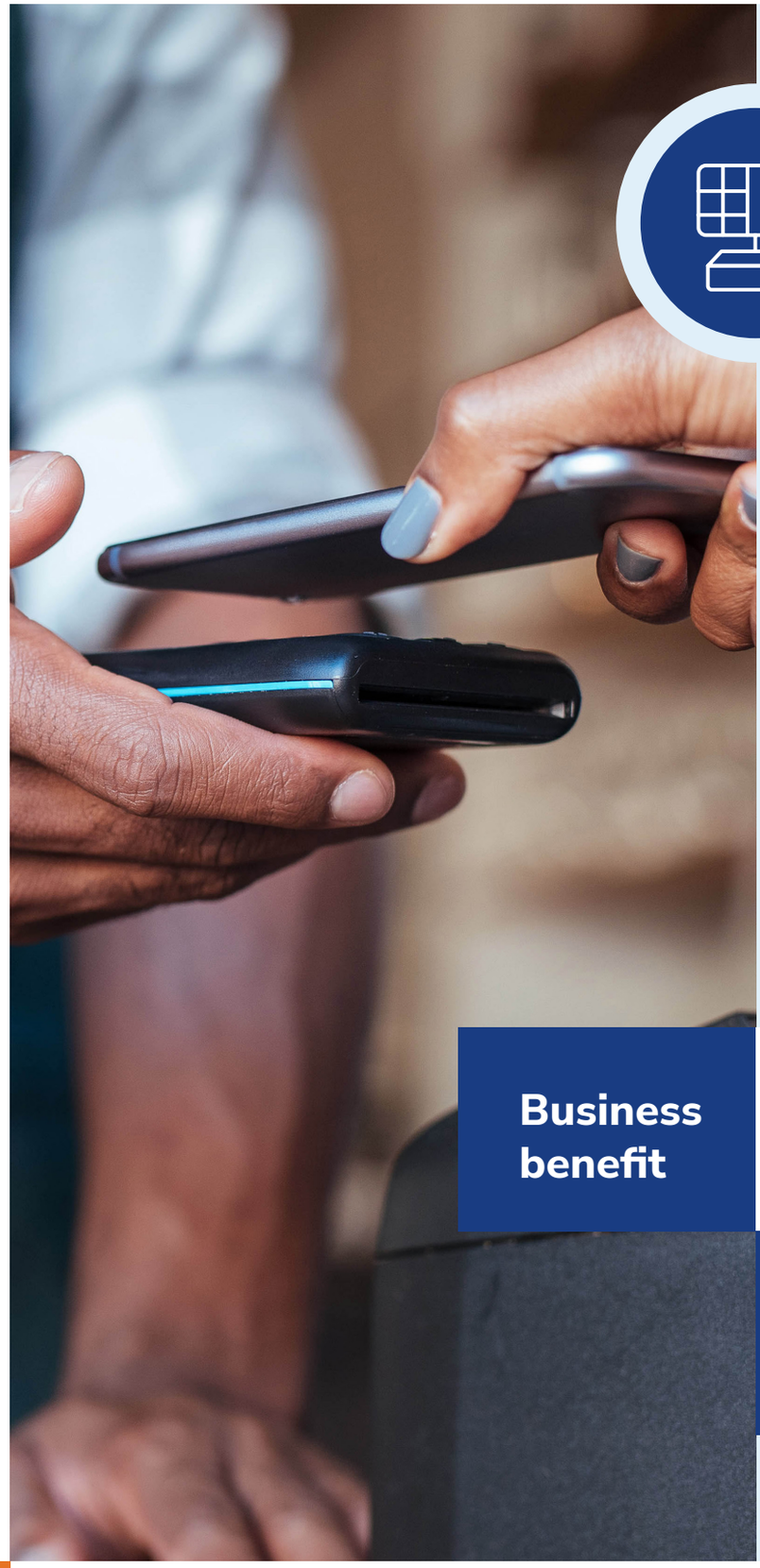
Remain within overall IT budget when deciding which AR/VR technologies are best to implement

Edge reduces your TCO overtime as you begin to create more innovative experiences, requiring more data and bandwidth.

3

Scale existing AR/VR initiatives

Edge delivers a seamless global experience, bringing the power of the cloud inside the four walls of each store or restaurant.



Omnichannel payment

To successfully do business with your customer, wherever they are on a day-to-day basis, an enterprise needs to have a multitude of payment platforms and options. Large retailers are grounded in high velocity transaction environments, which must support high interoperability between systems, predictable application deployments and ease-of-use for ongoing hardware support.

Where does edge fit into an omnichannel payment strategy?

Retail-based solutions are progressively moving to IoT and payment device centric implementations. When combined with highly available services, this facilitates a future-forward omnichannel payment model. Edge computing becomes the nucleus of the entire payment infrastructure and supporting systems: integrated network monitoring and alerts, advanced local data collection for high value analytics and high availability of payment service capability.

Business benefit

Merchants are now expected to offer multiple payment options, including traditional card-present terminal based tenders, digital app based, pay at kiosk, contactless and frictionless solutions. Edge provides the optimal approach for delivering these complex integrations with tightly integrated monitoring, data collection and full offline capability.

Tech benefit

Payment systems typically involve complex integrations across payment device hardware, applications and network infrastructure. Edge grants the capability to transform payment applications across all omnichannel payment endpoints in your enterprise.

Omnichannel payment use cases
and how they're powered with edge computing

POS virtualization

Edge empowers POS virtualization, which reduces costly, labor-intensive hardware upgrades. Edge facilitates high availability along with backup/snapshot capabilities to ensure continuous operations for all transactional systems.

Mobile POS (mPOS)

Edge delivers superior integration capabilities around all types of mobile offerings, allowing retailers to containerize applications so they no longer have to run on the same unmanaged POS workstation or server. Edge supports the ability to deliver local content, applications and VR capabilities, reducing latency and allowing integration of mPOS devices with clienteling functions.

Contactless payments

Edge empowers orchestration and interoperability between all your local applications for a real-time, integrated approach to monitoring, security and event notifications across your contactless payments environment.

BOPIS/ROPIS (in-store pickup)

Edge enables localized services like queue-based messaging and order management system (OMS) integrations for pickup lockers and/or shelves, even where there is a loss of connectivity.

What's next with omnichannel payment + how edge can get you there

1

Integrate next-gen omnichannel payment options with legacy infrastructure and aging POS hardware

Edge enables the ability to operate legacy POS and selling systems adjacent to your next generation digital payments.

2

Deploy a multi-functional IoT strategy to bridge the digital with the physical world

Edge simplifies mobile endpoint management by localizing your core applications, in turn massively reducing latency where speed is essential.

3

Virtualize legacy POS/BOH applications with other store/ restaurant system components

Move your existing or new POS workload to the edge and extend the lifespan through USB redirection for adjacent devices. This creates an environment that delivers full backup and service recovery capabilities.

ACUMERA

Harnessing the power of edge computing for retail and hospitality

Over the last 20 years, Acumera has provided solutions to meet the ever-changing technology demands of the retail and hospitality industries, culminating in Acumera's Reliant Platform. We understand exactly what it means for our customers to adopt, integrate and deliver value in an era of continually changing industry demands and customer expectations. Our roadmap has been guided by the voice that matters most–that of our customers.

Our clients:

- **Leading global and retail hospitality brands**
- **Variety of store formats**
- **25-1000s of locations**
- *Industry segments include*
  Luxury retail, specialty, big-box, C-Stores, QSR, casual, and fine dining

40,000+
Sites serviced

7,000+
Customers across verticals

450+
New locations monthly

A proven solution: Acumera's Reliant Platform

Create a flexible, future-ready environment by deploying the most resilient approach to delivering critical applications your team and customers require.

Acumera's Reliant Platform centralizes, automates, and controls the delivery and management of applications and infrastructure bringing data and solutions closer to where they are needed across the retail and hospitality enterprise.

EXPERIENCE FASTER TECHNOLOGY ADOPTION, INCREASED RELIABILITY, AND LOWER TCO with our hardware and cloud agnostic software solution. Acumera's Reliant Platform converges new and legacy systems into an integrated, scalable system through virtualization, containerization, centralized management and comprehensive monitoring.

ENABLE CONTINUOUS OPERATIONS that keep your most important data and applications operating even when the internet fails, so that your overall experience is met without interruption.

DELIVER REAL-TIME MONITORING CAPABILITIES with a foundation for monitoring, alert notifications and data collection from a variety of consumer engagement patterns across the enterprise.

EMPOWER HYPER-CONVENIENT CUSTOMER INTERACTIONS with solutions that reduce purchasing barriers.

ACUMERA'S RELIANT PLATFORM BY THE NUMBERS

75%
Faster in-field recovery

250k
Virtual machines and containers deployed

65.5M
Data configuration elements under management and orchestration

96x
Faster mean time to recover

Acumera®

CONTACT US TO LEARN MORE