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Qualcomm

The AI-Native Store™

The New Operating System for Physical Commerce

How Bluetooth, Spatial Intelligence and Edge AI Are
Becoming Retail's Performance Standard



The AI-Native Store: Designing the next decade of retail

How Bluetooth, Spatial Intelligence &
Edge AI Will Redefine the Physical Store



**“A new model is emerging:
the AI-native store: a store
that can sense what is
happening, understand it
instantly, and act
immediately.”**

Contents

- 01.** Executive Summary
- 02.** Beyond Digitalization:
The End of Passive Stores
- 03.** The BLE-Powered Store:
The Architecture Retail Will Run On
- 04.** Spatial Intelligence:
The New Competitive Advantage
- 05.** The Consumer Layer:
Stores Can Finally “Talk” to Shoppers
- 06.** The Associate Layer:
The AI-Augmented Workforce
- 07.** The Economics of AI-Native Retail
- 08.** The Retail Winners of 2030 Are the Ones
Who Go AI-Native Today

Powering the Connected and AI-Native Store: A Vision and Qualcomm Technologies Partnership

Omnichannel

Local e-Commerce / In-Store Fulfilment
Unified pricing across channels
Real-time inventory visibility
Seamless customer journey

Retail Media

In-Store Digital Touchpoints
Omnichannel campaigns
E-Coupons at the Shelf
In-Aisle Shopper Interactivity



High Precision & Data-Driven

Pricing/Picking/Stocking Automation
Product/Associate/Shopper
Proximity-based work
Traffic Measurement
Planogram Compliance
An Eye on Every Shelf (CV)
Item-Level Inventory Tracking
Workforce augmentation



AI powered

AI-enhanced workplace
AI-enhanced shopping
Personalized journey

Executive Summary

Physical stores still generate 80% of retail transactions, yet they remain the least digitized, least connected, and least intelligent part of the value chain. For years, retailers invested billions online while the store, which is the most valuable decision-making environment in commerce, remained largely blind.ⁱ

That is now changing.

A new model is emerging: the AI-native store: a store that can sense what is happening, understand it instantly, and act immediately.

This shift is no longer conceptual, it is already reshaping labor models, customer experience, store economics, and retail media.

Why AI-native stores matter now

Retail leaders face unprecedented pressure: rising costs, volatile demand, labor shortages, and increasingly complex omnichannel operations. At the same time:

- 75% of executives plan major store transformation in the next two years.ⁱⁱ
- 44% expect these investments to unlock +1.5 points of operating margin.ⁱⁱⁱ

- AI-native programs already deliver double-digit improvements in shelf condition, several-point reductions in stockouts, and 60–90 minutes saved per associate per day.

Retailers are not experimenting, they are searching for a repeatable architecture that scales.

The architecture for AI-native retail is finally:



Bluetooth Low Energy (BLE): the universal, open, smartphone-native signal layer connecting of devices.



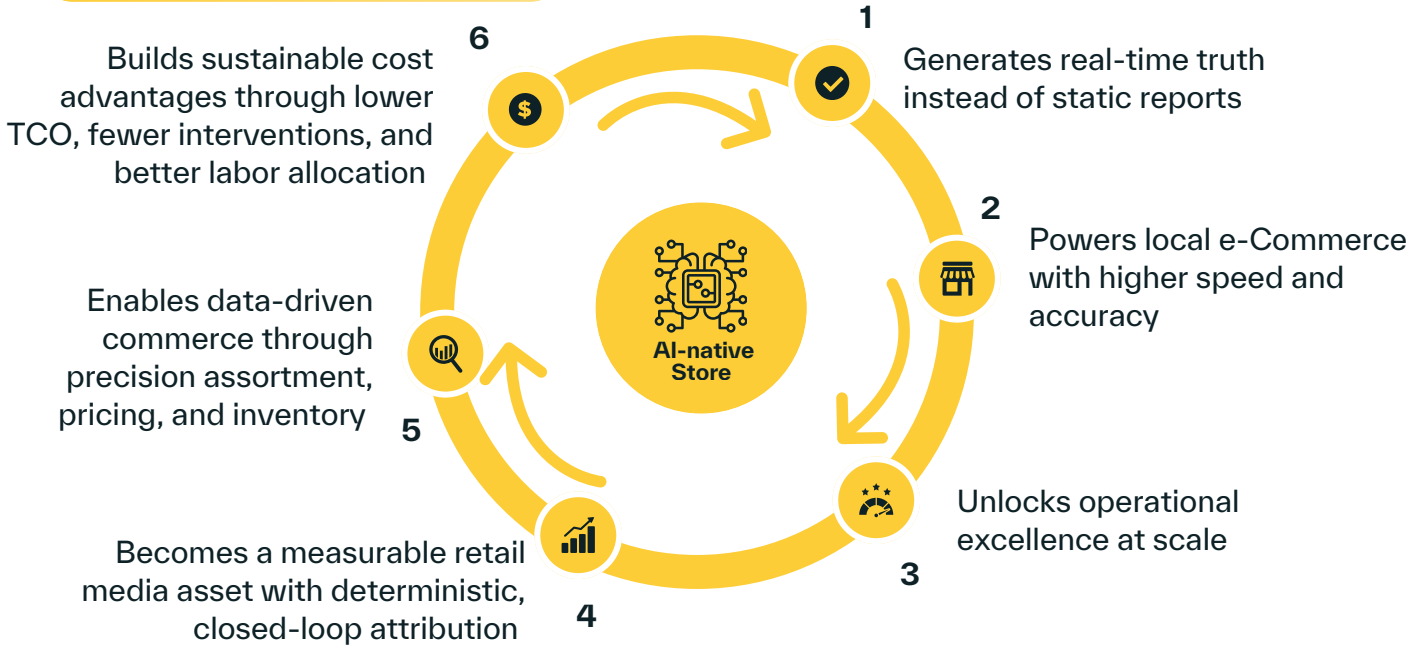
Edge Intelligence: shelves, sensors, displays, and rails acting as continuous, high-quality sources of real-time truth and Edge Compute.



Millisecond-level perception running directly in the store, reducing latency, cost, and cloud dependence powered by Qualcomm® technology.

Together, these technologies turn every shelf, product, journey, and task into actionable and enable a store model that is not only more advanced, but more economical.

What AI-native stores unlock



This is not only a technology upgrade. It is the new baseline for stores that intend to compete on margin, retail media and omnichannel performance.

AI-native stores are already scaling. The only question is which retailers will define the standard and which will inherit it.

Why it matters

Early AI-native store deployments show:

- ✓ Double-digit improvements in shelf condition
- ✓ 60–90 minutes of labor saved per associate per shift
- ✓ Dramatic reduction in total cost of ownership through BLE-native and EdgeSense infrastructure
- ✓ Several-point reductions in stockouts
- ✓ Up to 1.5–2 points of operating margin upside for large-scale programs

This is the foundation the rest of this paper explores.

Beyond Digitalization: Entering the Age of the AI-Native Store.

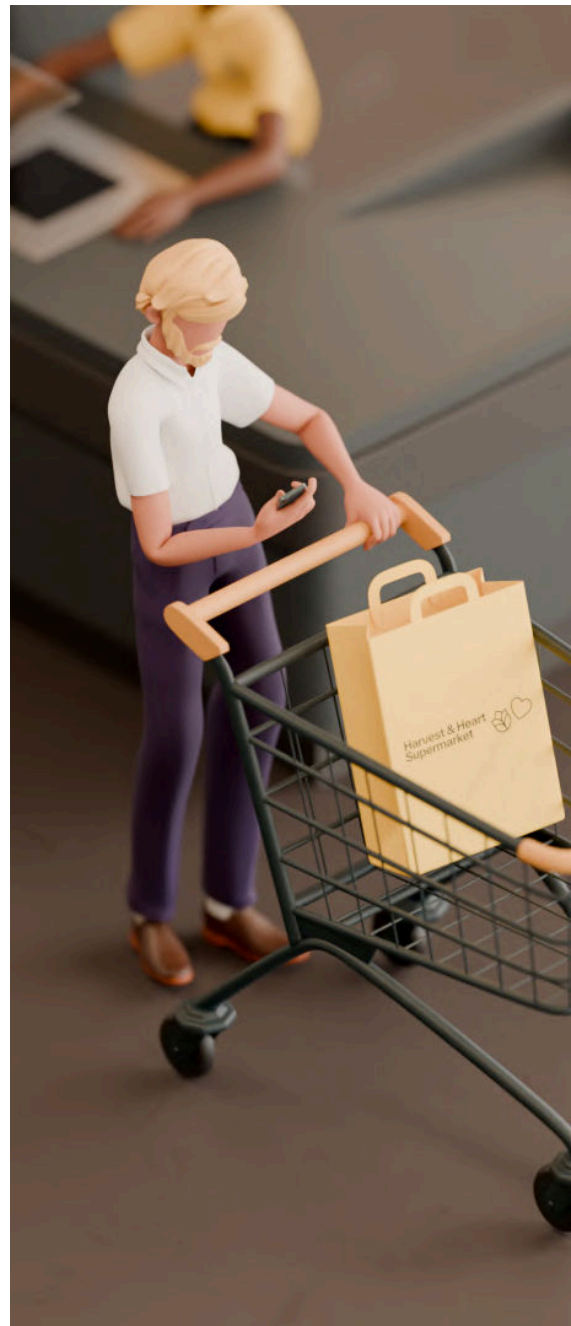
Digitalization provided critical systems like POS, inventory, and commerce integrations that form the foundation for AI-native capabilities. While these systems improved connectivity, they did not enable real-time sensing or autonomous action. AI-native stores build on this digital base by adding BLE infrastructure, EdgeSense, and on-device AI to transform data into immediate, actionable intelligence.

Digitalization connected the store, but it did not make it intelligent. The result: an environment that informed yet still slow, reactive and overwhelmed.

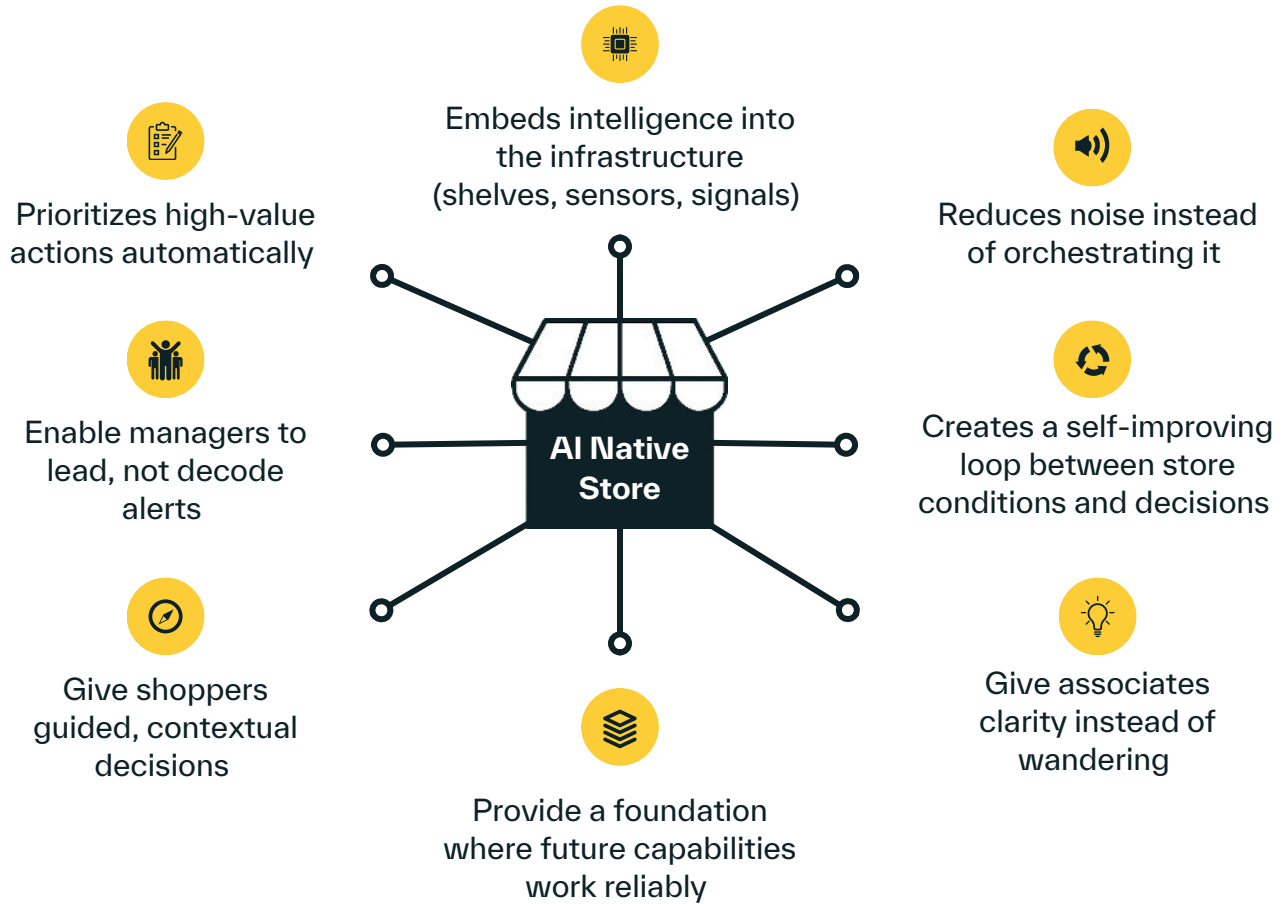
The AI-native store changes this entirely as three breakthroughs have converged:

- BLE-native shelves, sensors, and displays continuously streaming spatially accurate signals
- AI agents (LLMs) that require real-time physical context
- On-device AI delivering millisecond inference inside the store

This shift is not analytical, it is operational and immediate.



Why AI-native is not just an “intelligent store”, it goes further:



Digitalization was the first chapter.

AI-native stores are the next chapter and they operate in real-time.



The BLE-Powered Store: The First AI-Native Retail Infrastructure

AI depends on dense, reliable, real-time signals. Legacy store infrastructures were never built for this kind of intelligence. They are limited, energy-heavy, and closed. **BLE changes that.**

Bluetooth Low Energy has become the universal communication standard in the store: open, global, smartphone-native, and powering billions of devices. EdgeSense and QTI technology it turns the shelf edge into a connected, intelligent asset.

BLE-native infrastructure is fast, efficient, and economical:

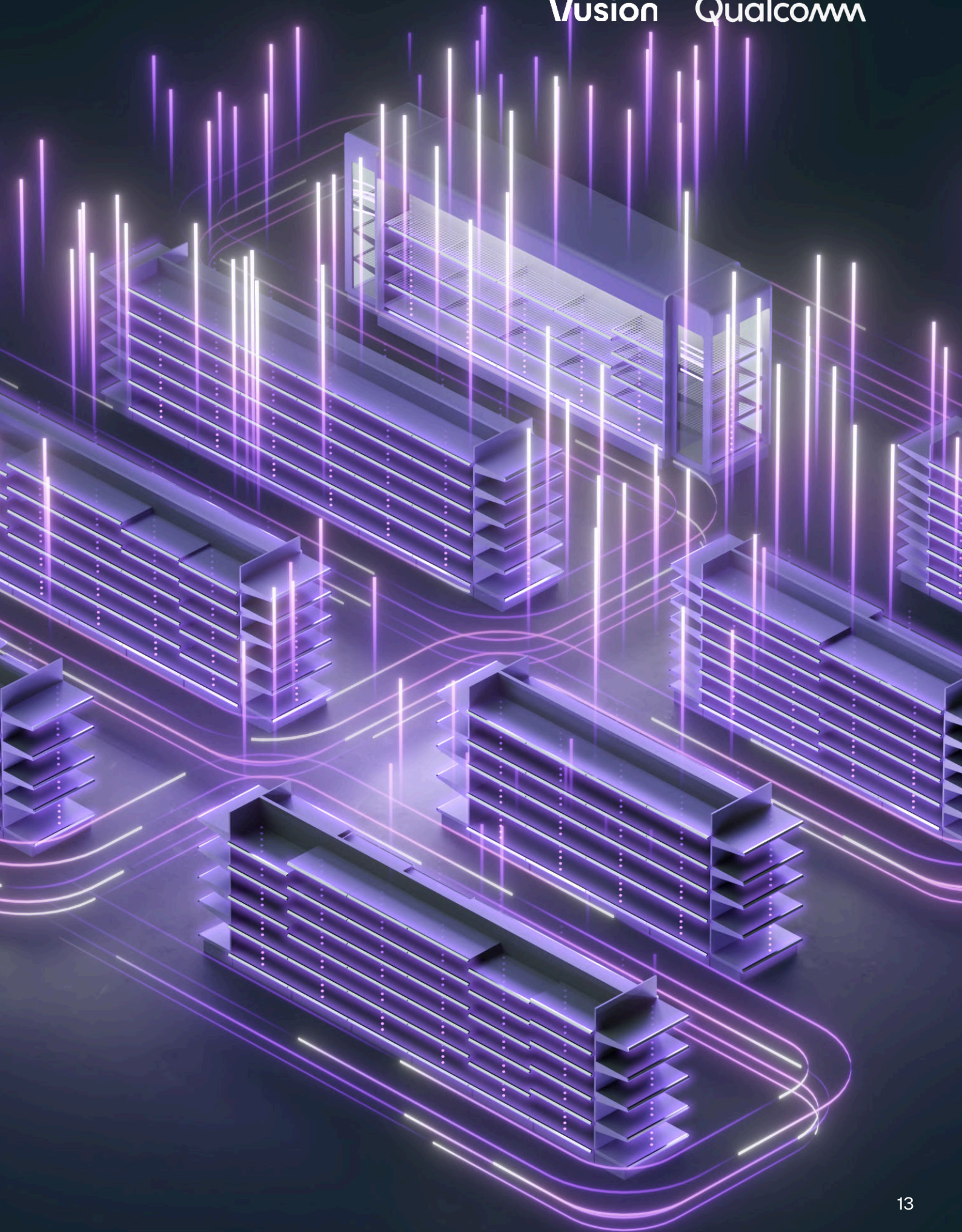
- Updates that once took minutes now happen in seconds.
- EdgeSense mutualizes energy across the rail, dramatically reducing the number of batteries needed and lowering battery-related TCO by up to 85%.*
- Instead of maintaining thousands of isolated devices, retailers maintain a single, shared infrastructure.

In practice, the store becomes a continuous sensor:

- Shelves detect gaps, misplacements, and interactions automatically
- Tasks emerge instantly and reach the right associate
- Local e-commerce picking becomes faster and more accurate
- Retail media screens react to stock, dwell time, and interest
- Product, planogram, and availability data stay aligned in real time

BLE-powered stores are AI-ready by design. What once required heavy servers now happens on the shelf and the edge, powered by On-Device AI. With BLE as its signal layer, and EdgeSense enabling real-time sensing and energy optimization, and On-Device AI, the store becomes a performance engine: sensing, deciding and acting in real time.

*Vusion analysis



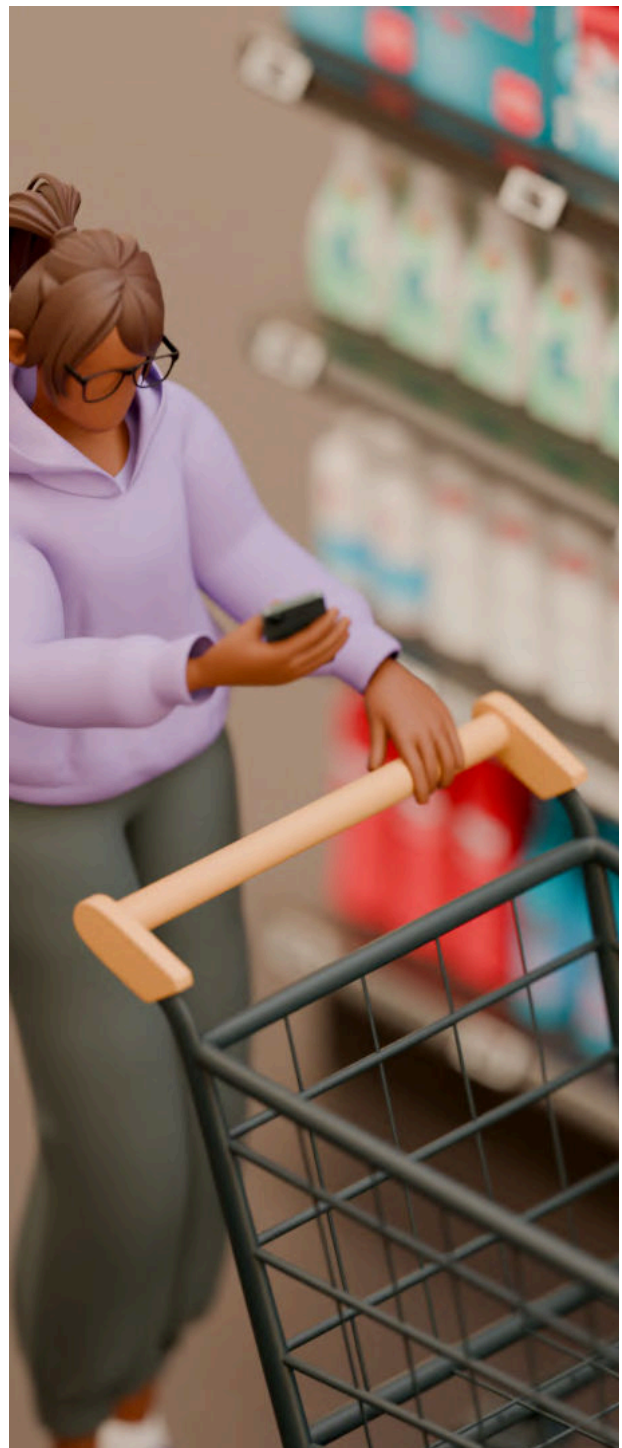
Spatial Intelligence: The New Competitive Advantage

For the first time, physical retail can achieve spatial awareness: a real-time understanding of what is happening in every aisle and at every shelf.

With EdgeSense and BLE-derived signals, the store begins to understand its own context. Spatial intelligence, along with integration with supporting technologies upon maturity, unlocks capabilities:

- Personalized, in-aisle engagement based on real behavior
- Real-time tasking and dynamic workload allocation for associates
- Predictive picking paths for local e-Commerce
- Automated planogram and availability verification
- Shrink reduction through anomaly detection and movement patterns
- AR navigation and guided product discovery

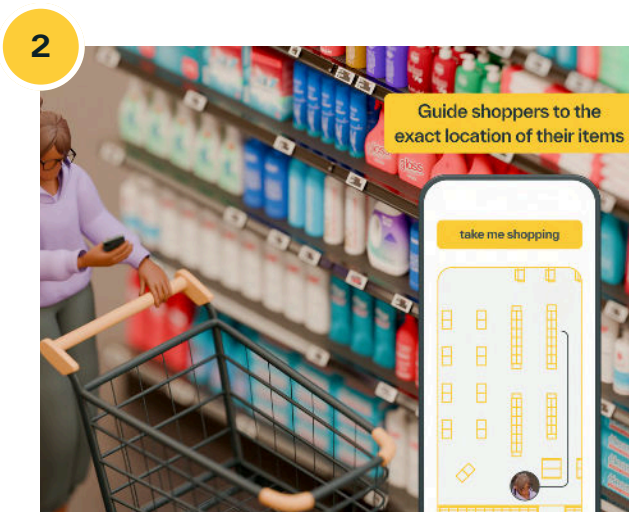
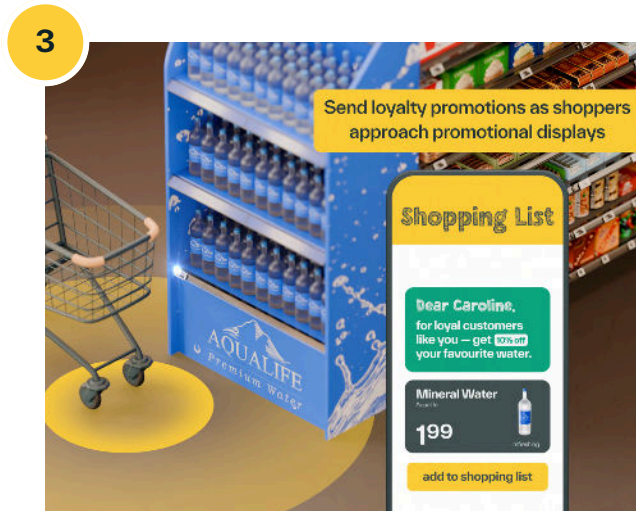
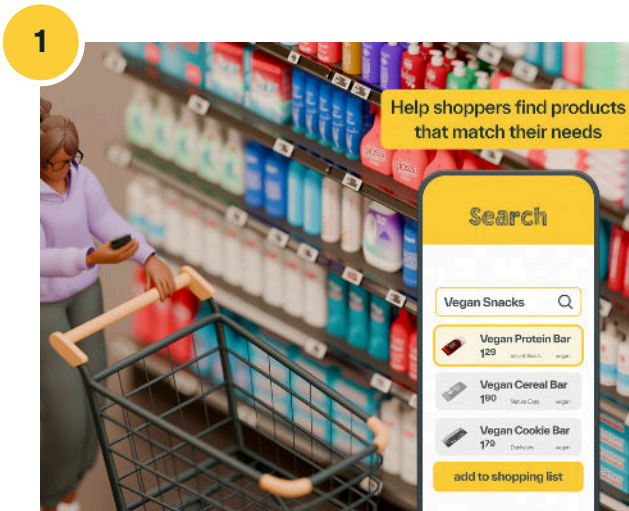
Spatial signals not only inform operations, but also enable contextual retail media, triggering content based on proximity and engagement.



Emerging wearables such as smart glasses rely natively on BLE for presence, positioning, and guidance, reinforcing BLE not just as store infrastructure, but as the foundational protocol for future consumer and associate devices.

Spatial intelligence enables faster, guided actions by providing real-time context for decision-making and task prioritization.

It is the competitive frontier of the next decade of retail.



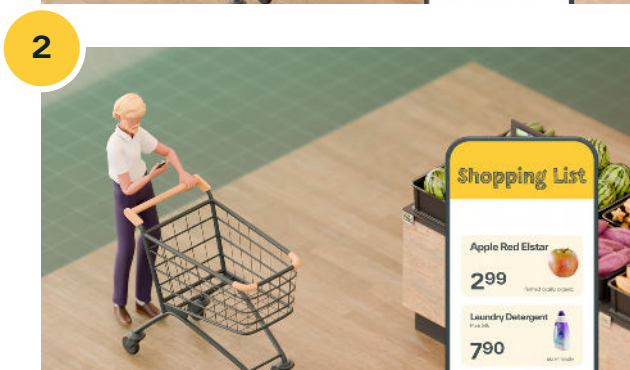
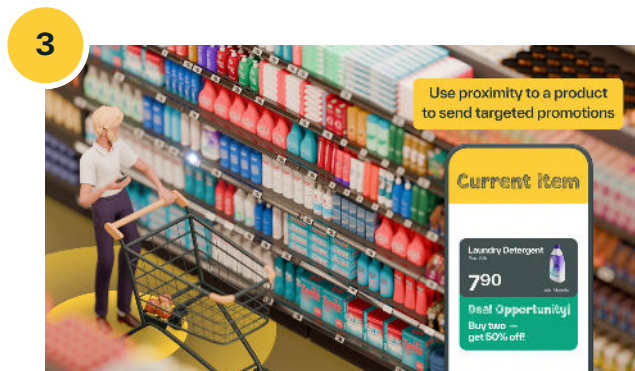
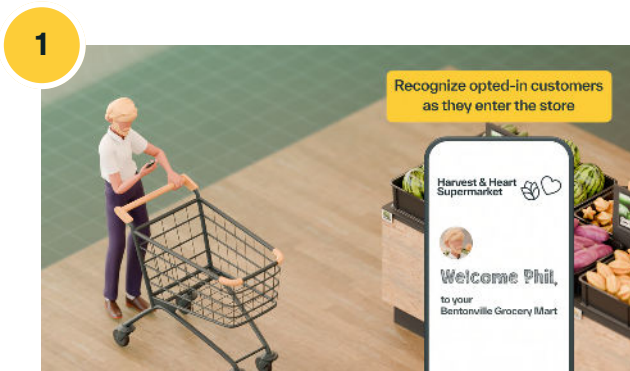
The Consumer Layer: Stores Can Finally “Talk” to Shoppers

Shoppers already live in a Bluetooth world. Their phones, earbuds, wearables, and emerging smart glasses communicate through BLE by default, but until now, the store could not speak back. **An AI-native store changes that.**

BLE-powered infrastructure enables proximity-based engagement and lays the foundation for personalization when integrated with shopper identity and consent systems.

This is not digital signage. It is context-aware assistance in the aisle, in the moment, at the decision point.

The same intelligence powers real-time in-store digital retail media. Because the store understands dwell, time, product interaction, stock levels and purchase outcomes, and with integration with POS systems, transaction data and advanced analytics platforms, media can finally operate like online campaigns: targeted, measurable, and closed-loop.



Impressions are not inferred; they're verified. Uplift is not estimated; it's observed directly on the shelf.

Retailers gain a new high-margin revenue engine. Brands gain deterministic attribution for in-aisle engagement. Shoppers gain relevance instead of noise.

AI-native stores:

- ✓ Offer contextual help, comparisons, and guided decisions
- ✓ Reduce friction and confusion in complex categories
- ✓ Adapt content to behavior, presence, and availability
- ✓ Provide deterministic, closed-loop attribution for retail media
- ✓ Deliver consistent, high-confidence experiences in moments that matter

The consumer layer is no longer passive. In an AI-native environment, the store becomes a participant in the shopper's journey: helping, informing, reacting, and converting in ways that were simply impossible before.



The Associate Layer: The AI-Augmented Workforce

Too often, associates can be the last to benefit from technology. Digitalization gave them more systems, more alerts, more apps, but not more clarity. Most of their day is still spent searching, checking, walking, confirming, and correcting. **AI-native stores finally reverse that.**

When shelves sense, signals flow, and tasks emerge automatically, associates move from reactive routines to guided, high-impact work. Instead of hunting for problems, they resolve the few that matter, quickly, confidently, and with context.

Example: An associate begins a shift. Instead of walking aisles blind, they start with a simple, prioritized set of actions generated from real store conditions: what needs attention, where it is, why it matters, and how to fix it. Everything else disappears into the background noise where it belongs.

The store becomes quieter. The work becomes clearer. The day becomes easier.



AI-native stores don't overwhelm associates with more tools, they remove friction. EdgeSense, BLE signals, spatial intelligence, and on-device AI shift the job from inspection to action, from firefighting to customer-facing impact.

AI-native stores:

- ✓ Cut 60-90 minutes of manual checking and walking per shift*
- ✓ Turn replenishment into a guided, efficient flow
- ✓ Make e-commerce picking faster and more accurate
- ✓ Help new team members perform like experienced ones through contextual guidance
- ✓ Reduce stress by removing ambiguity and constant multitasking
- ✓ Free associates to spend more time serving shoppers, not hunting for problems

The associate becomes an empowered operator inside an intelligent environment, not the human glue holding disconnected systems together.

AI-native stores don't automate people out. They augment people up.



*Vusion analysis






The Business Case: Four Engines of AI-Native Retail Performance

AI-native stores don't create value in just one place, they create value everywhere. When shelves sense, tasks prioritize themselves, shoppers interact with context-aware touchpoints, every part of the retail P&L improves.

The business case becomes obvious across four core value engines, each amplified by BLE, EdgeSense, spatial intelligence, and on-device AI.





A. Store Operational Excellence

AI-native stores eliminate blind spots and manual routines, creating faster, more accurate, and more scalable operations.

-  Double-digit improvements in shelf condition*
-  Several-point reductions in stockouts
-  60–90 minutes saved per associate per day
-  More accurate planograms and fewer compliance gaps
-  Real-time detection replacing slow, periodic manual checks

B. Local e-Commerce

AI-native stores transform the economics and reliability of store-fulfilled online orders. With spatial intelligence and BLE-powered sensing:

-  Picking routes adapt dynamically to real store conditions
-  Product availability and substitutions reflect the exact state of the shelf
-  Misplacements, phantom inventory, and anomalies are corrected before they affect orders
-  Picking becomes faster, more accurate, and more predictable






Operational excellence is no longer achieved through effort, it's built into the environment.

*Vusion analysis

C. Data-Driven Commerce

When shelves produce structured, continuous signals, retailers gain an unprecedented level of precision.

AI-native stores enable:





-  Real-time digital twins that reflect the store's true conditions
-  Precision retailing: on-shelf availability, facings, and assortment tuned to actual behavior
-  Better local inventory decisions based on live movement, not historical guesswork
-  Reduction of safety stock and improved working capital efficiency
-  Closed feedback loops for merchandising, replenishment, and forecasting teams

Retailers move from static planning to a continuously adaptive model, improving both revenue and capital productivity.

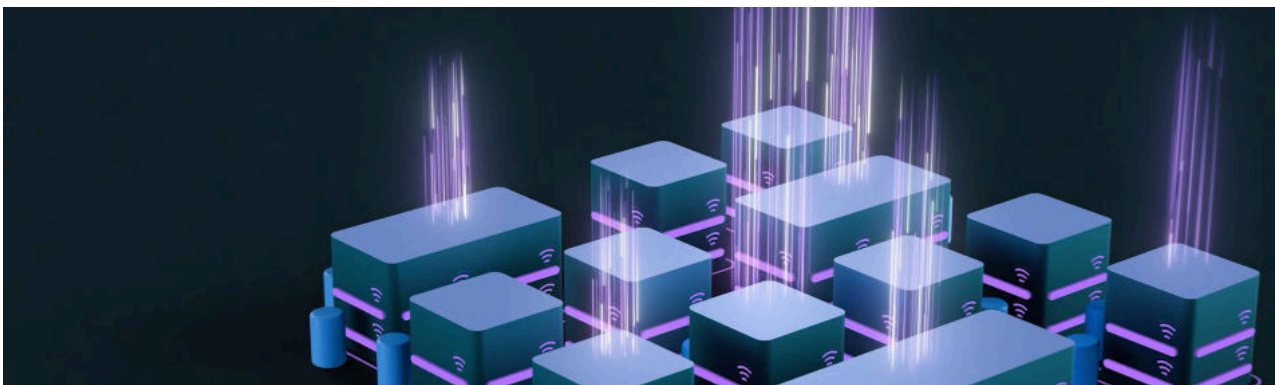
D. Retail Media & Shopper Experiences

Retail media is the fastest-growing value engine and AI-native stores unlock its full potential.

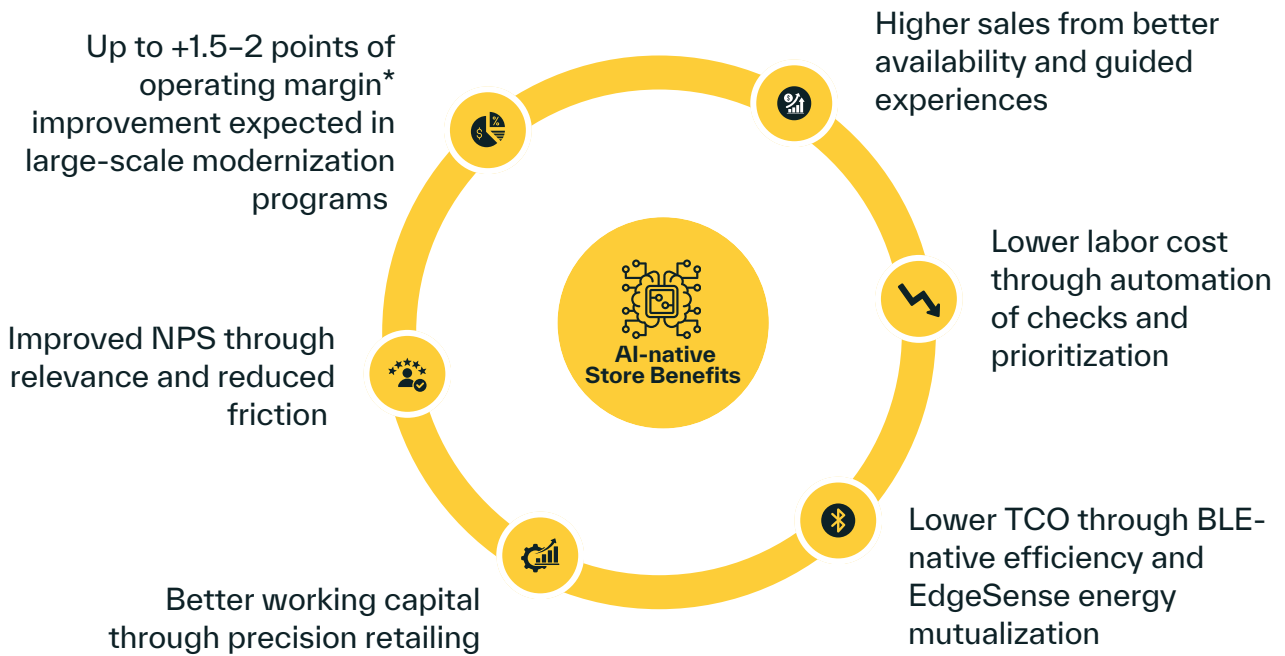
Because BLE and spatial intelligence link footfall, intent, interaction, and stock status, retail media becomes:

-  Context-aware: content adapts to dwell, availability, and behavior
-  Deterministic: impressions are verified, not inferred
-  Closed-loop: uplift is measured at the shelf, not measured weeks later
-  Integrated: promotions, pricing, content, and execution align seamlessly

Brands gain transparency, retailers gain high-margin revenue, and shoppers gain clarity in complex categories.



Across all four engines, AI-native stores deliver compounding benefits:



AI-native stores deliver ROI immediately in labor, accuracy, execution, personalization and automation. Such environments can unlock as much as 2 additional margin points; a transformative shift in low-margin sectors where even 0.1 points matter. ^{iv}



*Vusion analysis

Conclusion: The Retail Winners of 2030 Are the Ones Who Go AI-Native Today

AI-native stores will outperform traditional stores the way e-Commerce outperformed catalog retail. This is a platform shift, not a feature.

BLE-powered infrastructure, EdgeSense intelligence, and on-device AI do more than modernize stores, they change the economics of retail.

Costs fall. Productivity rises. Availability improves. Media becomes measurable.

And every new capability retailers aspire to, personalization, AI, agentic commerce, depends on this foundation.

The retailers who embrace this model early will set the new performance standard.

Their stores will sense faster, act faster, and grow faster.

They will run simpler, leaner, and smarter operations, with better customer experiences and higher-margin revenue streams.

The ones who delay will spend the next decade trying to close a widening gap.

The AI-native store is no longer an idea.

It is already taking shape and redefining what it means to operate a store.

Retailers who deploy AI-native stores will win the next decade.

i «Closing the digital gap: why connected stores are the future of retail», Kearney Report, page 8

ii «The Store is Striking Back as a Tech-Enabled Space Driving Efficiency, Experience and Monetization, Bain & Company and Vusion Report - <https://www.bain.com/insights/the-store-is-striking-back-as-a-tech-enabled-space-driving-efficiency-experience-and-monetization/> , page 8

iii «The Store is Striking Back as a Tech-Enabled Space Driving Efficiency, Experience and Monetization, Bain & Company and Vusion Report - <https://www.bain.com/insights/the-store-is-striking-back-as-a-tech-enabled-space-driving-efficiency-experience-and-monetization/> , page 8

iv «Closing the digital gap: why connected stores are the future of retail», Kearney Report, page 22

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