Edge AI Platforms for Next-Gen Retail Experiences

Driving intelligent devices and connected environments to enhance business outcomes

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Editorial: Retail's Turning Point

Retail is changing faster than ever. Expectations inside the store have never been higher and the cost of falling short is immediate. PWC[1] reports that one in three customers will abandon a brand they love after just one negative experience. Yet, a five percent increase in retention can increase profitability by 25 to 95 percent[2]. With global retail spending projected to surpass $53 trillion by 2035[3], stores are under pressure to deliver seamless, personal and reliable experiences every day.

Retailers are accelerating their use of AI in 2025 because three forces are reshaping the retail environment. Shoppers now expect tailored recommendations, helpful associates and frictionless journeys. Competition remains intense as "phygital" experiences become the norm and customers move fluidly between the brick and mortar store and digital touchpoints. Supply chain strain continues to disrupt product availability, making real time visibility essential.

The most meaningful gains will come from improving experiences inside the store. 82% of U.S. shoppers and 74% globally want more human connection in retail[1]. Technology is becoming the bridge that enables this. When employees are supported by intelligent systems that handle repetitive tasks, improve on-shelf accuracy and surface insights instantly, they can focus on being present and engaged. AI enhances merchandising, streamlines floor operations and equips associates with the right information at the right moment. The result is a more confident and empowered workforce that can offer real warmth, trust, and expertise. This is how technology elevates customer experience and brings genuine human interaction back to the center of retail.

The retailers who lead the next chapter will use edge AI to see what is happening in every aisle and respond the moment it matters. That intelligence creates smoother operations, stronger margins, and better in-store experiences that keep customers coming back.

MediaTek is helping lead this shift. Our Genio application processors, advanced modem technologies, commercial display solutions, and rich partner ecosystem work together with a complete software stack to make edge AI development faster and more scalable. This foundation supports the next generation of connected and intelligent retail experiences. Read on.

- CK Wang

VP & GM of IoT Business Unit, MediaTek

[1]*Experience is everything, PWC*
[2]*The Value of Keeping the Right Customers, Harvard Business Review*
[3]*The Retail Industry Market, Market Business Insights*

Modern Retail Redefined Through Intelligent Operations and Experiences

Modern retail scales best when technology stays subtle and service stays human.

A modern retail store feels effortless and is human-led, but it is technology behind the scenes that makes it so. Shoppers walk in for a product and expect speed, relevant guidance, smart suggestions, and a smooth checkout without breaking the experience. When inventory, shelf monitoring, replenishment, merchandising, and safety systems connect, the store runs like a smoothly functioning cohesive system. Sizes stay ready on the floor, backroom hunts shrink, displays refresh with real demand, and teams remain present. That is how retail scales. Operations run quietly in sync, while every visit feels intuitive, personal, and genuinely cared for. Employees are able to stay fully present because retail technology acts as the backbone. Customers feel delighted by personalized styling tools, smart mirrors, and conversational kiosks. The result is a visit that feels intuitive and warmly assisted, driving higher conversion, fuller baskets, fewer drop-offs, and stronger loyalty.

Operational Excellence That Makes Retail Reliable

Behind the modern retail operations is intelligent automation that keeps the store accurate, stocked, and seamless. It turns the backroom proactive, keeps security discreet but strong, and continuously manages shelves, ambience, and visual merchandising so the store stays polished and ready. In modern in-store retail, experience is everything and loyalty is fragile. Intelligent operations make that experience reliable. And when reliability meets responsiveness, the store becomes a place customers want to keep returning to.
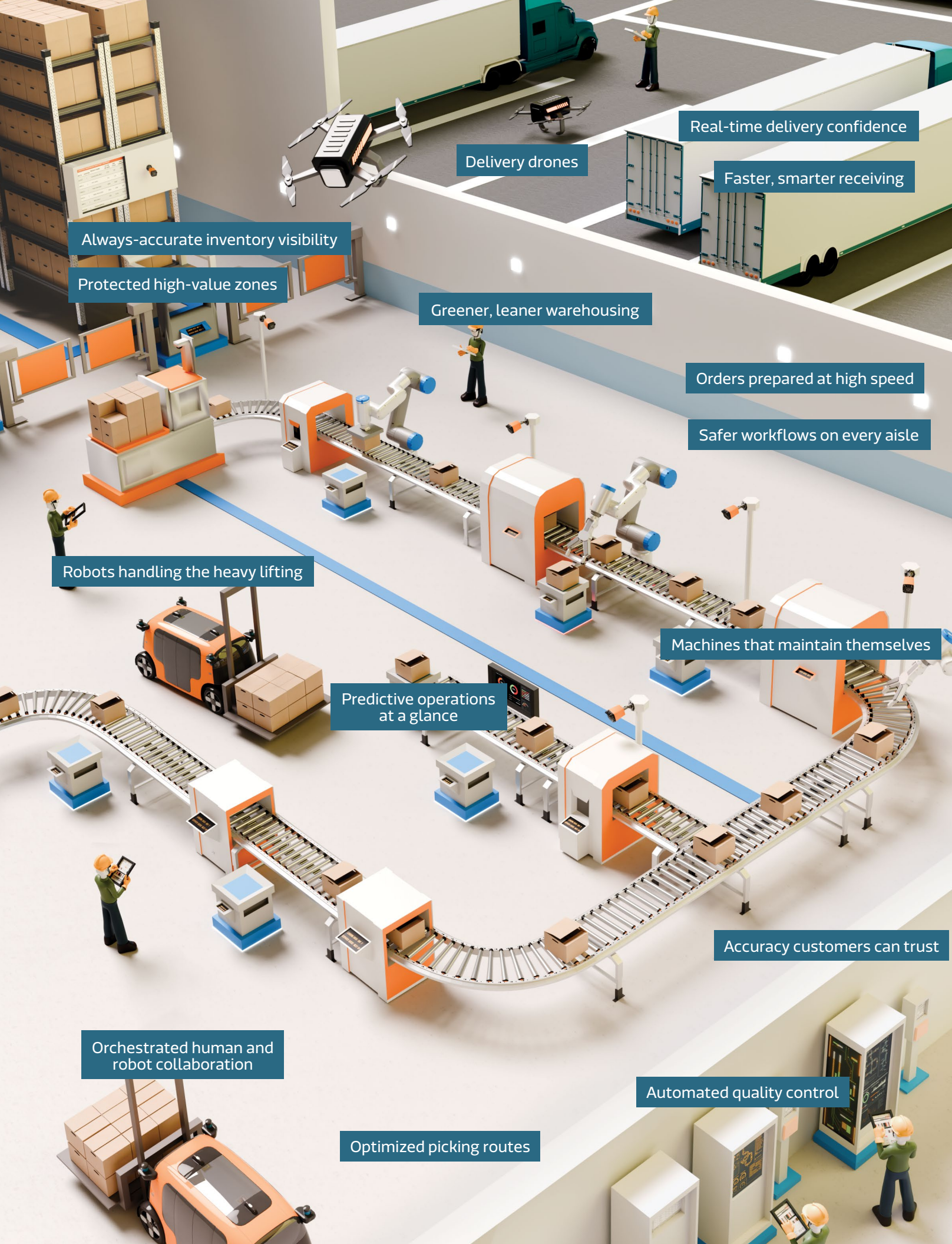
Customer Experience That Feels Curated and Human

Technology has become the quiet enabler of exceptional customer service. Personalized styling recommendations powered by Gen AI, assisted by in-store associates, help customers discover outfits, jewelry, and accessories that truly match their preferences. They also highlight complementary pieces that inspire natural cross-sell and upsell opportunities. Smart mirrors and virtual try-on stations remove friction and elevate confidence in high-value purchases.

32%

of shoppers will walk away from a brand they love after just one bad experience

(Source: QSR PwC, "Experience is Everything")

Demand-based lighting

In-store trending displays

In-store intelligence

Automated shelf monitoring

Smart mirrors

Personally curated styling sessions

Smart security to protect high-value products

Smart conversational kiosks

Handheld device checkouts

Frictionless checkout

Real-time delivery confidence

Delivery drones

Faster, smarter receiving

Always-accurate inventory visibility

Protected high-value zones

Greener, leaner warehousing

Orders prepared at high speed

Safer workflows on every aisle

Robots handling the heavy lifting

Machines that maintain themselves

Predictive operations at a glance

Accuracy customers can trust

Orchestrated human and robot collaboration

Automated quality control

Optimized picking routes

How AI and Robotics Transform Warehouse and Logistics Operations

Logistics sits at the core of supply chain performance. It covers how goods move in, how products are stored, and how finished goods travel to customers. As businesses grow more global and demand becomes less predictable, logistics managers need sharper tools to control cost, risk, and service levels in real time. AI is now embedded in transportation systems, warehouse platforms, and IoT devices that track vehicles, containers, cargo conditions, and routes. It forecasts demand, plans shipments, optimizes warehousing, and predicts transit times. It flags at risk orders and lanes, suggests alternative routes and carriers, and feeds clear signals back into planning, customer service, and inventory management. The result is a logistics network that is becoming more visible, more proactive, and less dependent on manual intervention.

Operational Excellence Through Connected Intelligence

As supply chains expand, operations now rely on embedded intelligence to keep throughput stable and decisions precise. Edge AI, sensors, cameras, and automation provide continuous monitoring, fast adjustments, and unified control across inventory, equipment, and transport. What once operated in silos is now connected through real time data across warehouse logistics and transport networks. Operations become more synchronized, efficient, and resilient to disruption.

Customer Experience Built on Predictability and Transparency

When operations run on connected intelligence, the benefits carry directly into delivery performance. Customers see fewer delays, fewer errors, and clearer expectations at every stage of fulfillment. Predictive routing, real time order visibility, and automated quality checks turn logistics into a consistent, transparent service. These capabilities strengthen trust and reduce costly exceptions, ensuring logistics operations run reliably and predictably at scale.

Visibility is good. Instant visibility is transformative.

By 2026,

Three out of four enterprises will use AI automation to cut warehouse inefficiencies by up to 25 percent
(Source: *Gartner Supply Chain Automation Forecast, 2024*)

Elevating Every Visit:

How Tech Transforms QSR Operations and Experience

Technology has become the central nervous system of modern Quick Service Restaurants (QSR). Customers expect fast, frictionless, and personal interactions across mobile, counter, curbside, and drive-through. When data from ordering, kitchen operations, labor, and supply chain flows together, operators gain real-time visibility to adjust staffing, prevent outages, and keep service predictable. Technology enhances every part of the operation, from decision-making to guest engagement, and creates experiences that feel consistent, intuitive, and personal. With stronger support from intelligent systems, employees have more time and clarity to deliver genuine hospitality, which remains the most difficult advantage for competitors to match.

> Technology that works well blends into the experience, and that is exactly the goal.

Operational Excellence Through Intelligent Automation

Technology strengthens the foundation of QSR operations by making kitchens safer, workflows more predictable, and throughput more reliable. Automation, sensors, and AI ensure consistency, reduce waste, and keep teams ahead of demand.

Customer Experience That Feels Personal and Effortless

For guests, technology shapes how every visit feels. It makes interactions faster, clearer, and more personal. Digital tools simplify choices, confirm accuracy, and create memorable moments that strengthen loyalty. When operations run smoothly behind the counter, staff can engage with warmth and attention, turning quick service into meaningful service.

70% *of QSR revenue flows through drive-thru*

(Source: The 2025 QSR® Drive-Thru Report, QSR Magazine)

- Energy aware HVAC and lighting systems
- Mobile ordering syncs within store systems
- Dynamic visual merchandising
- License plate or device recognition
- Voice AI ordering
- Menus personalize recommendations
- Voice AI ordering
- Vehicle flow analytics
- AI adjusts digital menu boards based on sales patterns, weather, and time of day
- Sensors and computer vision monitors
- Digital displays keeping families engaged during waits
- Automated cooking systems
- Predictive inventory tracking
- Self-service kiosks
- Autonomous floor cleaning with vision-based spill detection
- Smart POS systems

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Technologies that Drive Growth and Efficiency in Retail

Retail use cases work better when intelligence moves closer to the action with technologies that can think, decide, and respond in real time at the edge of the network.

Edge AI Computing: Intelligence Where Decisions Happen

Modern retail runs on data from cameras, sensors, and applications that sit in stores, warehouses, and restaurants. Moving all that data to the cloud introduces latency, risk, and cost. Edge computing changes the equation.

Power-efficient processing for AI at the edge

High-efficiency architecture & optimized Neural Processing Units (NPUs) support demanding AI workloads while staying within thermal and power budgets in compact devices. This allows computer vision, predictive analytics, and small language models to run directly on gateways, kiosks, POS terminals, and handhelds.

Multimodal AI on a single platform

Edge systems can combine video, audio, and transactional data to make smarter decisions & generate new content. A camera above a QSR counter can understand queue length, a sensor can track inventory, and the local processor can coordinate staff prompts or digital menu changes in real time.

Long lifecycle and consistent performance

Retail devices often stay in the field for many years. Edge platforms built for extended availability and industrial temperature support reduced redesign cycles, certification churn, and unplanned downtime.

The result is a layer of intelligence that supports every scenario in logistics, retail, and QSR without waiting for a response from distant infrastructure.

Connectivity That Retailers Can Trust

Every connected use case depends on reliable, secure links between devices, stores, and cloud services. As more AI moves to the edge, connectivity must do more than move data. It must keep experiences continuous even when conditions are not ideal.

Wi-Fi 6E and Wi-Fi 7 in store and restaurant environments

High density Wi-Fi handles many devices at once. This keeps cameras, tablets, kiosks, and POS systems responsive even during peak traffic. Lower latency and better spectrum use support real time applications such as computer vision and voice assistants.

5G and RedCap for mobility and backup

Cellular connectivity gives mobile and outdoor devices a primary link. It also provides an automatic backup if fixed lines fail. This is critical for roadside pickup, pop up locations, drive through lanes, and logistics fleets that must stay connected for payments and tracking.

Secure by design

Encryption, hardware level security, and modern authentication protect data in motion and at rest. This reduces exposure when devices operate in public spaces or across multiple partners and service providers.

With the right connectivity stack, retailers can scale pilots into thousands of sites while keeping service levels predictable.

Commercial Displays as the Intelligent Front Door

Screens are no longer static surfaces. They are the visible layer of a larger intelligent system that spans content, data, and operations.

Adaptive digital signage

Commercial grade displays can respond to time of day, inventory levels, and audience context. A screen in a grocery aisle can shift from brand storytelling in the morning to price focused offers in the evening when traffic changes.

Interactive touchpoints across the journey

Kiosks, digital menus, wayfinding, and self-service check in all depend on high quality displays with integrated computing and connectivity. When these endpoints run local AI, they can handle natural language queries, recommend products, and guide customers without overloading staff.

Operational command surfaces

The same display technologies support back of house functions. Kitchen status boards, logistics control towers, and store operation dashboards give teams a real time view of orders, tasks, and alerts.

Displays turn edge intelligence into visible action. They close the loop between data, decision, and customer or employee experience.
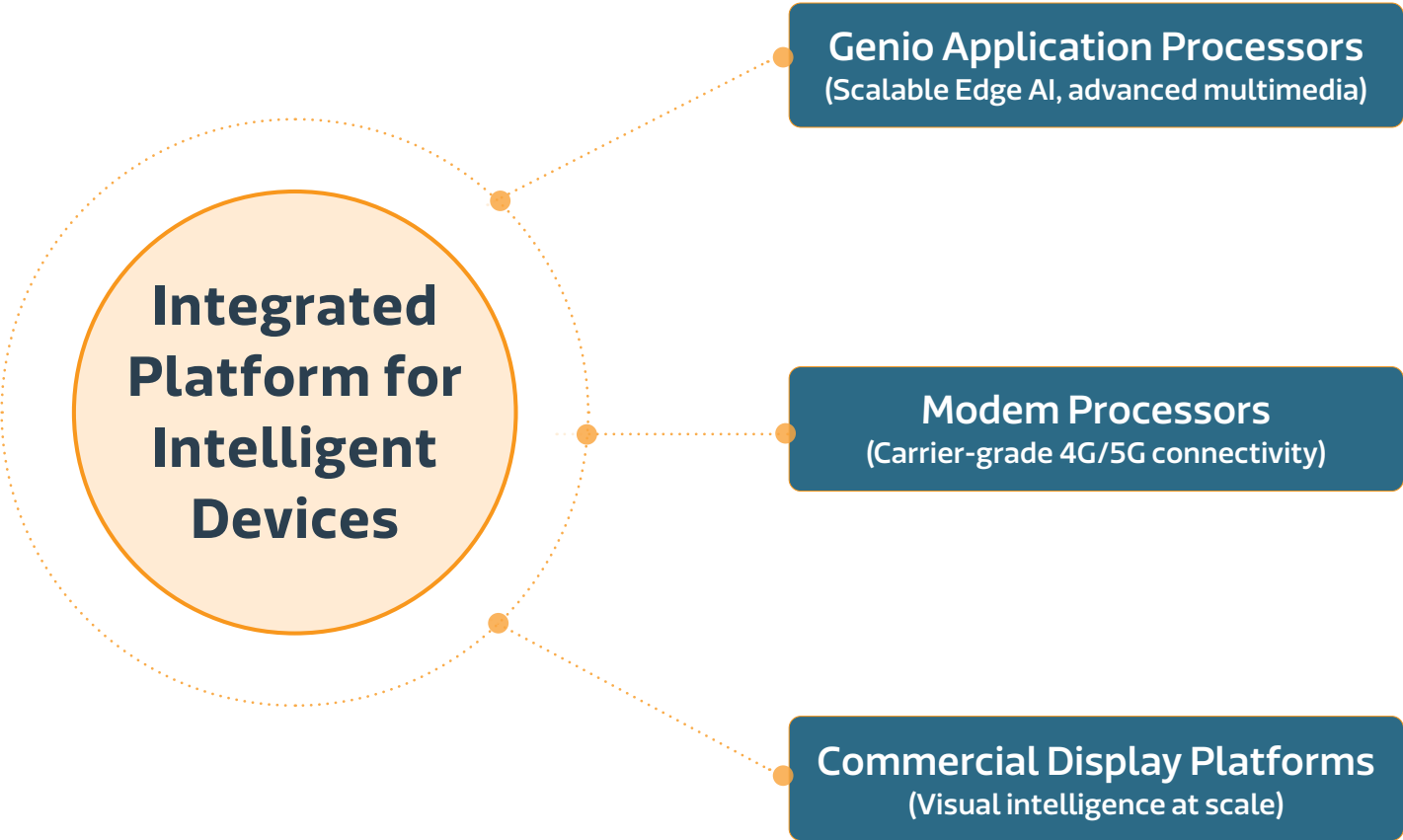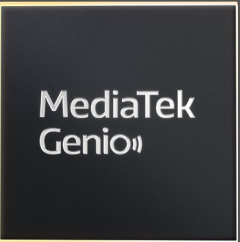
Edge AI, smart displays, and reliable connectivity turn in-store data into insight and real-time experiences customers notice and teams rely on.

MediaTek Technologies: Enabling Retail at the Edge

Compute, connectivity, and commercial displays on a single foundation

Integrated Platform for Intelligent Devices

Genio Application Processors
(Scalable Edge AI, advanced multimedia)

- AI performance up to 10 TOPS
- Heterogenous compute (combines CPUs, GPUs, and dedicated NPUs)
- Built-in hardware accelerators supporting verified AI models (MediaTek & NVIDIA TAO)
- Integrated ISPs, camera interfaces for computer vision and capture-driven applications
- Integrated advanced Wi-Fi and Bluetooth for high-speed, low-latency connectivity

Retail edge devices

Modem Processors
(Carrier-grade 4G/5G connectivity)

- Global carrier certified 4G/5G
- Sub 6 GHz support (for stable coverage and throughput)
- Robust security (secure boot, encrypted storage)
- Power optimized SoCs and modules (for extended battery life)

Secure retail edge devices with secure communications

Commercial Display Platforms
(Visual intelligence at scale)

- Integrated platforms for digital signage, video walls, & interactive displays
- AI upscaling with codec support (HEVC, VP9, and AV1)
- 4K display with high refresh rates
- AI based picture quality (auto-adjusts color, brightness, motion)
- AI voice (natural, hands-free interaction)

Retail interactive devices

Unified Software, Tools, & Developer Experience

Unified SDK and Maintained BSPs (Genio platforms)
Genio supports Android, Yocto Linux & Ubuntu; Modem-IoT supports Android

NVIDIA TAO Integration
faster AI model training, optimization & deployment

Genio Developer Center
one hub for SDKs, docs, reference designs & engineering support

10-Year Lifecycle Support
Power-efficient design, long-term BSP support, proven reliability

MediaTek Retail Success Stories

Edge intelligence redefining efficiency and experience across every touchpoint

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Enhancing Smart POS Performance with MediaTek

Xiangcheng Communication's P10 with MediaTek's MT8766 SoC

Challenges

- Network instability & multitasking lag
- Short battery life & affordability hurdles
- Need for reliable, real-time transactions across geographies

Solutions

- Integrated Wi-Fi, 4G, Bluetooth connectivity
- Efficient quad-core processing with sub-4W power usage
- 15% faster development, 20% longer battery life
- Strong market adoption across global markets

INSTORESCREEN™

Driving Smarter Retail Displays with MediaTek Genio 700

InstoreScreen's Micro Computer FlexBox

Challenges

- Evolving from basic screens into intelligent platforms
- Unified, reliable computing solution for AI-driven content & analytics
- Continuous operation across multiple display formats

Solutions

- Compact microcomputer for InFlex, InCap, and Poster displays
- Unifies compute, connectivity, and AI
- Octa-core processing for adaptive 4K intelligence
- Real-time insights & elevated customer satisfaction

ezurio

### Transforming Retail HMIs with MediaTek

Ezurio's Tungsten HMI with MediaTek's Genio 510

Challenges

- Withstanding heat, moisture, and frequent cleaning
- Legacy systems lacked graphics power, durability, and integration
- Required long lifecycles & easy certification

Solutions

- Six-core processing, advanced graphics, & AI acceleration
- Pre-certified, ready-to-deploy platform
- Cuts engineering time, reduces compliance risk
- Long-term reliability for next-gen retail equipment

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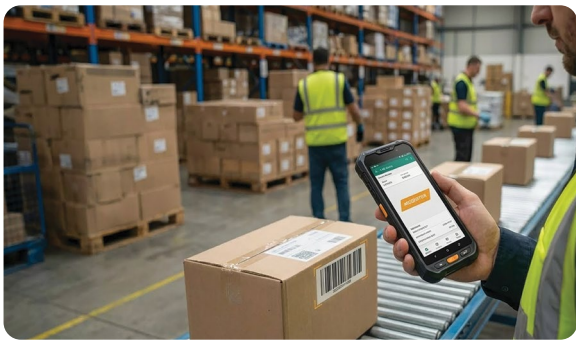
Enhancing Logistics Efficiency with MediaTek

Xiangcheng Communication's Smart Handheld T15 with MediaTek's MT8766 SoC

Challenges

- Real-time data capture & stable connectivity
- Long battery life for continuous operations & cost-efficiency
- Multitasking capabilities for barcode scanning, OCR, and communication, without lag

Solutions

- Octa-core processing, Wi-Fi 5, BT 5.1, and 4G Cat-7
- Integrated, power-efficient platform
- 20% longer battery life, 18% higher productivity
- 15% faster development, optimized for high-speed logistics

MediaTek Integrates NVIDIA TAO on the Genio® Platform

Pre-trained Models: Over 100 ready-to-use models for vision AI applications

Automated Tuning: Optimizes AI models for inference without requiring deep AI expertise

Efficient Deployment: Converts models into formats compatible with retail edge devices

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Ready to build what's next in edge retail?

Partner with MediaTek and bring your edge AI roadmap to life.
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