

SOLUTION BRIEF

AI for Edge Computing
Smart Store Management



ThunderSoft Enhances Customer Experience with Retail Customer Intelligence at the Edge

Opt-in customer recognition with VIP identification for connected customer experiences, optimized by Intel® Edge Insights for Retail



“ThunderSoft Smart Retail System is one of our key solutions for improving customer experience through AI technology. When opt-in customers enter the store, personnel see relevant information from their history. This allows us to provide more-accurate, relevant services based on customers' behavior and buying history. Customer insight technology is at the core of the Smart Retail System, enabling a high recognition success rate and adapting quickly to its environment.”

—Wenguang Wu, executive president,
ThunderSoft

With 80 percent of consumers more likely to purchase from a brand offering personalized experiences,¹ the race is on for retailers to understand customers better, in a shorter period of time. Using Internet of Things (IoT) devices, like connected cameras, can help retailers deliver the insights they need. Now ThunderSoft has developed an intelligent, digital smart store management system to help stores identify opt-in VIPs, track passenger flow, and understand anonymized customer segments.

The ThunderSoft Smart Retail System, developed with Intel® Edge Insights for Retail software and built on Intel® technology, enables smart customer analysis for retailers. Using a simple, user-friendly app, retailers can identify customer flow patterns, optimize staff allocation, and track consumer behavior for a more relevant, tailored customer experience.

Challenges: High-volume data transmission and diverse devices

Collecting and analyzing video footage from in-store cameras requires a high volume of data transmission. While the cloud offers access to highly scaled compute resources, upload bandwidth for the large data volume produced by many connected cameras is cost prohibitive. Customer insights at the edge can be faster—though without leveraging a similar amount of upload resources, it requires a high degree of customization and optimization to improve accuracy.

To create a viable platform for retailers to manage edge devices, ThunderSoft needed an open API standard that would allow integration of connected devices and third-party services. With many protocols and data formats in use by different retailers and devices, a comprehensive solution must adapt to the unique needs of each store and allow a broad range of devices to communicate seamlessly.

Solution: Accurate customer insights at the edge deliver relevant customer experiences

ThunderSoft puts visual data analysis at the heart of understanding customers. Using this optimized data can help store staff to customize a relevant retail experience on an individual level. The ThunderSoft Smart Retail System includes capabilities for full-angle detection and recognition to better enable the VIP experience in store.

With antibacklight capabilities, as well as support for low-light conditions, the ThunderSoft Smart Retail System can detect and analyze customers and flow patterns in a wide range of environments. With high-precision VIP identification and live antispoofing detection, masks and photographs can be differentiated from real faces, minimizing the potential for malicious or unauthorized activity.



**INTEL® EDGE
SOFTWARE HUB**
intel.com/edgesoftwarehub

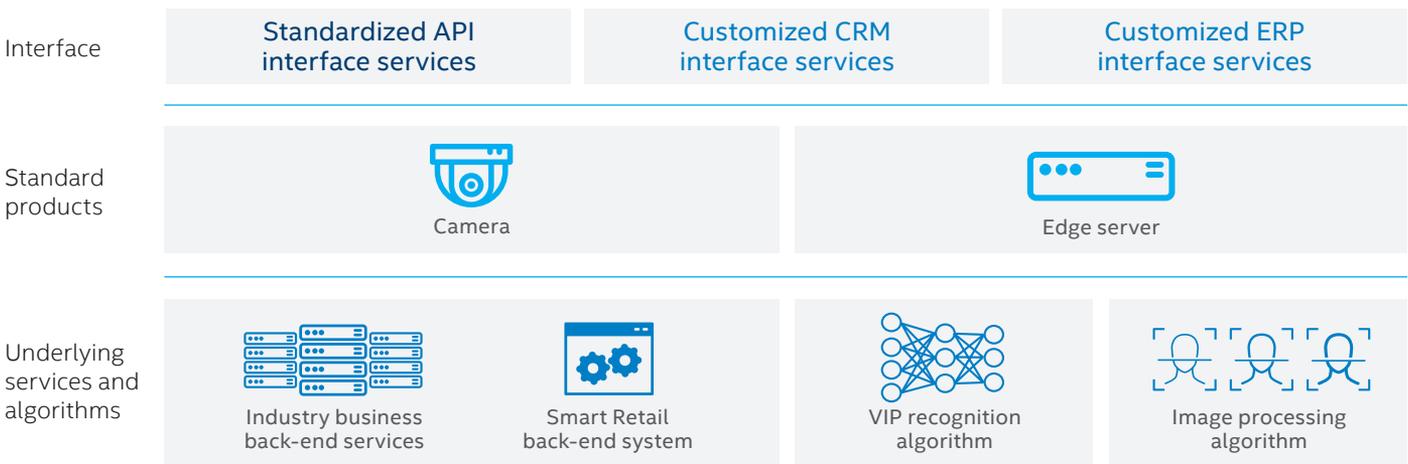
Using the Smart Retail System, retailers can get an accurate count of how many shoppers are detected in each part of the store. The VIP recognition capabilities of the system enable easy, secure customer tracking to understand how customers browsed and shopped during their visit. Emotions can also be analyzed, helping retailers see how customers respond to in-store displays and promotions.

Users interact with the Smart Retail System using either a desktop dashboard or a mobile app. The system can also be integrated with customer relationship management (CRM) software to report on customer behavior in real time and make predictions for improved sales performance.

Benefits of the ThunderSoft Smart Retail System include:

- **VIP identification:** Using opt-in customer insight databases, the Smart Retail System can rapidly alert staff to the presence of VIPs who have opted in to enable a more personal, curated experience.
- **Staff optimization:** Understanding traffic patterns and flow can help management better predict store visitor numbers and close rates for promoted products, enabling smarter decision-making.
- **Optimized store layout:** Detecting customer shopping routes can improve traffic flow throughout the retail environment, increasing time spent in store by consumers and overall sales volume.

Smart Retail System Architecture



How it works in brief

To develop the Smart Retail System, ThunderSoft had to maximize flexibility and connectivity to a large range of potential devices at the edge, including in-store cameras, thermal sensors, and burglar alarm systems. ThunderSoft accelerated development times by 60 to 70 percent² using Intel Edge Insights for Retail, a collection of edge software and tools validated and optimized by Intel for retail use cases.

Built with the Intel® Distribution of OpenVINO™ toolkit and EdgeX, both included in Intel Edge Insights for Retail, the ThunderSoft Smart Retail System uses EdgeX's REST API to enable communication between multiple microservices and devices.

ThunderSoft used the Intel Distribution of OpenVINO toolkit to improve image processing from video streams. Before optimizing VIP detection and recognition algorithms with the toolkit, each ThunderSoft device could process two video streams simultaneously. With new optimizations from the

Intel Distribution of OpenVINO toolkit, microservices from the device services layer—encompassing bridges to connect devices like alarm systems, heating sensors, and HVAC systems—can communicate with multiple types of sensors and devices. Data from IoT sensors can quickly be converted to a common EdgeX Foundry data structure, allowing the data to be delivered quickly to the core services layer.

Using the Intel Distribution of OpenVINO toolkit also enabled ThunderSoft to accelerate solution performance by tapping into built-in Intel® hardware acceleration resources that increase performance for CPU, GPU, VPU, and FPGA components. Deep learning algorithms can be performed faster, with heterogeneous processing and asynchronous execution to reduce the time spent waiting for system resources.

Conclusion: Deeper customer knowledge for more-effective retail management and decision-making

Understanding customers is critical for retailers today, and one path to competitive advantage is intelligently adapting retail experiences to specific customer needs. ThunderSoft created the Smart Retail System to simplify the creation of relevant, engaging retail experiences by connecting customer information, building devices, and store layout detection.

Using Intel's Edge Insights for Retail software package and the Intel Distribution of OpenVINO toolkit, ThunderSoft was able to accelerate development and improve performance for the Smart Retail System. The offerings simplified AI algorithm programming and accelerated hardware performance on a broad range of Intel products, enabling faster deployment and more-effective solutions.

Learn more

To discover how the ThunderSoft Smart Retail System can drive more-effective customer analytics in retail, visit ThunderSoft.com today.

About ThunderSoft

ThunderSoft is a provider of operating systems and other technology products and solutions, with a staff of experts in mobile, IoT, automotive, and enterprise technologies. Headquartered in Beijing and listed on the Shenzhen Stock Exchange, ThunderSoft has established strong partnerships with world-leading manufacturers of semiconductors, computer components, and terminal devices, as well as software companies, internet providers, and mobile carriers. These wide-ranging partners provide a unique ecosystem for creating high-quality intelligent devices. ThunderSoft has more than 30 R&D centers and offices in China, as well as a global presence in Germany, Finland, Bulgaria, Japan, South Korea, India, Malaysia, Singapore, Canada, and the United States.

ThunderSoft.com

“Smart retail is believed to be a fast-growing market with great momentum, where sophisticated and systematic technologies are integrated. Joining the Open Retail Initiative (ORI) and Intel® Edge Software Hub and working closely with Intel and other top technology companies, ThunderSoft, as a leading OS technology provider, is willing to take advantage of the ecosystem to enable more vertical solutions in retail as well as other emerging sectors.”

—Shuo Zhang, senior product manager, ThunderSoft

Intel® Edge Software Hub START YOUR INTELLIGENT EDGE SOLUTIONS HERE

The Intel® Edge Software Hub is a one-stop resource to simplify edge solution development and accelerate deployment. With robust software tools and deployment-ready software packages, the Intel Edge Software Hub provides prevalidated, pretested, and interoperable solution ingredients.

Reduce setup time and bring your edge solution vision to life with software optimized for Intel's expansive portfolio of hardware solutions. Each Insights package includes components designed to meet the specific needs of edge use cases:

- **Edge Insights for Retail** improves data accessibility to simplify development of relevant, highly engaging consumer experiences.
- **Edge Insights for Industrial** enables advanced AI workloads at the edge for video and time series data ingestion, analytics, and automation for machine vision solutions.
- **Edge Insights for Vision** accelerates innovation in computer vision applications and edge-to-cloud integration.

[Explore the Intel Edge Software Hub ›](#)



1. Source: <https://us.epsilon.com/pressroom/new-epsilon-research-indicates-80-of-consumers-are-more-likely-to-make-a-purchase-when-brands-offer-personalized-experiences>.

2. Source: Internal ThunderSoft testing.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

Intel® technologies may require enabled hardware, software, or service activation. No product or component can be absolutely secure. Your costs and results may vary.

Intel is committed to respecting human rights and avoiding complicity in human rights abuses. See Intel's [Global Human Rights Principles](#). Intel's products and software are intended only to be used in applications that do not cause or contribute to a violation of an internationally recognized human right.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.