

Intel and YalaTech Jointly Launch Edge AI-Box for Customer Insight Analysis of Digital Retail Store

“With years of efforts in the retail sector, YalaTech has obtained a deep understanding of retail scenarios and needs, and has launched a number of smart retail solutions. We are proud to team up with Intel this time, through which we provide key capabilities like whole-area customer traffic analysis using edge computing-based solutions to help users build smart stores, while gaining deeper insight into the retail scenarios. We look forward to continuing our cooperation to bring more outstanding solutions to the retail industry.”

– Ms. Weiqiao Li
CEO of YalaTech

Overview

Many retail service providers have realized that the video systems they have purchased can only meet simple needs including video capture, video playback, theft and damage prevention of products, while contributing hardly anything to business improvement; with the available video systems, it is difficult to analyze store traffic or understand consumers’ preferences through images, not to speak of optimizing shelf placement or product categories; the digitalization of retail stores is quite an expensive process, as the previously deployed cameras and other old devices no longer fit and new ones need to be purchased when the new systems come into use..... Retail stores today have been disturbed so badly by all of these problems, which also restrain the stores from shifting towards the smarter operation.

To help the retail stores address pain points in their smart transition process, Intel and YalaTech together launch an edge AI-Box solution for whole-area customer traffic analysis based on the Intel[®] architecture. The solution is compatible with and can leverage the cameras previously installed, performing AI inference and data analysis in the Box deployed on the edge, thus meeting the needs of customer traffic analysis, consumer products analysis, data-based decision-making, etc.

Challenge: how to turn the bulky cameras in retail stores into smart insights?

Smart retail is widely considered an important way, in a fiercely competitive market, to drive the transformation and growth of brick-and-mortar retail businesses and enhance the consumer experience. In July 2021, the General Office of the Ministry of Commerce issued the “Technical Guidelines for the Construction of Smart Stores (for Trial Implementation)” (hereinafter referred to as “the Guidelines”), to provide solutions for physical retailers to build smart stores.

The ability to collect, store and analyze video data is indispensable for the overall smart retail system. Computer vision, artificial intelligence (AI) and other relevant technologies can be integrated to segment, identify, and track targets like people, products and scenes in the videos collected in a specific zone, followed by real-time data analysis to generate corresponding insights. Smart video analysis is now widely applied in retail scenarios to analyze customer traffic, identify consumer products information, recognize scenes of products display, check products automatically, detect ground promotion businesses, put together shelves, etc. These applications help retail service providers enhance their in-store data insights and make business decisions more efficiently.

Retail service providers, if they wish to acquire the above-mentioned intelligent capabilities, need to reconstruct their in-store video system by purchasing and deploying new AI-empowered video solutions if they still follow the traditional model. But this model poses the following challenges:

- **Strong dependence on network bandwidth and stability:** most traditional AI video solutions upload the video data to the cloud data center for AI inference; however, this approach tends to trigger high costs for cloud service and wide bandwidth, and AI video analysis may not be able to continue once the network connection is interrupted or unstable.
- **Impossibility to flexibly scale algorithms:** traditional “camera + algorithm”-based AI video solutions often provide only one single function with a certain type of camera, and it is difficult to scale algorithms for more features; people have to buy a new AI camera when some new features are in need, making this a cumbersome task that brings additional procurement and operation costs.
- **Infeasibility to connect with other devices in store:** traditional AI video solutions are generally deployed separately rather than connected with any sound, lighting or electrical devices in the store, failing to meet the needs of intelligent control, energy saving or consumption reduction.

With the increasing need of theft and damage prevention as well as refined management, the camera has become a “must-have” for most retail stores. How to use the existing large number of cameras in the stock to solve the above-mentioned challenges? Is it possible

to reduce the cost if we make video collection and analysis two separate processes, and use the existing cameras for video capture only while analyzing the videos all on a separate, specific platform for processing?

To address these challenges, Intel works together with partners including YalaTech to optimize their highly flexible and scalable innovative solutions for retail scenarios by integrating retail hardware & software, APIs and sensors in a standardized way to help retailers improve data analytics and insights, thus making possible personalized in-store experience and science-based business decision-making.

YalaTech’s edge AI-Box for whole-area customer traffic analysis based on the Intel® architecture

YalaTech’s edge AI-Box for whole-area customer traffic analysis based on the Intel® architecture, built around the core of Intel Video AI Box, can be connected downward with cameras, sensors, or sound, lighting and electrical devices to gather and transmit the key data collected by these IoT terminals to the edge AI-Box for processing, and integrated upward with AI algorithms for customer traffic statistics, hot and cold zone map, products analysis, behavior analysis, etc. to meet the needs of a smart retail system for deployment and expansion.

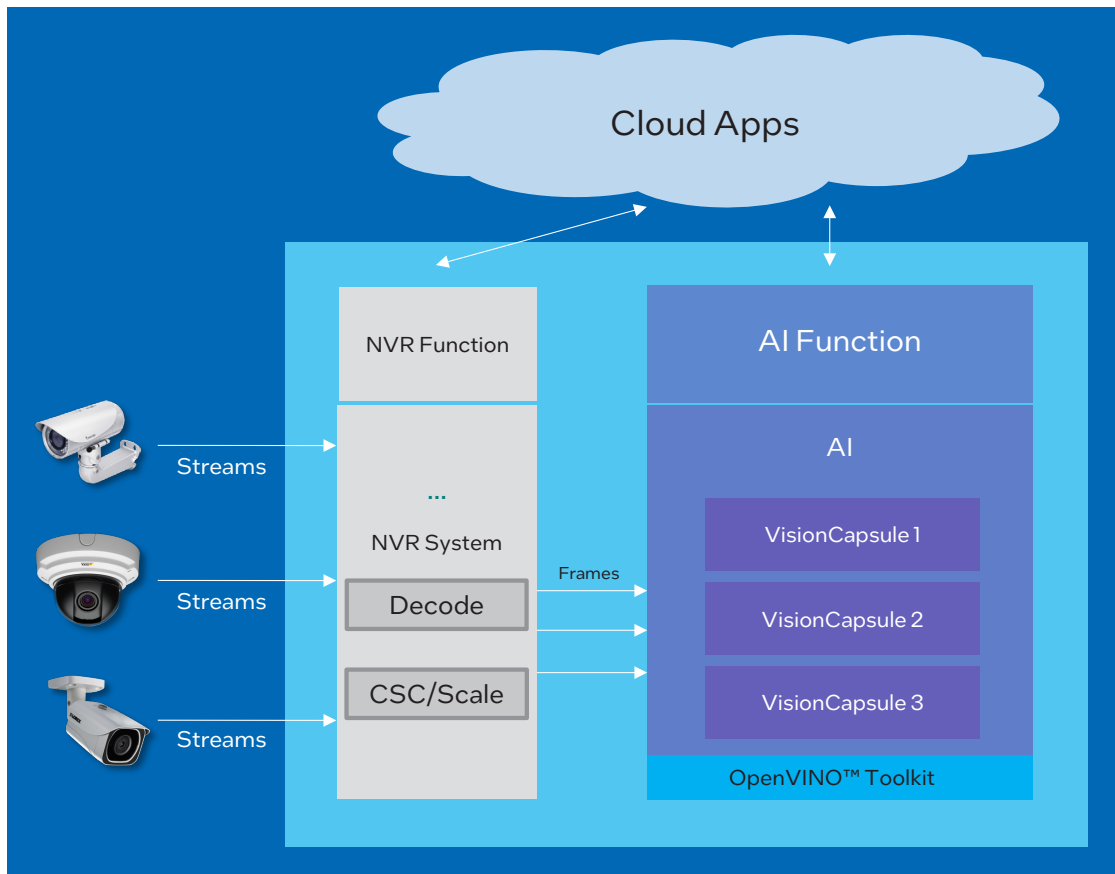


Figure: Architecture of YalaTech’s edge AI-Box for whole-area customer traffic analysis

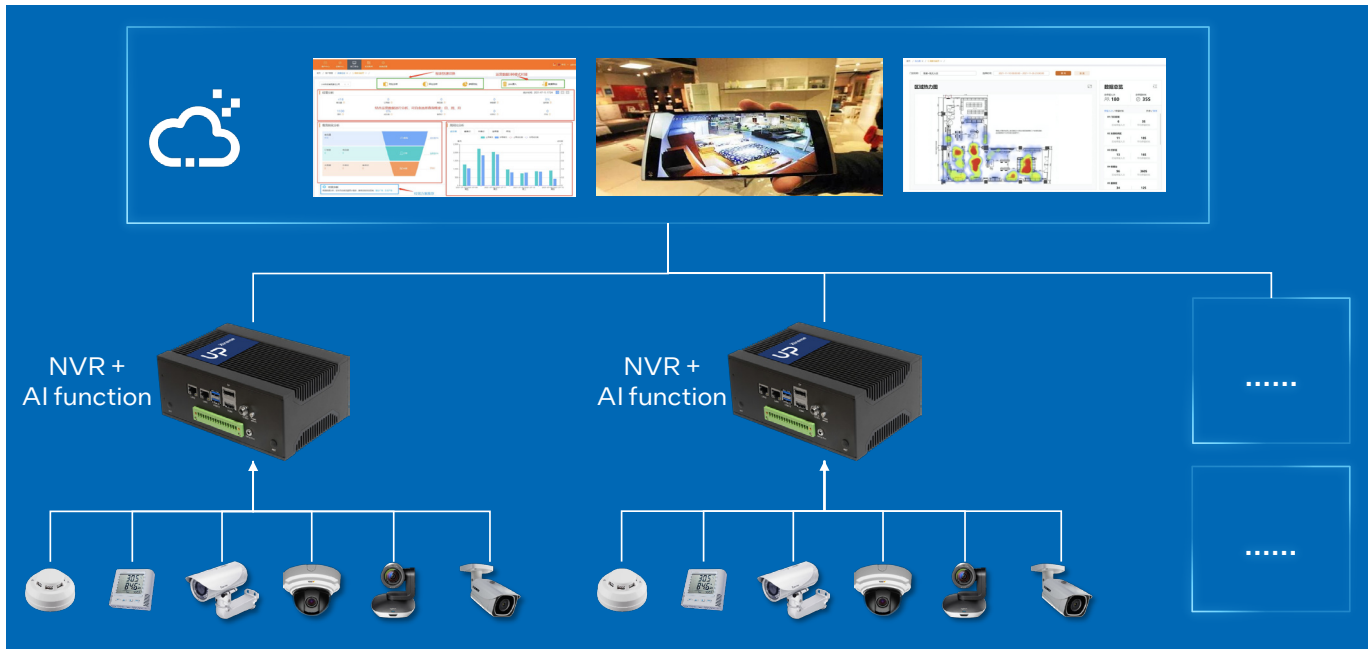


Figure: Connection structure of YalaTech's edge AI-Box for whole-area customer traffic analysis

The solution integrates YalaTech's video data-based applications such as customer traffic analysis, remote store inspection and whole-area hot zoning. YalaTech's application of whole-area customer traffic analysis, among all others, captures real-time data of customer traffic and customer attributes with cameras, and completes customer traffic measurement, customer attribute analysis, customer tracking, traffic flow analysis and heat analysis through bio-detection, identification, and tracking algorithms. It replaces the traditional manual statistical mode which used to be inefficient and highly distorted, making management decisions more science-based and reasonable.

This solution enables stores to collect, extract, analyze and upload data on the edge, and different color shades seen from the heat map displayed on YalaTech's "Mendianbao" APP can tell how popular the brands/products are in a certain zone in the store. Then the stores make some changes about the shopping mall/store layout and traffic flow planning and layout, optimize the selection and display of products based on the heat map, enhance the overall spatial layout in the store, as well as gather more attention to the products in the cold zones.

The solution is equipped with Intel Video AI Box that adopts the 11th Gen Intel® Core™ low-power mobile processor. The processor, featuring Intel's high-end manufacturing process and redesigned core architecture, is also equipped with the brand-new Intel® Iris® X^e Graphics and high-end built-in AI features for its excellent performance.

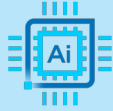
Intel delivers a complete software stack to accelerate the development of intelligent edge applications. At the bottom layer, the edge AI-Box offers an underlying library optimized for Intel hardware to boost performance, including Intel® Media SDK, OpenVINO™, algorithm libraries, libraries and programming interfaces with operator-level optimization. On top of that, the Box can also support different media frameworks such as G-streamer, FFMPEG, etc., while providing pipelines optimized based on video scenarios, such as IPC input, decoding/VPP, transcoding, RAID storage, video analysis, splicing/display and feature matching for easier use and integration. At the application layer, the Box provides examples for reference that are similar to real-world applications, enabling rapid prototyping and saving roll-out time.

YalaTech's edge AI-Box for whole-area customer traffic analysis based on the Intel® architecture boasts the following benefits:



Compatibility with and ability to use the cameras already installed in store

The solution is compatible with private protocols of a number of IP cameras (IPC), thus being able to utilize and frictionlessly upgrade over 95% of used IPCs and other devices as well as saving the cost of installing new IPCs, so that a low-cost digital upgrade is realized.



Supporting AI-based intelligent applications, such as whole-area customer traffic analysis

The solution obtains a large amount of data collected by IPCs and other devices, and conduct AI inference and data analysis in the Box deployed on the edge, so as to generate customer traffic statistics as well as the hot and cold zone map, and provide supply chain products analysis as a foundation for decision-making as well as some suggestions for products display.



Supporting efficient inference of multiple AI algorithms based on powerful performance

With the help of Intel® Core™ processors, Intel® HD Graphics and OpenVINO™ toolkit at the software level, the solution significantly improves the inference efficiency of AI algorithms and generates near-instant data insights.



High stability and security

The solution, supported by edge-based data processing and analysis, does not rely on cloud computing power, thus saving a lot of costs in cloud service and bandwidth, while avoiding problems caused by network interruptions or instabilities. The edge-based processing mode also reduces the security risks that may occur during data transmission and improves user's ability to control the data.



Supporting agile upgrade of algorithms with high scalability

The solution supports multiple AI algorithms and heat maps, and can upgrade and add new algorithms at any time, which can be loaded and used at any moment as long as the system is on.



Low TCO (total cost of ownership)

The solution can help retail stores have a full use of old IPCs and other devices without any need for new purchases, saving some procurement and deployment costs. Moreover, the solution is able to meet the ever-evolving needs for years to come with its platform through agile scaling of algorithms, thus avoiding repetitive investments.



Supporting unified control of IoT devices

The solution enables communication and centralized control of IoT devices of various brands and protocols, along with unified management of lights, electrical devices, air conditioners and sound systems, thus creating a comfortable shopping experience for customers to boost consumption, as well as saving energy and reducing operation costs through connected control and adjustment of temperature and lighting based on customer traffic data.

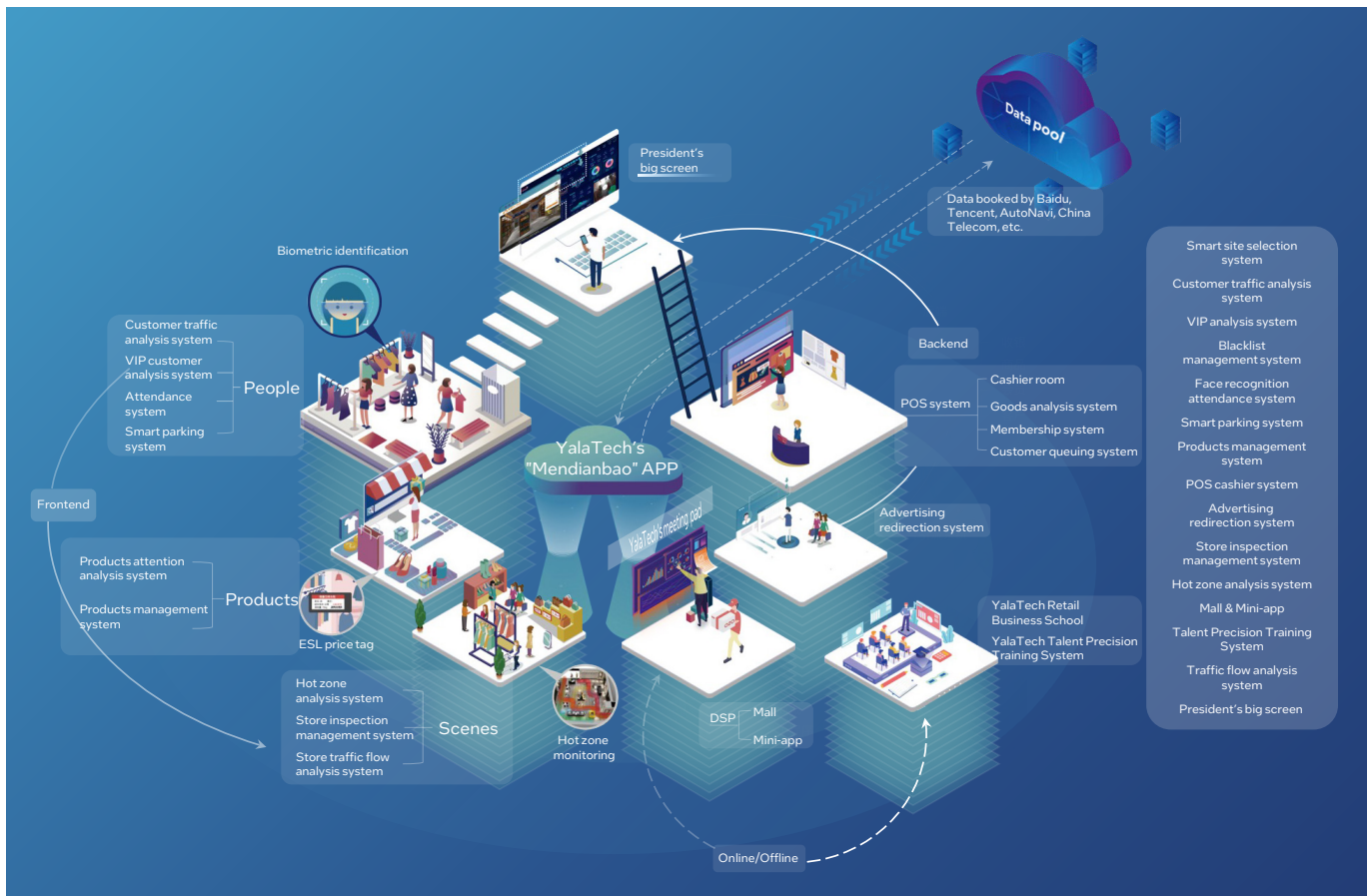
A big boost for retail stores' smart transformation in a low-cost and efficient way

At present, YalaTech's edge AI-Box for whole-area customer traffic analysis based on the Intel® architecture has been successfully applied in a number of scenarios, realizing the evolution from digitalized touchpoint and digitalized operation to intelligent decision-making, thus building a smart retail store.

For retail stores, the solution is of great value because it makes full use of old IPCs and other devices while leveraging technologies like AI and IoT to obtain high-value customers, optimize products display, and promote intelligent business decision-making, thus avoiding the shortcomings of traditional solutions in terms of cost, construction and deployment time, and scalability, as well as accelerating the transition towards smart stores.

“One of the benefits of the edge AI-Box is that it significantly reduces the cost of digital transformation and enables us to use our original infrastructure without having to specifically close the store for a while for deployment, And the customer traffic analysis can help us with refined operation and management, supporting well our business expansion and meeting our operational needs. We have made an internal estimate that our store sales, after smart transformation, could increase significantly and consumer satisfaction would be enhanced markedly as well. Therefore, we plan to launch the edge AI transformation program in more stores this year.”

– a retailer client



Outlook: Intel and YalaTech empower the building of smart stores comprehensively

YalaTech's edge AI-Box for whole-area customer traffic analysis based on the Intel® architecture can accelerate the implementation of intelligent edge applications. By continuously integrating 5G, AI and edge computing, the solution applies comprehensive product technologies in new smart retail scenarios while advancing innovation and ecosystem-building, so that the retail industry is empowered towards a more "digitalized and intelligent" future.

In addition to the edge computing-based whole-area customer traffic analysis, YalaTech will further cooperate

with Intel on optimizing the performance and algorithm integration of edge computing, so as to bring smart capabilities to more stores, helping with data integration of the three scenarios of people, products and scenes in the store, thus gradually forming an all-channel user operation mode and realizing more in-depth mining and operation of user value. The solution helps to build an enterprise-level digital and intelligent operation system, evolving from providing reference for marketing decision-making based on simple data analysis to accumulating user data assets based on marketing data.

About YalaTech

YalaTech, or YALABI, drives retail with data and makes business smarter. As China's No.1 brand in digitalizing retail stores and a global leader in providing comprehensive solutions for new infrastructure of digital business, YalaTech, with 14 years of retail innovation experience for upgrading core technologies, has won the title of "Most Valuable Brand for Technology Innovation of China's New Retail Service Industry", "China's Top 50 Consumer Technology Enterprises" and "Guangzhou's Top 20 High Growth Enterprises in the High-Tech Sector". YalaTech is dedicated to innovative R&D activities supported by new technologies like AI, Internet of Things and big data, and engages in a large number of smart industries, including chain stores, shopping malls, supermarkets, convenience stores, home life, 3C (computer, communication and consumer electronics), fashion, communication technology, tourist destinations, international airports, etc. Meanwhile, the company helps enterprises shift from a digital world of businesses to a digital & intelligent one where the retail operation system is also upgraded in a smart way.

About Intel

Intel (NASDAQ: INTC) is an industry leader that focuses on developing technologies that change the world, drive global progress, and enrich human lives. Driven by Moore's Law, Intel is dedicated to the continuous innovation of semiconductor design and manufacturing to provide customers with solutions to major challenges. By integrating intelligence with the cloud, network, edge, and various computing devices, Intel unlocks the potential of data and helps improve both business and society. For more information on Intel innovation, refer to our China News Center at newsroom.intel.com and our official website at intel.com.



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