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Winning Together: ASUS IoT & Irida Labs Have Engaged in a Strategic Collaboration to Provide an AIoT-based Smart Vending Solution

Vision & AI Solution in Controlled Vending in Hotels, Hospitals and More

Smart vending has become a big business, integrating advanced hardware and software solutions to improve the customer experience. These systems are prevalent in controlled places such as offices, hotels, and medical centers, where users can use a card to open the door of refrigerated units and select their snacks or drinks of choice before scanning a barcode for payment.

ASUS IoT has been working with a comprehensive European end-to-end provider of intelligent vending solutions, which provides hardware and software solutions and point-of-sale accounting, restocking, refrigeration and logistics. The company has built a successful business in recent years based on the enhanced shopping experience that its technology delivers.

However, its existing offering needed a refresh as design and operational limitations were causing several pain points. For example, the smart vending provider had AI capability built into its solution to help with stock check and checkout verification. But it needed a new provider of the computer vision system - used to detect what products the customer takes from the fridge - as the previous vendor had stopped supporting it. The existing solution also ran on consumer-type gaming hardware, which complicated maintenance as the products changed every few years.

The vending solution also lacked interactivity, meaning the stock-up process was overly manual, and users expressed that they had too many tasks to perform when selecting and buying their food and drink. The desired (and achievable) end-state would be to automate payment, so the checkout process no longer requires scanning a barcode.

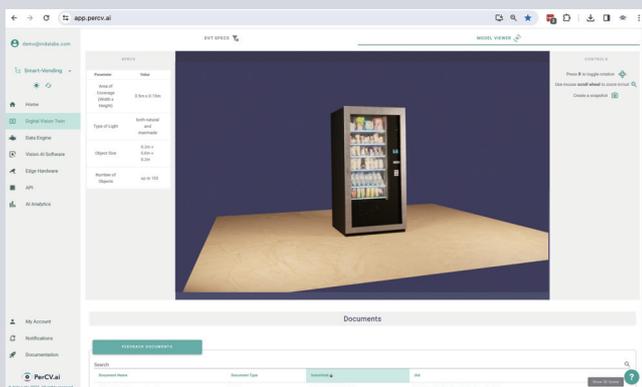## Developing an Innovative Vending Solution

The requirement was to develop a highly innovative smart vending solution to enhance the beverage and food shopping experience in controlled places, which would be offered to the market through a systems integrator and solution provider. ASUS IoT had the hardware for such a system, including high-spec PE1000N/PE1100N rugged industrial edge computers. These devices feature an intelligent Edge AI System with NVIDIA Jetson, a fan-less design and diverse I/O in a compact size. The computers also provide multiple connectivity options, a wide range of power inputs, and operating temperatures.

Still, it needed to partner with a company that could offer scalable AI vision-based technologies at the edge to create a system that could overcome the shortcomings of existing vending solutions.

impressed by its computer vision and AI solutions," says Silvia Kuo from ASUS IoT. "Irida Labs was already implementing such technologies in the supply chain and logistics sector, and it was clear that its technology held the potential for smart vending." We met Irida Labs at the Embedded World show and were impressed by its computer vision and AI solutions," says Silvia Kuo from ASUS IoT. "Irida Labs was already implementing such technologies in the supply chain and logistics sector, and it was clear that its technology held the potential for smart vending."

Established in 2009, Irida Labs' core product, PerCV.ai, is a vision AI platform supporting the building of scalable vision-based solutions at the edge. PerCV.ai is a complete software and services platform, providing an end-to-end vision AI infrastructure that combines all the necessary building blocks. These include a digital vision twin service with sensor, lens and positioning selection, a proprietary data engine that includes synthetic data building, and state-of-the-art Vision AI software paired with edge HW optimization and device management, with API-enabled access.

ASUS IoT partnered with Irida Labs to reimagine the vending solution and execute an upgrade, helping the end client transition to an industrial-grade PC and a more robust AI solution. The joint solution was developed to provide several service features. Users would download an App to access the store product list, grab the product off the shelf, and use the fully automated checkout service. The computer vision would automatically monitor what products were being selected, enabling the product fill level to be restocked accordingly. For the vendor, this granularity of information would significantly streamline logistics and on-site operations.

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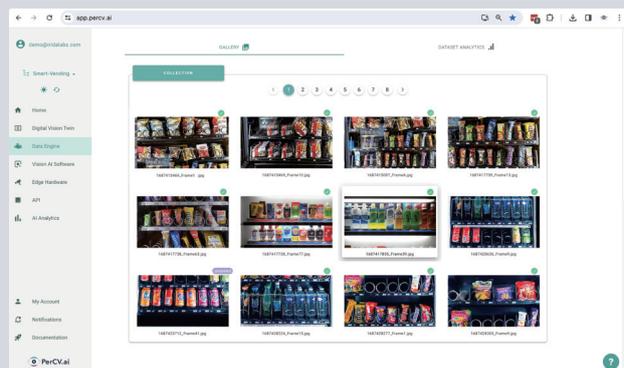
The Seamless Integration of Hardware & Software

ASUS IoT provided the PE1000N/PE1100N industrial-grade edge computers, with other AI-enabled devices and cameras supplied by another company from its partner ecosystem - ASUS AIoT
Partner Alliance Program. The computer offers uniformity across all deployment sites for the smart vending solution for activities such as POS calculations while having enough power to run AI models. The computers are also future-proofed, allowing for the addition of several GPUs for scalability options.

Meanwhile, PerCV.ai is offered as a vision-as-a-service software. Working together through a Co-Winning strategy, ASUS IoT and Irida Labs ensured seamless integration between the hardware and software elements of the solution, ensuring that all pain points were addressed to create a reliable data-driven solution. The collaboration maximised Irida Labs' Vision AI which relies on 80 percent of the same software and infrastructure regardless of the actual application – with a final 20 percent adjustment to the last mile. This approach meant a prototype system was developed relatively quickly in just a matter of months.

"Our expertise is in vision-based software that can run efficiently on devices at the edge, providing the entire SW pipeline needed to deliver real-world Vision AI solutions," says Demetris Anastassiou, head of product growth at Irida Labs. "But for successful deployment, we need to collaborate with partners that can provide the right hardware. ASUS IoT is a very well-respected name in the industry, and we have enjoyed an excellent collaboration on this project to date." He says the partnership has excelled because it has been based on mutual trust and respect. "ASUS IoT is a much bigger company than us, but it has been supportive and responsive throughout."

Endless Opportunities Across Sectors

The smart vending solution will soon be deployed for the first time, illustrating the ever-evolving trend of automation in the retail environment.

Meanwhile, ASUS IoT and Irida Labs are exploring opportunities for AI-based vision systems in other applications, such as manufacturing, warehousing and logistics. In each case, ASUS IoT will deliver advanced hardware design and software development capabilities and industrial-grade PC platforms with longevity. Meanwhile, Irida Labs will concentrate on its core competence, consisting on further inhancing its end-to-end Vision AI platform that supports building scalable vision-based solutions at the edge, providing AIoT-optimised embedded vision software using computer vision and deep learning and leveraging its extensive experience in helping companies develop scalable vision-based solutions.

"There are so many possibilities for our partnership based on the co-winning strategy," says Demetris Anastassiou. "Here, we have a vision-based system applied in a retail environment. But behind that, warehouses and logistics require asset tracking, inventory management, stock level control and even the coordination of autonomous guided vehicles. Together with ASUS IoT, we can bring vision-based solutions to the mass market."

ASUS IoT shares this positive sentiment. "Our Co-Winning strategy is dependent on finding partners that are innovative, resourceful and hungry for success," says Silvia Kuo. "Irida Labs met all those criteria. Indeed, this is one co-winning relationship that is sure to be continued."

> *"Our mission is to bring computer vision-based solutions to the mass market. ASUS IoT is a very well-respected name, and they have consistently created reliable and best-in-class hardware for AI computing, so we chose them as our preferred hardware partner for all our deployments."*
>
> **- Demetris Anastassiou,** Head of Product Growth, Irida Labs

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