# My WISE-PaaS

An Advantech Magazine - iCity Services 2020

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# Building Ubiquitous AIoT Spaces for intelligent Cities

## Leveraging AIoT transformation to enable intelligence




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# Advantech's UTC-515

## Increasing Operation Efficiency and Service with Kitchen Display System Using

ADVANTECH

*Enabling an Intelligent Planet*

In a quick service restaurant, the ability to offer a quick service and accurate orders is critical for delivering better quality and services to customers. Thus, equipment stability is one of the important factors for store owners to maintain the quality in the operation process. A well-known QSR brand has employed Advantech 's UTC-515 all-in-one touch computer with customization of the appearance and functionality to fit the kitchen environment. UTC-515 not only provides the kitchen staff comfy operation, but also optimizes the whole ordering process for better customers' experiences.

Non-grooving frame design with sealing off front panel, rear cover, and IO cover to avoid oil stick

Apply AS coating on the front panel for being oil-resistant and prolonged life cycle

HDD door design for easy maintenance


180-degree rotatable bracket arm provides a flexible working angle for a user-friendly purpose

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# Building Ubiquitous Smart Spaces for Cities

In order to ensure people's quality of life as the global population continues to grow and urban space becomes even more crowded, a clear trend has emerged to leverage technologies such as IoT, big data, cloud computing, and artificial intelligence to build smarter living environments. A wide range of IoT applications—ranging from smart museum exhibitions and smart digital signage displays at train stations and airports to interactive self-ordering kiosks in restaurants—are thus growing increasingly popular around the world.

To give readers insight into diverse urban IoT applications and successful implementation stories, this issue of My WISE-PaaS focuses on the theme "iCity Service," exploring the use of smart urban applications in areas including retail, hospitality, F&B and public space based on trend observations and case studies, as well as examining this topic from the perspectives of technology platforms and the concept of co-creation.

In this magazine's Advantech View column, Senior Manager Wesley Liu points out that in response to the latest industry trends, Advantech has divided IoT services into three categories: iRetail, iHealthcare, and iCity Services (iCS). This strategy has helped enhance Advantech's ability to supply both software and hardware to meet demand for smart services within various industries.

Furthermore, seven insightful articles analyze smart applications that contribute to urban sustainability. One of these articles highlights the company Ezcon, which integrated various equipment to create truly smart offices. Another looks at Advantech's intelligent queue management system, which proved to be of tremendous assistance to a well-known restaurant in Taipei. Meanwhile, the cashierless solution developed by Neurolabs improved the dining experience in cafeterias and canteens, while Ganso Food adopted Advantech's UPOS-211 POS system to bolster in-store service efficiency and inventory management. And the company PayinTech joined hands with Advantech to develop a mobile POS solution for cashless payment services. These stories put a spotlight on the diversity and innovation of smart applications across a host of industries.

To discuss the latest technological trends in e-paper and related applications in urban public spaces, Dr. Paul Apen, Chief Strategy Officer of E Ink Corporation, was interviewed for this issue. He shares his views on the collaboration between Advantech and E Ink in smart office, transportation and healthcare, as well as their future plans to co-create more smart applications.

From these diverse applications, case studies, and expert views, we see that people are the main focus of smart applications and services in urban spaces. Likewise, Advantech's WISE-PaaS platform and endeavors in the iCS sector are people-centric, dedicated to creating innovative applications and services that meet the needs of urban residents and making their living environments more convenient and beautiful.■

# Advantech is Redefining Smart Services by Developing iCS to Focus on Industrial Demands

**Images provided by Advantech**
**Interview with Wesley Liu, Senior Manager of Service-IoT iCS sector, Advantech**

In response to the latest industry trends, Advantech Service IoT Group plans to build three IoT Solution Business Units: iLogistics, iHealthcare, and iCity Services (iCS). This has enhanced its capability of supplying both software and hardware in order to meet the demand for smart services within various industries.

Not only has the popularization and maturation of IoT technology ignited Industry 4.0 within the manufacturing industry, it has also created new operating models within the service industry. More and more self-service kiosks have begun appearing in retail shops, restaurants, public open spaces, airports, train stations, and hotels, allowing customers to place food orders, shop, and search for information without requiring assistance from an employee.

Taking the fast food industry in Taiwan as an example, fast food restaurants such as KFC and MOS Burger have set up vast numbers of self-service kiosks within the past two years. These kiosks allow customers to order, pay, and then retrieve their meals from a counter. In addition, conveyor belt sushi restaurants such as Sushiro and Kura Sushi have placed tablets on tables so that customers can order directly as well as take sushi plates off the conveyer belt.

As for the European and North American regions, the food service industry has long been using self-service kiosks because of the high cost of labor. Recently, the hospitality industry also has embraced the rising trend of self-service kiosks. For example, hotels have implemented self-service kiosks in their lobbies to allow customers to check in or out on their own while casinos have turned all-in-one touch screen computers into self-service lottery vending machines. Customers simply tap the screen to

buy and print a lottery ticket. They can further use the vending machine to scan the lottery ticket's barcode to check if they have winning numbers.

According to Wesley Liu, Senior Manager of Advantech Service-IoT iCS sector , a trend besides self-services is the use of AIoT (a combination between artificial intelligence and IoT) to improve store operational and management efficiency. The implementation of wireless sensors in stores to collect on-site data, which is then uploaded to the cloud for 24-hour monitoring, provides one such example. In the event of an anomaly, administrators are quickly notified, and in the future, artificial intelligence will be able to make judgments and give direct orders to on-site equipment.

**Using industry demands as a blueprint for developing I.App**

To adapt to development trends within various industries, Advantech has redefined Service IoT Solution BU into three categories: iRetail, iHealthcare, and iCS. Originally, the catering, hotel, and entertainment industries all fell under retail, but incorporating them into the scope of iCS has allowed the retail division to focus on further enhancing their capability of supplying software and meeting the demands of various industries for smart services.

As Wesley Liu has stated, Advantech currently provides two types of software, with one developed internally to add value to hardware. For example, the remote management platform DeviceOn is available for Windows/Linux devices whereas Android-DM is available for Android devices. These software platforms allow engineers to remotely monitor, update, manage, or maintain equipment from a company's headquarters without having to physically interact with the equipment.

The second type of software is the Industrial App (I.App), which is similar to a smartphone app that customers can download. Currently, Advantech has a blueprint for meeting industry demands, starting with the identification of app types that are required by various industries. The next steps are to look for suitable external software partners around the world to address shortcomings, turn partners' software solutions into I.App through joint ventures and mergers, and then upload the software to Advantech's WISE-PaaS Marketplace.

Advantech's WISE-PaaS Marketplace is similar to Google Play in that it brings together various applications with different functions into a single online store. The current version 2.0 of the WISE-PaaS Marketplace is divided into four categories: Domain Focused, Industry, Common, and Edge SRP. The latter two are basic functions prevalent within all industries while the former two are more focused on industry demand and are convenient for customers to choose according to their own industry.

**Commitment to continue improving hardware specifications and features**

Hardware is Advantech's strength, and Advantech will remain focused on providing self-service equipment, mainframes, and wireless sensors as well as increasing R&D of Android products.

Advantech's self-service equipment consists mainly of three models: all-in-one computers, kiosks, and tablets. According to user needs, Advantech continues to develop different specifications and features. For example, a centralized charging base allows companies to simultaneously charge all of their industrial tablet computers as an alternative to the traditional method of using a dedicated plug to charge each tablet. This is far more aesthetically pleasing while also providing a more stable power supply.

With the Box PC, Advantech has developed a fully integrated mainframe. The VDD framework, proposed by Intel and based on the concept of edge computing, can meet rising demand for IT applications in stores. Wesley Liu explains that in the past, POS systems or larger desktop computers were often the only computer equipment in stores. Nowadays, with the increasing number of IT applications such as VIP face recognition, digital signage, and image recognition in stores, the unified deployment of hardware resources through an integrated mainframe is not only cheaper but also easier to manage.

In summary, IoT technology has reached maturity. To meet the demands of various industries and ultimately create a better living environment for people, Advantech's iCS will focus more on providing innovative software and hardware technological solutions as well as promote the implementation of smart applications in more sectors.■

# E-Paper Branching Out into New Industrial Applications

**Images provided by E Ink**
**Interview with Dr. Paul Apen, Chief Strategy Officer, E Ink**

E-Paper is most famous for its use within eReaders, but recent technological advancements have enabled its application within digital signage, electronic shelf labels (ESLs), and other emerging technologies.

Nowadays, it is common to see solar-powered ePaper screens showing passenger information at bus stops, ePaper bedside cards displaying patient health information at hospitals, and Electronic Shelf Lables (ESLs) informing customers of price updates and inventory status at popular retailers. This innovative implementation has completely revolutionized how people view ePaper, ushering in a new era where ePaper applications are everywhere and driving continuous growth within the ePaper display (EPD) market.

According to a Market Study Report, the EPD global market will expand from US$620 million in 2019 to US$1.11 billion in 2024 and increase at a compound annual growth rate of 10.2%. The main drivers of this growth are technological breakthroughs that are facilitating more diverse applications.

### EPD advantages include low power consumption and comfortable reading environments

According to Dr. Paul Apen, Chief Strategy Officer at E Ink, EPD technology has been developing for over 20 years now, with the result being a standard black-and-white EPD that features bistability (i.e. low power consumption), a reflective display that allows for reading outdoors in direct sunlight, a wide viewing angle, and rugged hardware. Furthermore, rapid


advancements in technology will bring about new color EPDs with more features and design features within the next three to five years.

Along with providing these advantages, EPDs are also perfect for installing in areas not connected to the electrical grid. Dr. Apen points to smart bus stops as an example. An EPD installed at a bus or train stop does not need access to the electrical grid. A solar panel supplies all the power it needs. Moreover, its rugged and weatherproof device design make it suitable for outdoor usage. EPDs as conference room signs can also be installed easily on an office or conference room wall with the assistance of magnets the conference room sign can be operated for months without recharging the battery. EPDs are thus easy and quick to install, significantly popularizing this market.

In addition, it is far more comfortable to read on an EPD than on an LCD. Dr. Apen explains that an LCD uses a backlight to project images into the user's eyes while an EPD reflects the ambient light from the environment such as room lights or the sunlight to illuminate images on the display. Thus readers enjoy a more comfortable viewing experience, especially during long reading sessions.

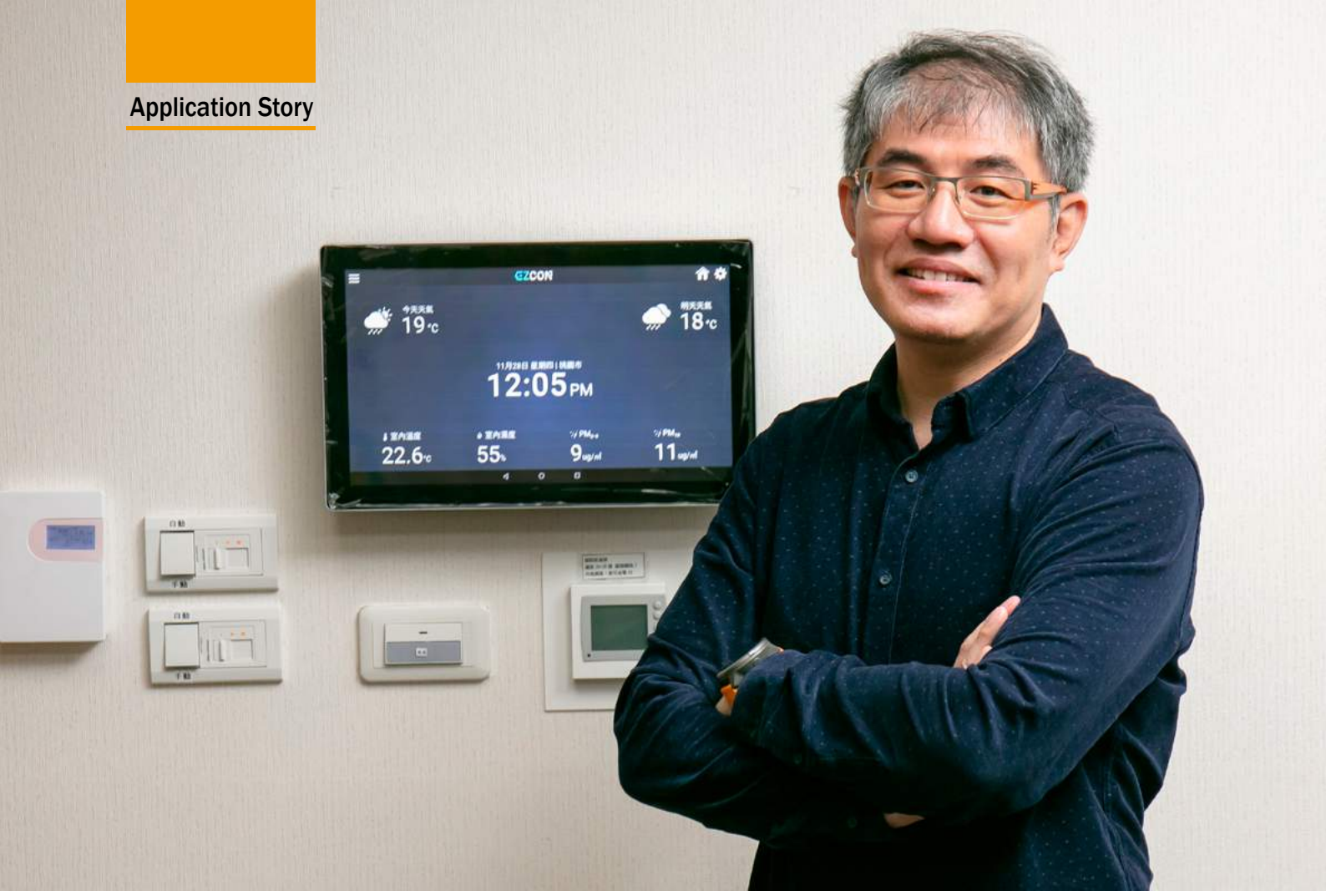
### The diversification of ePaper applications

These advantages have fueled demand for EPDs within the consumer device market, particularly in the eNote field that specializes in handwriting input features, as well as their application in various industrial sectors. Dr. Apen is confident that beyond its expansion into the smart retail and smart transportation industry, ePaper will also develop within the healthcare industries.

Within the retail industry, ESL and digital signage displays used for advertisement have rapidly gained in popularity. Taking ESLs for instance, product prices are synced in real time with the store's POS system, therefore providing store owners with the flexibility to introduce promotions, reduce product prices before an expiration date is reached, and other functions. ESLs can also be integrated within the back-end data analysis system along with digital advertising signage to reach their full potential and efficiency. Store owners can employ ESLs to save on cost and resources used in replacing price tags. In turn, these resources can be diverted into performing value-added tasks for retailers. For these reasons, ESLs have become increasingly popular in various countries within Europe and America.

Within the healthcare industry, ePaper has two main applications: first, an ePaper display can be used as a blood glucose meter, a feature available on the market for years now; second, it can be applied as bedside cards and ward cards, a use which has recently been implemented within hospitals. An ePaper bedside card can be connected to the hospital information system in order to provide patient medical information to hospital staff and caretakers. Currently, several hospitals have begun using ePaper this way within Taiwan, and hospitals in the U.S. are soon to follow.

From its use in eReaders within the consumer market to dynamic applications in retail, healthcare, and various others industries, ePaper has evolved into a highly sought-after technology. In the face of fierce competition, especially within ESL applications, E Ink will collaborate closely with partners to pursue development of rugged, multicolor, low power consuming ESLs. Additionally, E Ink will continue to provide value-added products and services, build comprehensive solutions for customers, and explore the limitless possibilities of ePaper.■






# Ezcon Integrates Various Equipment to Create Truly Smart Offices

**Images provided by Advantech**
**Interviw with Benny Chou, CEO, Easy Control Technology**

Based on high levels of system integration, Easy Control Technology (Ezcon) has teamed up with Advantech to create a comprehensively smart office for a construction company in Taoyuan, Taiwan. They also plan to apply similar solutions in the smart home market, so that more people can experience smart living and working environments.

Smart homes and offices have emerged as a new trend. To achieve truly smart environments, advanced integration capabilities are necessary. Benny Chou, CEO of Easy Control Technology, explained that “truly smart spaces allow people to switch off all equipment with a single click when leaving. Spaces that only integrate applications in a single interface, or require users to switch off equipment one by one, cannot be called smart.” Integration is thus key for creating smart offices and homes.

## Building a smart office

A prominent construction company in Taoyuan has been committed to revolutionizing concepts of the home in order to provide people with better living environments. The company sought the help of Ezcon

with the purpose of creating truly smart homes. The CEO of the construction company said that "we've been talking about smart homes for a long time, but companies have mostly approached this topic individually. If systems cannot be integrated, it is very hard to create truly smart homes." The company allowed its own office to be used as a testing ground, bringing in Ezcon to build a smart space that takes into account all relevant aspects.

In addition to integrated lighting, videoconferencing systems, and systems to monitor temperature, humidity and air quality levels, the office also boasts various smart applications. For example, when outdoor illuminance reaches 20,000 lux, the electrical curtains will be activated to prevent too much sunlight from coming in. Also, facial recognition systems have replaced fingerprint systems. People's faces are automatically screened when they enter and leave the office.

The smart control of the air-conditioning systems is coupled to water chiller machines. Benny Chou said that after these machines are activated at 8 a.m., the air-conditioning system will only be activated on a certain floor once the first employee has clocked in for work and thereby switched off the alarm system, and once the indoor temperature exceeds 20 degrees Celsius. The operation of air-conditioning and fan functions is entirely based on temperature, eliminating the need for human intervention.

### Working with Advantech to co-create the optimal solution

Since its establishment 14 years ago, Ezcon has focused on automated environment control for smart buildings, integrating lighting, air-conditioning, surveillance and door security functions in smart control boxes. Nevertheless, to create the comprehensive smart office, Ezcon required even more system development technology and integration capabilities.

In 2018, Ezcon developed a cloud-based software management platform, achieving a central management system that could integrate control applications for all sorts of equipment. Ezcon has also actively collaborated with various partners. For example, it has consolidated communication protocols with major home and electrical appliance manufacturers, which includes Hitachi air-conditioning systems, Honeywell floor-heating systems, and Schneider Electric smart electric boxes.

More importantly, as the main computer that connects all the equipment in the entire smart office solution, Ezcon selected Advantech's high-end ARK-3520 to optimize the solution.

### Advantech provides software development resources

Benny Chou said that after evaluating available industrial computers, Ezcon ended up selecting the ARK, because it's fan-less and noise-reduction features were able to meet demand for quiet living and working environments. In addition to the hardware, Advantech also provided tremendous support for the Linux-based software platform, helping Ezcon overcome various challenges.

After successfully completing the smart office for the company, Ezcon was praised for its hardware/software integration capabilities, as well as the ease of using the software interface. In the future, Ezcon will also use this solution in the smart home sector, including new projects being undertaken by the construction company. The CEO of the construction company expressed his belief that smart home concepts are not just for the high-end housing market, and it will also be adopted in smaller homes, making them accessible to a greater group of people.

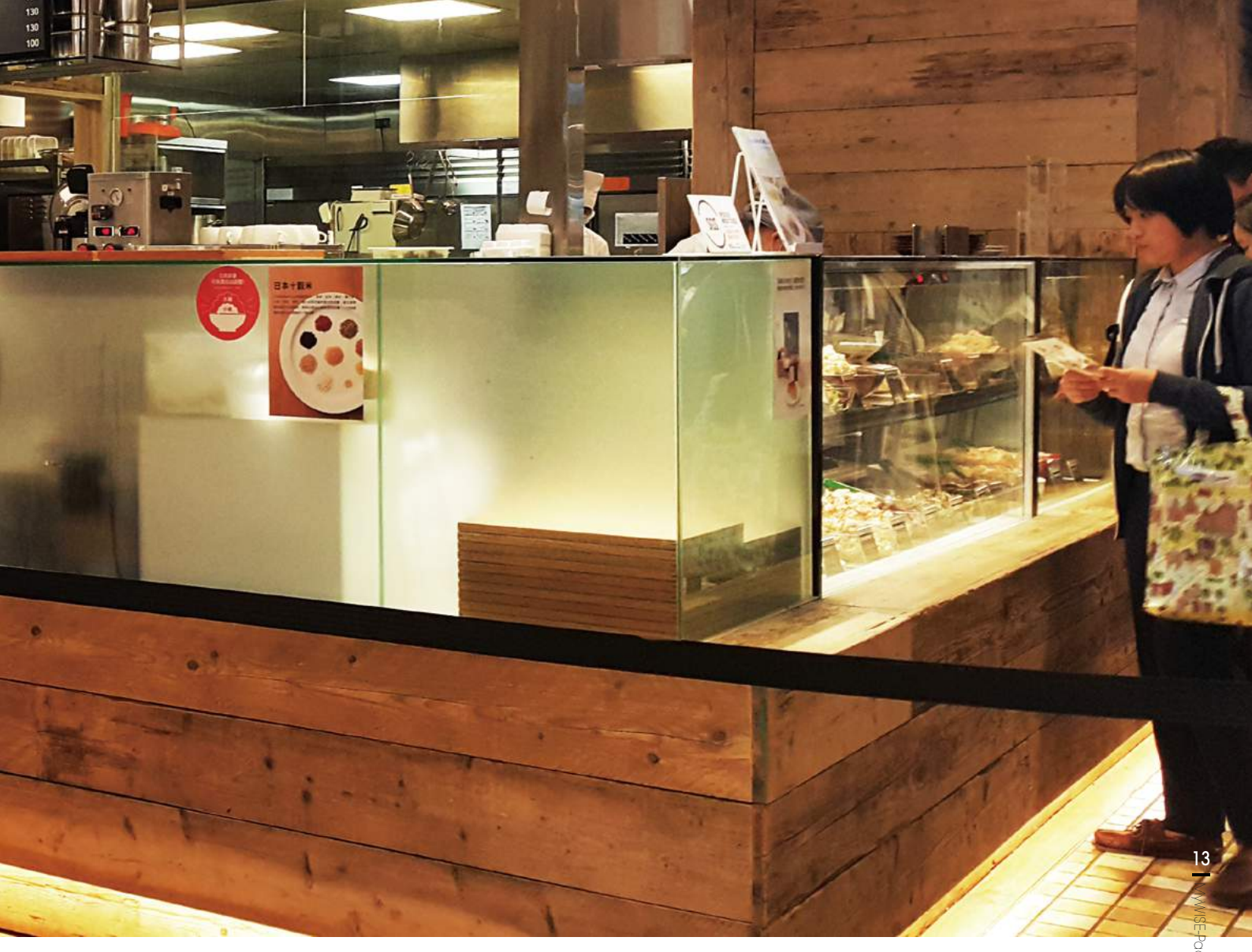
Looking ahead, Ezcon intends to further deepen its partnership with Advantech. In particular, they're looking forward to the market launch of the small-size, foldable touchscreen that Advantech is currently developing. Once communities and buildings have adopted smart management, related frameworks can be further upgraded with Advantech WISE-PaaS private clouds to consolidate control and management functions. Through co-creation by Ezcon and Advantech, even more smart applications can be developed, enabling even more people to live and work in smart environments.■




# Advantech's Intelligent Queue Management System Enhances Operations of Popular Restaurants

**Images provided by Advantech**

In addition to delivering excellent food, successful restaurants must also provide prompt and high-quality services to retain customer loyalty. One thing that has never changed for customers despite technological advancements— waiting lines. IoT technology can assist restaurant owners in managing and operating their business. Advantech's intelligent queue management system has revolutionized the queuing process and helped owners improve efficiency and reduce customers' waiting time.





Many businesses are gradually embracing IoT. The retail and hospitality sectors are among the most competitive sectors for IoT in the consumer market. Innovative solutions such as intelligent POS, customer survey, intelligent queue management, interactive multimedia broadcast, e-menu, self-ordering, and intelligent kitchen display systems are essential in bolstering the digital transformation of restaurants. A famous Japanese restaurant in Taipei implemented Advantech's intelligent queue management system. A complete solution of software and hardware, to improve its operations and services and increase its competitiveness in the market.

**Famous Japanese brand embraces intelligent queue management system**

Following its establishment in 1980, the Japanese brand first focused on the retail business, offering a wide range of quality products, including household items, apparel, and food. Its goal was to thoroughly rationalize business processes with an eye toward creating simple, low-cost, quality products.

In 2014, the brand opened its first restaurant in the Uni-Hankyu Shopping Mall in Taipei, Taiwan, which immediately made a big splash. Always interested in new dining experiences, local residentswere waiting in long lines at the entrance ofthe restaurant to sample its offerings. This was blocking the flow of people in the shopping mall. To resolve this issue, the restaurant urgently needed a solution that could help enhance operational management and digital transformation. Therefore, it implemented Advantech's intelligent queue management system, which solved the queuing issue and helped maintain the restaurant's competitive edge.

Advantech's intelligent queue management system delivered four key features to help with the restaurant's queuing management: simplification of customer queuing process, real-time queue status display, automatic queue notification and queue status checking, as well as, store queuing data analysis.

To simplify the customer queuing process, Advantech's queue management software was used in

combination with the UTC-520 series terminal, which served as a customer self-service queue terminal in the restaurant's reception area. The screen of the UTC-520 terminal shows the many groups of customers waiting in line for dining in and take-out. Customers can simply touch the screen to choose whether they want to dine in or order take-out. When customers choose to dine in, they are asked to indicate if they are willing to sit separately and if they need a special chair for children. Lastly, the customers are asked if they want to leave their cell phone number to receive SMS notifications of the queuing status. After all the questions are answered, a printer connected to the UTC will print out a queue ticket with a queuing number for the customers. With such a queue ticket, customers don't have to wait and queue at the restaurant; instead, they can continue with their shopping in the mall, and return once they receive a call from the restaurant indicating their seats are ready.

To monitor customer's information, a 42" LCD display that shows real-time queuing status was installed in the restaurant's reception area close to the UTC. Customers can check the queue number called and the number of groups waiting on the LCD screen. When tables become available, the staff can call in the next group in line with a handheld tablet.

If the customers have inputted their cell phone number on the UTC, the system will automatically send an SMS notification to customers when their number is coming up. Also, every queue ticket has a unique QR code. Because the system is web-based, customers can check the queue status online by scanning this QR code with their mobile device.

Last but not least, the intelligent queue management system can generate daily queue reports, providing real-time and historical queue data, including average waiting times and numbers of customers. The restaurant's management team can improve their services based on this data.

With the help of Advantech's intelligent queue management system, the restaurant not only solved the issue of long lines at its entrance blocking the hallway of the mall, but also improved the management and operation of the restaurant. The solution also provided a superior experience to customers, giving them the flexibility to continue shopping while waiting for seats to become available at the restaurant.

**Impeccable hardware underpins complete solution**

The restaurant's well-received queuing management service is made possible by Advantech's complete solution that integrates software and hardware. The products used in Advantech's intelligent queue management system are Advantech's UTC-520 ubiquitous touch computer with a thermal printer, and DS-570 digital signage player with a 42" LCD screen.

The UTC-520 is a powerful device that is also highly energy efficient. It features a 21.5" touch computer with AMD G-series T40E processor. Its fan less design and IP65 rating for water and dust resistance provide users with unmatched reliability. The support for both landscape and portrait screen orientation and rich I/O give diverse possibilities for all kinds of applications. Moreover, the aluminum frame with side groove design allows for flexible peripheral installations. The UTC-520 is easy to integrate with key peripherals and display systems for diversified self-service and promotional usage in various application areas. The system delivers real-time information with well-designed interactive interfaces, ensuring relevant content and targeted promotions.

Advantech's DS-570 comes with an Intel Celeron N2930/J1900 quad-core processor as well as an nVidia GeForce GT 730M graphic engine for ultra HD playback signage. The DS-570 boasts excellent video outputs, including two HDMI ports, one DP port, and one VGA port for up to four displays. It is highly expandable via the internal mini-PCIe interface, and its compact and fan less design allows for easy installation and great durability. Also, the built-in content management software provides functionalities such as content editing, scheduling, and remote monitoring.

Other than the intelligent queue management system, Advantech offers a wide range of solutions in the hospitality sector. For restaurants to further improve its management, operations, and services, as well as accelerating its digital transformation, solutions such as intelligent POS, customer surveys, e-menu,self-ordering, and intelligent kitchen display systems could be considered.

Undoubtedly, with the implementation of Advantech's comprehensive solutions of both software and hardware, digital transformation in the hospitality sector can be considerably enhanced and accelerated, paving the way for a completely digitalized sector.■

# Interactive Self-Service Kiosks

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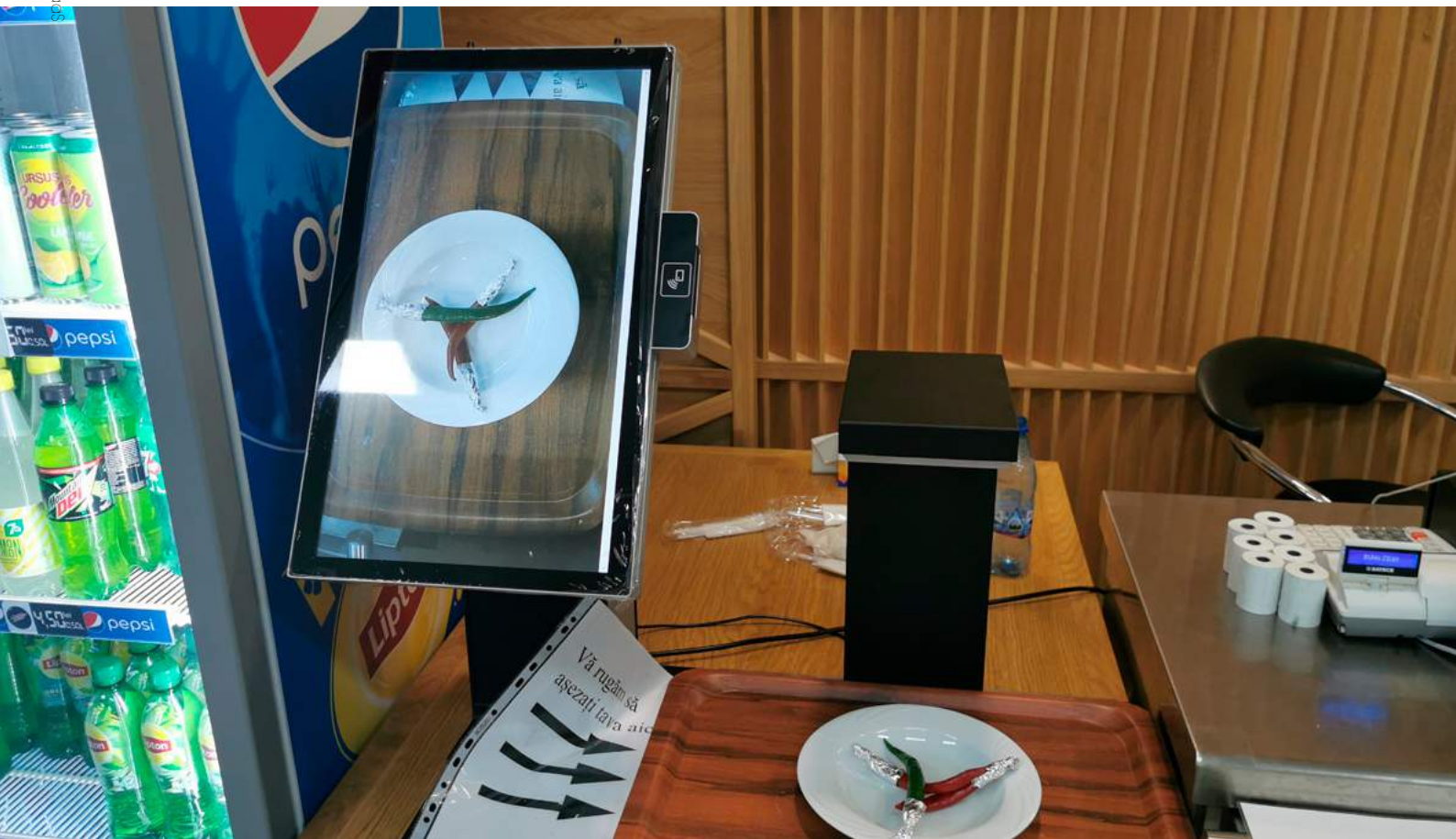
# Neurolabs' Self-Checkout Kiosk Provides Queue-Free Experience for Customers

**Images provided by Neurolabs**
**Interview with Remus Pop, Co-Founder & Head of Solutions, Neurolabs**

To solve the issue of long queues at canteen and cafeteria counters, the AI startup Neurolabs used Advantech products for a cashierless solution called Neurolabs Zia checkout, which leverages computer vision technology to reinvent the checkout process and give people a better dining experience.

Manpower shortages have become a serious issue across Europe. Many canteens and cafeterias are understaffed, causing congestion and unpleasant experiences for both operators and customers, especially during peak periods. The only way to solve this problem is to leave the highly repetitive tasks of checkout counters to technology. The AI startup Neurolabs, launched a self-checkout kiosk solution called Neurolabs Zia, which incorporates computer vision technology to solve the issue of queues for checking out, allowing food





service companies to allocate manpower to higher value-added tasks such as face to face customer service and catering to their needs.

**Demand for automation in a market characterized by manpower shortages**

According to Remus Pop, Co-Founder and Head of Solutions at Neurolabs, the company sought to gain a better understanding of the food service industry. It found that for canteens and cafeterias to attract more customers, business owners need to pay attention to a great deal of operational details. Other than the diversity and taste of food, and the dining environment, a fast and easy checkout process is extremely important. Business owners should thus seek automated checkout systems featuring easy installation and operation.

Neurolabs developed an automated kiosk similar to a virtual cashier. The kiosk allows customers to simply put their tray of food under a camera. After which the system will identify all items on the tray and display their names and prices on a screen in seconds. Once customers confirm their order, they can pay with a card to complete the checkout. Compared to the traditional way of manually keying in every single item on a POS terminal, or scanning each item's barcode like self-checkout systems, the solution developed by Neurolabs is even more hassle free.

Neurolabs' system has been implemented in many European countries. Remus Pop explained that "generally speaking, it takes about six months to complete the implementation of a cashierless system in a canteen, including the integration with the POS system, data gathering, creating algorithms, and conducting tests. However, to meet customer demands, Neurolabs has now fine-tuned the process to about a month due to an innovative technological approach."

**Advantech is a key partner**

Neurolabs, as a startup company, is able to meet customer demand in terms of both application models and system implementation processes due in large part to Advantech, which Neurolabs selected as a partner. Pop pointed out that Neurolabs seeks to grasp the right business opportunities, launch products swiftly, and develop them in an agile manner. Advantech shares this philosophy and approach. The two companies thus complemented each other very well. "We were truly


impressed when Advantech created the first product for us within three months after our initial joint meeting," said Pop.

Initially, Neurolabs evaluated numerous hardware vendors; only Advantech's products offered the quality and design style that met its expectations. Cashierless kiosks interact with people, and must be eye-catching so that people are willing to try and operate them. Lightweight and aesthetic designs are thus critical attributes, and Advantech's products didn't disappoint.

In addition to delivering excellent hardware products, Advantech also gave many useful suggestions during the development process. For example, Advantech recommended that Neurolabs develop basic functions first and gradually add other functions later to optimize computing performance; rather than complicate the system with too many fancy but unnecessary functions. Pop emphasized that Advantech has provided valuable advice on product design and business promotion after product launch.

Styrbjörn Torbacke, Head of iRetail Europe of Advantech Service-IoT GmbH, added that Advantech went to check the environments of the canteens and built three different versions for Neurolabs during the development process. Neurolabs also put forward some hardware design suggestions, for example increasing the brightness of the lights next to the camera to improve image recognition.

Neurolabs plans to apply this image recognition system to more industries, including supermarket retail channels, and even in the manufacturing sector for the detection of defective products on the production line to help and improve quality control. As for the current solution, new features are being developed to meet the needs of more complex application scenarios, including the addition of camera lenses. Neurolabs is looking forward to working with Advantech on these endeavors.■



# Fast-Food Chain Improves Operational Efficiency with Advantech's Kitchen Display System

**Images provided by Advantech**
**Interview with Henry Huang, Sales Supervisor, Advantech**

Advantech collaborated with Information Technology Total Services (ITTS) to build a kitchen display system (KDS) for a renowned fast-food chain in Taiwan, creating comprehensive software and hardware systems and providing customized services to improve the chain's efficiency and dining environment.

With the help of modern technology, the food and beverage sector has greatly enhanced operational efficiency and service quality. In the fast-food industry, the process from ordering to cooking has been completely digitalized to deliver even faster service. After orders and payments are made on self-service kiosks, the orders are sent to the KDS, prompting staff to start preparing the ordered meals. When the meals are ready, customers are notified to pick them up at the counter. This digitalized process has eliminated human errors, simplified ordering, and improved operational efficiency.

Service models like this one are becoming more frequent in fast-food restaurants around the world. A renowned fast-food chain in Taiwan is actively implementing various smart applications in-store to provide customers with higher service quality and a better dining environment. Advantech, a global leader in the fields of IoT intelligent systems and embedded platforms, together with ITTS, has helped the chain build a KDS featuring seamless hardware and software integration to improve efficiency in kitchen operations and elevate sanitation standards.

**Impeccable hardware complemented by well-designed software**

In the competitive world of fast-food, speed is everything. However, this particular chain is very different from most. The staff is trained in Japanese-style service and with food made to order, which means efficiency in the kitchen is paramount. The internal operation process is highly optimized, and every station in the kitchen has a specific task. Nevertheless, like in all kitchens, one sanitary issue remains problematic—oil stains.

The material of the chain's old kitchen hardware system was plastic, which is not ideal because plastic is more susceptible to oil stains than other materials. Also, the hardware system was not in an airtight enclosure; greasy air particles and dust could get inside the hardware, causing malfunctions and shortening the equipment's life span. Hard-to-clean hardware will, in the end, affect the whole environment of the kitchen, resulting in sanitation issues.

To solve this, ITTS collaborated with Advantech and employed the UTC-515 for the KDS. Advantech's UTC-515 is an all-in-one, low-power-consumption and fan less computing system. Featuring a 15.6" monitor with 16:9 widescreen display and a patented all-aluminum extrusion design with IP65-rated water and dust resistance. It offers easy integration with key peripherals and display systems for diversified self-service, as well as interactive signage. The UTC-515 was paired with a module barcode reader, RFID reader, smart card reader, magnet strip reader, and a fingerprint reader to support various types of cashless payment.

Furthermore, in accordance with the chain's request, Advantech provided four specific customizations to help resolve the issue of oil stains. The projected capacitive (PCAP) touch panel was coated with an extra layer of AS coating for oil resistance and prolonged life cycle. At the rear of the UTC-515, a special opening was put in place for easy access to the hard drive for replacement or repair. A non-grooving aluminum frame design was added to seal off the front panel, rear cover, and I/O cover to prevent oil stains from entering. Lastly, a customized cable management box allowed for the proper storage of cables. More importantly, Advantech sent experts for on-site assistance with the initial installation and provided additional training to the chain's staff for future installation procedures.

**Advantech provides complete and comprehensive solutions**

The implementation of the KDS is merely the beginning of potentially long-term collaboration between Advantech and the fast-food chain. There are many other smart applications that the chain could implement because of Advantech's many partnerships with system integrators in the food service industry. Indeed, Advantech provides complete intelligent solutions and services for this industry. Including intelligent POS, interactive multimedia broadcast, e-menu and self-ordering, intelligent KDS, customer survey, and intelligent queue management systems. Many of these solutions have been successfully adopted by food service companies around the world.

Advantech leverages these complete solutions to assist fast-food chains in realizing intelligent services, ranging from self-ordering to kitchen operation optimization, so as to make these chains more competitive in the market and boost their business performance.■

# Advantech and FKsystem Co-Creating Self-Service Solutions for Japanese Telecom

**Images provided by FKsystem**
**Interview with Kiyoshi Kojima, CEO, FKsystem**

Advantech has collaborated with Japanese POS system integrator FKsystem, using the UPOS-211 to help NTT docomo—a major Japanese mobile telecom brand—implement a service ticket issuing system that improves customer flows. This has effectively reduced problems associated with manpower resources and increased the quality of customer service.

Japan's society is ageing at the fastest rate in the world. According to statistics released by the Ministry of Internal Affairs and Communications in September this year, the number of people aged over 65 had increased by 320,000. This age group accounted for 28.4 percent of the entire population. All of these figures increased compared to the same period in 2018. Statistics from the World Bank show that the ratio of people aged 65 and above in Japan is the highest in the world.

Japan's ageing population has presented challenges for service providers in sectors such as mobile telecom, retail and restaurants. To overcome the lack of manpower in these sectors, more service providers are adopting new equipment, enabling customers to obtain what they need through partial or full self-service processes. In line with this trend, Advantech's retail partner in Japan, FKsystem, assisted the mobile telecom brand NTT docomo with implementing a service ticket issuing system.

### FKsystem adopts Advantech's UPOS-211 to create automated service ticket issuing system

NTT docomo's service ticket issuing system makes use of Advantech's UPOS-211. When a customer enters a store, he or she can use the UPOS-211 screen to select the type of service needed, then the system automatically prints out a number letting the customer know how long the wait will be.

FKsystem pointed out that the purpose of the service ticket issuing system is to better manage service flows and automatically give the customer a number for the type of service he or she requires. This allows for more efficient service provision, and prevents situations in which customers has to wait for extended periods. If other smart peripherals are adopted, the application scope of this system can become even broader.

System stability is critical when service providers are setting up partial or full self-service models. If systems frequently malfunctions, customers will be less willing to use them, leading to greater workloads for on-site staff and undermining the systems' original purpose.

For this reason, FKsystem chose Advantech for the NTT docomo project. FKsystem believed that the product quality and brand recognition offered by Advantech, a leader in the industrial computing field, would make a real difference. Indeed, the UPOS-211, which is superior to competitors in terms of design, price, and long-term supply, successfully passed NTT docomo's evaluation. The stability of Advantech's product was further recognized following nearly a year of testing. In conjunction with FKsystem's longstanding local business development, this made it the best possible solution for NTT docomo.

### Advantech's complete solution satisfies demand for automated applications in different sectors

Self-service systems are being actively developed across Japan, not only in the telecom sector but also in


retail and restaurants. For most applications, the goal is the same: overcoming manpower shortages. For instance, fast-food chains have adopted self-service ordering systems, allowing customers to order and pay, and then pick up their food at the counter with the receipt from the machine. This is convenient, fast, and reduces waiting lines.

The kiosk solution Advantech designed for self-service systems, the UTK-932, does not only support different payment methods such as WeChat Pay, Alipay, Apple Pay, Google Pay, credit card/debit card, QR code, and NFC. It also comes with an IP65 dust-resistant and waterproof rating, allows for operations in a wide range of temperatures, and is equipped with a display panel easily readable in sunlight, making it also suitable for outdoor environments such as drive-through counters.

Advantech's solution can also be used at airports and hotels, allowing passengers or guests to report for their flight or room. Another application field are hypermarkets, where the solution can automatically recognize different types of bread as well as their weight and price. All of this helps better manage customer flows.

Advantech hopes that POS and kiosk solutions and automated, unmanned, and smart service systems not only assist service providers in tackling the issue of insufficient manpower, but also enable people to enjoy fast and high-quality services, giving them a taste of the amazing possibilities of smart architectures.■




# Ganso Food Implements Advantech's POS System to Improve In-store Service Efficiency and Inventory Management

**Images provided by Ganso Food**
**Interview with Wang, Director of Ganso Food**

To improve the efficiency of in-store services, Ganso Food implemented Advantech's UPOS-211 POS system with various peripherals, as well as the UBX-310 host computer. It can thereby update store inventory data in real time and integrate such data in ERP systems.

Enabling customers to purchase merchandise anytime and anywhere is one of the most important goals for companies in the retail sector. However, with the increasing number of physical stores and online channels, data related to merchandise, sales, and members can become scattered, causing management problems. Ganso Food, a renowned retailer in the food industry that operates in China has experienced these problems.

Ganso Food was established in Taiwan, and entered the Chinese market in 1993, gradually expanding its business there. At present, it operates about 650 physical stores in over 100 cities in China. Ganso Food has also embraced e-commerce, operating on about nine different online channels. With so many sales channels and service points, the company had an urgent need for stronger IT capabilities to manage people, merchandise and stores.

Therefore, Advantech and Ganso Food came together to develop the strategy for smart development. They redesigned its IT structure in 2015, and implemented the SAP ERP system to integrate all online and offline data, consolidating all merchandise and member data on a single platform. In 2017, Ganso Food further updated its POS software and hardware by adopting Advantech's UPOS-211 POS system and various peripherals. The UBX-310 host computer was implemented to combine all in-store data, integrate data with its headquarters' ERP system as well as improve the efficiency of in-store services.

**ERP and POS are key for successful process optimization**

According to Wang, Director of Ganso Food, online orders are delivered from its stores directly to customers. In the past, staff had to evaluate which store was most suitable to process an order. Now, thanks to the integration of online and offline data, the ERP system will automatically send the order to the store that is closest to the customer's location. Staff at the store can check the order on the POS system, complete the process of packaging and dispatching the goods, and then update inventory data on the POS system, which is sent back to the ERP system. This greatly improves the accuracy and timeliness of inventory data.

Of course, the optimization of operational processes cannot be done through the ERP system alone; the upgrading of POS systems at store locations is also of critical importance. As Ganso Food had managed physical stores for many years, the functions of its POS software were lacking, and hardware performance was insufficient as well. As a result, the POS equipment could only be used as a cash register, and was unable to deliver additional features.

Therefore, Advantech and Ganso Food worked in collaboration to update the POS software and hardware equipment and improve in-store operation efficiency in 2017. The company decided to adopt Advantech's UPOS-211 POS system due to outstanding stability, complete certification, a wide variety of peripherals and excellent performance compared to its cost. In addition, the system's compact and lightweight design allowed for efficient space utilization at service counters.

Wang pointed out that the performance boost in POS hardware not only brought improvements for in-store operational efficiency, but also increased added value. Applications that were not able to run on the old POS system (such as remote management) are now operating smoothly on Advantech's UPOS-211.

**Advantech provides excellent services to strengthen collaboration with partners**

One of the aspects that impressed Ganso Food the most in this process was Advantech's service quality. According to Wang, Advantech does not just sell machinery and equipment to customers; it anticipates customer requirements and needs. For example, Ganso Food's IT structure is managed centrally at headquarters, and did not have IT personnel in stores to assist in setting up the POS system. Advantech therefore pre-loaded required software on the POS system, which made it plug-and-play, allowing Ganzo Food's IT personnel to remotely set up parameters and calibrate the system, eliminating the need to be physically present to complete these tasks. This greatly reduced the burden on the IT team and also lowered costs.

Advantech's comprehensive products and high-quality services persuaded Ganso Food to continue its collaboration with Advantech. Having implemented the POS equipment, Ganso Food also chose Advantech's sensors to collect and monitor in-store water and electricity usage data to avoid waste. In one particular case, a Ganso Food store noticed a water leak with this IoT sensing technology, allowing it to step in at an early stage to repair the leak and deal with a problem that may have gone undetected if Advantech's sensors had not been present.

In the future, Ganso Food and Advantech want to explore the possibility of collaborating in the following fields: implementing digital signage solutions for real-time monitoring of factory productivity data and improve management efficiency, or cold chain management solutions to monitor in-store freezer temperatures and manage distribution. Indeed, with help from Advantech's comprehensive software and hardware solutions, Ganso Food is building an efficient management model from the factory to store.■



# PayinTech Collaborates with Advantech to Develop Mobile POS Solution for Cashless Payment Services

**Images provided by Advantech**

The renowned French payment software company PayinTech has collaborated with Advantech on the development of mobile POS solutions for cashless payment services. With the assistance of IoT technology, the organizer of the Hellfest music festival in France utilized these systems to improve the efficiency of on-site sales management, enhance attendees' experience at the festival, and make all purchasing operations at the festival as smooth as possible.

For many companies, managing large amounts of cash in on-site sales can be a tricky business. At large music festivals like Hellfest, managing on-site payments for food, beverages, and other products constitutes one of the biggest challenges. At Hellfest– one of the world's largest heavy metal music festivals held annually in Clisson, France, with more than 180,000 attendees every year–traditional payment methods are not efficient enough, making it necessary for the organizer and store owners at the venue to adopt smart technologies and innovative retail solutions.

**Building payment system with PayinTech's cashless payment solution**

To resolve the issue of efficiency in payment systems, the organizer of Hellfest needed a smart payment system urgently, and PayinTech was able to offer an innovative cashless payment solution.

PayinTech's cashless payment solution offered the attendees a convenient and hassle-free payment method. The solution leverages the advantages of NFC-enabled cards by allowing attendees to top up money on such cards and use them to make payments for food, beverages, or anything else sold on the festival grounds. The NFC-enabled cards could be acquired in advance or at any time during the event, while end-users could top up money on the cards using one of the on-site cashless banks, via online money transfers at Wi-Fi stations, or simply through their smartphones.

However, in the process of building the solution for Hellfest, PayinTech found that most consumer-grade tablets either had insufficient capabilities to run their software or came with an inconveniently positioned NFC reader. The company needed more reliable and professional hardware running on the Android operating system to allow for high-volume commercial use and facilitate the cashless payment solution at Hellfest.

After learning more about the capabilities, ruggedness, and quality of Advantech's products, as well as how these products complemented its own software, PayinTech decided to establish collaboration with Advantech to create suitable mobile POS solutions for cashless payment. Advantech offered assistance with integrating PayinTech's software solution, and together, they determined that Advantech's iRetail AIM-37 tablet with the printer cradle AIM-P701 was the ideal hardware option for the cashless payment solution.

**Benefits of the cashless payment solution**

Choosing the right hardware to implement well-designed software was one of the most important factors in creating a successful solution for PayinTech. After deciding on the hardware, the rest of the implementation process was much less challenging.

During Hellfest, all cashless purchases were processed using the AIM-37. The attendees could use the NFC cashless card to make payments, with store clerks completing payments and transactions by simply placing the NFC card onto the NFC sensing area on the right edge of the display. The solution drastically reduced waiting times, improved attendees' shopping experience, bolstered productivity of the store clerks, and, most importantly, helped stimulate sales. All steps involved in the payment process were simplified with PayinTech's cashless payment solution and Advantech's iRetail solution.

Complemented by Advantech's iRetail solution, PayinTech's cashless payment solution presented

tremendous benefits for attendees, store owners, and the festival organizer. It allowed attendees to manage and link their cards to their user account, keep track of their consumption, find their payment tickets, top up online, refrain from using credit cards, and even declare the loss or theft of their cards, all from a smartphone app. Also, it immensely improved the attendees' payment experience by simplifying all steps of purchasing and paying through the usage of a small card and greatly reduced waiting times, increasing their willingness to buy things and thereby increasing profits for store owners.

With such an all-in-one payment system, store owners could enjoy secure financial flows with no human errors; remotely monitor all sales and statistics in real time with a powerful visualization and data analysis tool on an interactive dashboard; track consumer behavior by monitoring the consumption data, activity data, and push notification reception; digitize store management and collect reliable data which is in compliance with French regulations such as ACPR or NF525 on electronic money and POS standards; and feed the CRM with data to create more profitability in line with consumption profiles. The solution also supported staff management; session management to track certain terminals, cashiers, or dates; blacklist management to dynamically manage blacklists; and gifts and promotions management to identify and track promotions. PayinTech's solution delivered an open ecosystem that enabled the integration of third-party services, opening up even more possibilities for the future.



### Cashless payment solution complemented by superior hardware

The excellent outcomes achieved at Hellfest were the result of fruitful coordination between PayinTech's software and Advantech's iRetail solution—a complete software experience connected with impeccable hardware design. The hardware included Advantech's AIM-37, which is a 10" tablet industrial-grade mobile point-of-sales (mPOS) system with a built-in NFC reader, barcode scanner, and HD Corning Gorilla Glass 3 display offering a mean time between failures (MTBF) of up to 12,000 hours. It boasts a built-in 2-megapixel front camera and 5-megapixel back camera with a battery that supports up to eight hours of operation, as well as a design that is exceptionally thin and lightweight to ensure maximum portability, with thickness of 17 mm and weight of 900 g. Also, the front panel is IP54-rated for water and dust resistance with a directly bonded touch screen that reduces light refraction to enhance visibility. It also offers water tolerance, palm rejection, and glove mode for enhanced operations. In addition to eliminating contamination from water, oil, and dust, the system design prevents water from interfering with the sensor function, making AIM-37 the ideal mPOS for commercial catering and hospitality applications. Moreover, the tablet supports 75 cm native free drop protection without external protective casing. The AIM-37 runs on both Windows 10 IOT and Android 6.0 operating systems, and supports optional module configurations for flexible operations. It can be integrated with various peripherals and flexible installation mounts to support diverse applications.

Another important part of the hardware was the AIM-P701A0, a compact and stylish multifunctional smart cradle for AIM-37 mPOS. It has a 180° swivel design that allows the tablet to be turned to the other side with ease, and is integrated with a pogo pin that supports 5V/3A high speed charging for the AIM-37. The cradle has an embedded high-speed thermal printer with LED power and error indicators that support 80 and 58 mm receipt printing at a printing speed of 200 mm/s. Moreover, it is equipped with diverse I/O interfaces such as two USB Type-A ports, two COM ports via RJ48, and an optional RJ11 for cash drawers, which allows for the connection of various peripherals.

### Opening up more opportunities for future applications

For Hellfest, PayinTech purchased 160 units of the AIM-37 tablet mPOS system and another 140 units for future utilization. PayinTech's cashless payment solution served over 150,000 people at Hellfest in three days, representing a truly remarkable achievement. PayinTech is now ready to promote its products in even more industries.

At the moment, PayinTech is planning to use Advantech's AIM series as the standard hardware solution for its software at future events in Europe, expanding its products into the sectors of tourism and camping, parks and leisure facilities, sports and stadiums, events and festivals, development and aid, and smart destinations. With the help of Advantech's reliable and rugged hardware solutions, PayinTech will never have to worry about falling behind competitors or lacking support.■

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# WISE-PaaS Platform Architecture Accelerates Implementation of Industrial IoT Applications in Public Spaces

**Images provided by Advantech**
**Interview with HS Su, Director of Service-IoT Product Solution Divsion, Advantech**

To realize a broader implementation of IoT applications for smart cities, the Intelligent City Services (iCS) division under Advantech's Service IoT (SIoT) Group is collaborating with partners to co-create industrial applications on the WISE-PaaS platform, focusing on public spaces such as museums, entertainment venues, restaurants and airports in order to build a smart future for urban areas.


Even though it has been nearly 10 years since the emergence of IoT, the problem of fragmentation prevented enterprises from duplicating applications rapidly, slowing down development. However, with the launch of the WISE-PaaS platform in 2014, Advantech began integrating resources and advocating co-creation based on actual demand for smart applications in various sectors. Utilizing its experience in application innovation and knowledge of vertical industries accumulated over the past five years, Advantech plans to promote the

WISE-PaaS Marketplace 2.0 software store in 2020, taking into account both market and technology developments in order to accelerate the implementation of IoT applications globally and unlock the full potential of IoT.

In line with Advantech's overall corporate goals, the SIoT Group is redefining its focus. According to HS Su, Director of Advantech Service-IoT (SIoT) Product Solution Divsion, the SIoT Group is dividing the market into three categories: retail, healthcare, and intelligent city services (iCS). With regard to technology, decoupling and refactoring are carried out on the WISE-PaaS platform to allow system integrators (SI), software developers, technology innovators and other co-creation partners to access and utilize function modules more quickly and efficiently. By working together, industrial applications can be developed and uploaded to WISE-PaaS Marketplace 2.0 even quicker to comprehensively grow industrial IoT applications.

**People-centric iCS applications**

According to Su, the SIoT Group added the iCS segment because it found that smart city was often put in categories such as smart transportation, smart retail, smart logistics, or smart healthcare. Many urban public spaces such as airports, museums, restaurants and amusement parks were grouped under smart retail, even though the business and services in these spaces are very different from those in the retail sector. To more accurately develop standardization of smart applications in these spaces, they had to be separated from retail and given their own category—iCS.

The meaning of iCS is to provide services based on people-centric values. Su pointed out that while industry 4.0 emphasizes improvement in productivity and quality and smart transportation is directed at greater convenience, iCS focuses on people by creating smart services and digitalizing operational management. Three groups of people need to be served. Firstly, service personnel must be equipped to easily and efficiently provide services to customers through smart applications and interact with them in a positive manner. Secondly, customers must be made to feel comfortable through smart applications in restaurants, airports, museums, and other public spaces, which is critical for business owners in creating higher value-added services. Lastly, administrators must be empowered to improve management with the help of smart systems; the importance of data analysis in enhancing service flows and customer services cannot be overstated.

With a people-centric mindset, Advantech's iCS software engineers often visit the spaces for which they are developing application systems, so as to experience the on-site situation firsthand from the perspective of the end-user. In this way, the engineers can develop application services that conform to actual needs. Su gave an example about a project in which an engineer opposed the specifications set by the project manager. The engineer visited the site personally to examine it first hand, discovering that the proposal put forward by the project manager was actually correct and did indeed satisfy user demand. This shows that taking the initiative to think from the perspective of end-users is a worthwhile exercise that strengthens communication and teamwork. Su said since this incident, this engineer always shares and discusses with colleagues new applications in amusement parks, museums, and restaurants he has seen during overseas trips.

**Accelerating smart co-creation with WISE-PaaS and Marketplace 2.0**

Apart from a people-centric service mindset and an organizational structure that matches market demand, Advantech has developed various types of industrial applications through decoupling and refactoring. By uploading them to the WISE-PaaS Marketplace 2.0 software store and allowing partners to easily participate in co-creation, Advantech can solve the issues of fragmentation and duplication in IoT applications.

Su stated that decoupling is divided into two parts. The first part is the decoupling of data. By putting data on the open WISE-PaaS platform, partners and customers can easily access the data and use it to build new industrial applications, improving productivity and resource efficiency. This part of decoupling is not particularly challenging, and has been fully activated. The second part is the decoupling of key services, which is to disassemble application services that have already been developed into many smaller apps. Because this involves redevelopment, it is more challenging. Therefore, Advantech is planning a Kubernetes (K8s) microservices architecture, based on the WISE-PaaS 4.0 platform, to realize the decoupling of key services.

Taking the iCS applications of the SIoT Group as an example, there are common applications (Common Apps) on WISE-PaaS Marketplace 2.0 suited for all industries, such as dashboard, notification, and OTA applications.

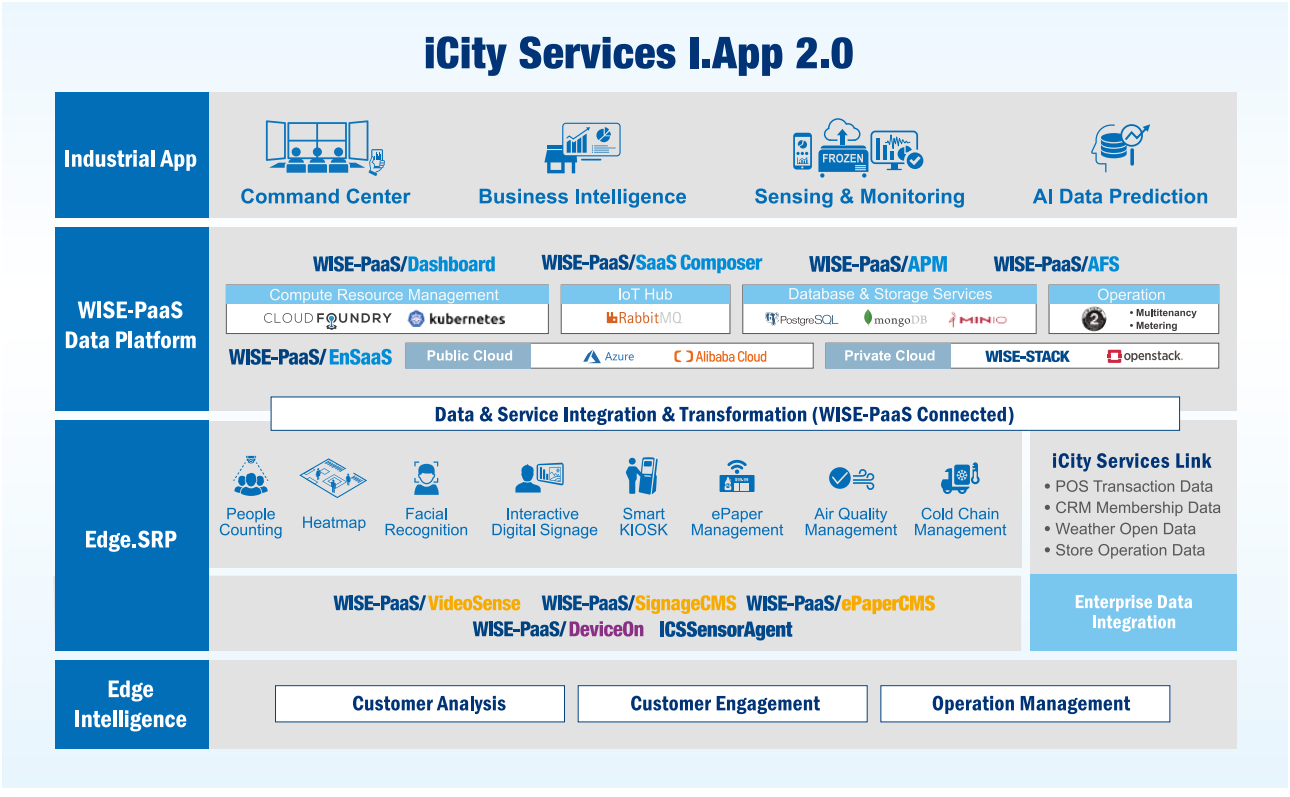
Then there are industrial applications (Industry Apps) that are developed either by Advantech or by SIs, such as people counting analytics, signageCMS management, and air quality management applications. And finally, there are domain-focused applications (Domain Apps), which cannot be standardized and require a high degree of customization, such as applications for indoor navigation and guided tours in museums. Applications like these are co-created by Advantech, SIs, and software developers.

Su elaborated that industrial applications developed by Advantech on the WISE-PaaS platform for general use can be directly provided to customers. However, for certain vertical markets, Advantech and its partners use the industrial applications as the basis to develop customized domain-focused applications for specific requirements, and then upload them to the WISE-PaaS Marketplace. Both industrial and domain-focused applications are open for redevelopment and re-innovation by other developers. Thus, through such a virtuous cycle, applications can be developed that precisely meet demand in each sector.

### Further boosting worldwide adoption of IoT applications in the coming five years

In the iCS field, Advantech has already established partnerships with numerous SIs to jointly engage in co-creation. For example, International Integrated Systems, Inc. (IISI), a company with over 30 years of experience in building professional information systems, has used WISE-PaaS to develop industrial and domain-focused applications for the smart city sector. In the future, IISI will use these as the basis to collaborate with other developers on the WISE-PaaS platform to develop even more industrial applications. The number of applications on the platform will thereby increase exponentially. “Within three to four years, the WISE-PaaS platform will become one of the most important platforms for global industrial IoT applications,” said Su.

When promoting smart applications in the past, Advantech concentrated primarily on embedded/pre-installed software, with a strong focus on the performance and reliability of the hardware. But in the past five years, Advantech has placed greater emphasis on software development specifically for applications. For this, Advantech requires co-creation with even more SIs and software developers, so as to gather the greatest possible momentum in accelerating the implementation of smart applications and fostering advanced and smart lifestyles for generations to come.■



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# Making E-Paper the Ideal Display for Smart Cities and IoT

**Images provided by E Ink**
**Interview with Dr. Paul Apen, Chief Strategy Officer, E Ink**

Smart applications are omnipresent in the world of IoT. To join this trend, E Ink has used e-paper as the basis to build a smart ecosystem. The company is currently collaborating with Advantech in smart transportation and healthcare, co-creating exciting new solutions.

As competition in the display sector has reached a high point, e-paper displays still have great potential. To expand its market share and influence, E Ink Holdings, a leading supplier of e-paper displays for various smart devices, is actively connecting vertical sectors in smart healthcare, smart retail, smart transportation, smart logistics, and smart cities, so as to co-create IoT solutions, promote new applications, and cultivate the e-paper ecosystem.

The characteristics of e-paper displays are very different from those of mainstream displays. E-paper displays (EPDs) boast extremely low power consumption, use reflective display technology, with no backlight, and offer a wide viewing angle. They are easy on the eyes, have high visibility outdoors in direct sunlight. Moreover, they are flexible, rugged, shatterproof, and lightweight thanks to the components of the EPD and plastic-based TFTs. When these crucial features are combined with IoT

technology, e-paper becomes a unique display ideal for smart cities and IoT, generating a new wave of industry growth.

### Cooperating to promote new applications and cultivate an ecosystem

As an e-paper display provider, E Ink conducts research and development of the core technology—electrophoretic display, sometimes referred to as electronic ink—for end-products such as e-readers, wearables, electronic tags, and signage displays. It needs the help of ecosystem partners to integrate this key technology with various applications to meet market demand. According to Paul Apen, E Ink's Chief Strategy Officer, it is vital for E Ink to maintain close relations with ecosystem partners in product development, applications, and marketing in order to accelerate the implementation of e-paper products in vertical markets and make e-paper more diverse.

E Ink is thorough and careful in selecting partners. The company looks for partners that have strong alignment with its business model and approach, so as to ensure success in sustaining the ecosystem, as well as partners with the ability to design and build reliable hardware systems that offer stable platforms that can run content management systems and connect devices to the backend applications. The company also works with system integrators (SI) to consolidate all components, panels, hardware, and software creating integrated systems that offer comprehensive solutions to end-customers. For E Ink, building such a value chain is a crucial part of its business strategy.

### Co-creation Achievements with Advantech

E Ink has collaborated with Advantech for co-creation in many sectors. In smart transportation, the two companies worked together to develop bus stop signage display and smart parking meter solutions. Also, in the healthcare industry, E Ink has teamed up with Advantech in developing the LEO-D e-paper solution for smart healthcare and smart warehousing for inventory management.

At Computex 2019 in Taipei, E Ink and Advantech showcased their co-creation of a LEO-D e-paper solution for the smart healthcare sector. Together, E Ink and Advantech demonstrated applications in medical fields such as medicine box tags for drug inventory management, UD cart labels for medication bin administration, ward cards for patient information, and bed head cards. Smart healthcare products are connected to each e-paper devices through sub-1GHz wireless communication technology, which enables medical staff to update information through the LEO-D device manager and display it on the screen at the front desk, effectively improving efficiency and realizing smart, paperless, and safe management. Moreover, in a hospital environment, this helps prevent screen light from disturbing patients' rest. The E Ink-Advantech solution has been successfully adopted in hospitals across Taiwan.

Invited by Advantech to participate as a guest speaker in CCPC 2019 in Boston, Apen was amazed by the energy of the event. Partners and customers showcased and shared co-creation ideas, building awareness in the US market. It is imperative for this kind of event to be conducted, as it contributes to the exchange of experience among regional and global partners and customers.

Apen pointed out that the concept of co-creation is ingenious, as it benefits all parties involved. Indeed, the model will continue for years to come. Looking ahead, Apen expressed his belief that e-paper will be the next new trend, with co-creation playing a key role. E Ink will continue to collaborate with partners to push innovation through co-creation, launching more color products including full-colored, advanced, color e-paper (ACeP) displays that are rugged and lightweight with excellent functionality and flexibility.■

# Advantech's AIM Team to Collaborate with SOTI

At the SOTI SYNC 2019 event, which was held in Toronto from October 7-10, Advantech's AIM team reached an agreement to collaborate with SOTI, the world's leading provider of enterprise mobility management (EMM) solutions. Under this agreement, the two companies will pursue integrated business mobility solutions to fulfill diverse demand from vertical markets such as logistics, retail, and healthcare.■

*SOTI certified solution: AIM-35/AIM-68/UTC-515/DLT-V72/MICA-053



# Advantech to Showcase E-IoT and S-IoT Solutions at the 2020 Integrated System Europe Exhibition

Advantech, a worldwide leader in IoT solutions, will be participating in the 2020 Integrated System Europe (ISE) exhibition—the world's largest event for AV and system integration—to showcase its comprehensive EIoT and SIoT solutions.

At the ISE exhibition, which will be held February 11-14 in Amsterdam, Netherlands, Advantech will highlight DS-players and monitors for EIoT solutions, as well as the UTC series, AIM mPOS series, USM and Ushop+ for SIoT solutions, by giving customers and visitors a memorable museum-style tour of its booth.■

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