

My WISE-PaaS

An Advantech Magazine Embedded IoT 2022-2023

Advantech View

Advantech Establishes Edge+ Ecosystem to Accelerate AIoT Deployment
P.06

Application Story

Rastek ID Collaborates with Advantech to Develop a Cost-Effective, AI-Powered Production Line Monitoring Solution
P.14

WISE-PaaS

Co-Creating Industrial IoT Successes with the Advantech WISE-IoT Ecosystem
P.30

Customer Partnership

Advantech Forms an Alliance with Freedom Systems to Provide Industrial IoT Operation and Maintenance Services
P.32

Edge+ Empowers the Future of AIoT

Edge+



Intelligent ePaper Bedside Cards Streamline Ward Information Flow in Yeezen Hospital
P.20

ADVANTECH 
WISE-PaaS
AIoT Solutions & Marketplace



■ Advantech View

Advantech Establishes Edge+ Ecosystem to Accelerate AIoT Deployment



■ Application Story

Advantech's Edge Visualization Solution Improves Digital Signage in Cambodian Shopping Mall



■ Customer Partnership

Advantech Forms an Alliance with Freedom Systems to Provide Industrial IoT Operation and Maintenance Services



Published by
Advantech Co., Ltd.

Publisher
K.C. Liu

Address
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
Taipei, Taiwan 11491
Tel. +886-2-2792-7818
Website www.advantech.com

Editorial Supervisor
Brand Development & Public Relations

Edit Production
Herdo Integrated Marketing Co., Ltd.

Initial Issue 2007.09.15
All rights reserved. Reproduction without permission is
strictly prohibited.

■ Editor's Desk

05 Co-Creating with Global Partners to Accelerate the Deployment of Edge Intelligence

■ Advantech View

06 Advantech Establishes Edge+ Ecosystem to Accelerate AIoT Deployment

■ Power Insight

08 Intel, Advantech Jointly Create a Future Paradise for Intelligent Edge

09 Creating a Cornerstone for Innovative AI & Graphics-Driven Applications

10 Advantech and NXP Join Arm's Project Cassini to Simplify Product Development and Enhance Product Security

12 Advantech and NVIDIA Deliver AI Powered Edge Services for Next-Gen Medical Equipment

13 Microsoft Leverages Advantech's Multiple Roles to Build the IoT Edge Ecosystem

■ Application Story

14 Rastek ID Collaborates with Advantech to Develop a Cost-Effective, AI-Powered Production Line Monitoring Solution

16 Advantech Partners with Leading EV Charging Solution Supplier to Develop Rapid Chargers

18 Advantech Industrial Wireless Solutions Help US Healthcare Institutions Boost Patient Medication Safety

20 Intelligent ePaper Bedside Cards Streamline Ward Information Flow in Yeezen Hospital

22 Advantech Helps Nogata Seiki Accelerate Intelligent Transformation

24 Advantech's Edge Visualization Solution Improves Digital Signage in Cambodian Shopping Mall

26 Advantech Assists AUBO Robotics with Building Massage and Physiotherapy Robots

28 DENSO WAVE and Advantech Offer a User-Centric IoT Data Server to Promote Industry 4.0

■ WISE-PaaS

30 Co-Creating Industrial IoT Successes with the Advantech WISE-IoT Ecosystem

■ Customer Partnership

32 Advantech Forms an Alliance with Freedom Systems to Provide Industrial IoT Operation and Maintenance Services

■ Advantech News

34 Advantech Connect Online Partner Conference: Edge+ to the Future of AIoT



About Embedded IoT

Edge+ Empowers the Future of AIoT

5G, AI, and high-performance edge computing are driving the growth of AIoT, resulting in the increased popularity of edge intelligence. A study by Gartner indicates that the edge computing market, including software and hardware solutions and integrated services, will reach a value of US\$450 billion by 2025. As a pioneer and leader in the embedded market, Advantech continuously researches and develops value-added embedded software services, leading embedded technologies, and innovative form factors. To exploit these trends, Advantech has worked with its global partners to create a comprehensive Edge+ solution and ecosystem blueprint that accelerates the adoption of AIoT applications.



Edge Intelligence Solution



Embedded Design-in Services

Co-Creating with Global Partners to Accelerate the Deployment of Edge Intelligence

As the latest generation of technologies mature, 5G, AI, and high-performance edge computing have become significant drivers accelerating the emerging wave of edge intelligence in the IoT industry. According to Gartner, the value of the edge computing market is projected to reach US\$450 billion by 2025. Accordingly, this issue of MyWISE-PaaS Embedded magazine focuses on the theme of edge AI and edge-to-cloud solutions.

In the Advantech View column, Mr. Miller Chang, President of Advantech's Embedded-IoT Group, explains how Advantech has integrated internal and external resources to create three growth engines, and established a comprehensive blueprint for an Edge+ ecosystem together with global partners in order to accelerate the deployment and implementation of AIoT applications.

The Power Insight section explores how Advantech has worked closely with six industry leaders — NVIDIA, Intel, NXP, Arm, AMD, and Microsoft — to co-create and launch various software and hardware solutions. This includes how the collaboration between Advantech, Arm, and NXP in Arm's Project Cassini is helping simplify the product development process and reduce development time and costs. It also highlights how Advantech's role as an Azure cloud solutions provider (CSP) is attracting more ecosystem partners while helping Microsoft and

Advantech promote industrial cloud strategies.

The Application Story section presents 8 case studies regarding smart applications that utilize cutting-edge technologies, such as edge AI, machine vision, and collaborative robots. These case studies describe how AUBO Robotics partnered with Advantech to create a collaborative robot that provides massage and physiotherapy services, and how Yeezen Hospital adopted Advantech's ePaper display solution for its digital bedside cards, significantly reducing staff workloads and improving doctor-patient relations with the provision of enhanced care quality.

To accelerate AIoT deployment for a greater number of applications, a CSP capable of providing security and maintenance services is essential. Accordingly, Advantech has extended its AIoT ecosystem to the IoT CSP sector. In the Customer Partnership column, Hank Yu, CEO of Freedom Systems, discusses how Advantech and Freedom Systems co-create secure IoT applications from IT to OT.

The proliferation of edge AI is expected to accelerate the deployment of AIoT in various sectors worldwide. Advantech will continue on its mission of enabling an intelligent planet by creating more innovative and safe smart solutions that leverage seamlessly integrated software and hardware. ■

Advantech Establishes Edge+ Ecosystem to Accelerate AIoT Deployment

To accelerate the deployment of AIoT applications with edge computing and AI, Advantech integrated its resources to create three growth engines and establish a comprehensive Edge+ ecosystem blueprint in collaboration with global partners.

Photos provided by Advantech
Interview with Miller Chang, President of Advantech Embedded-IoT Group

With the ongoing evolution of various technologies, 5G, AI, and high-performance edge computing have become significant drivers generating the proliferation of edge intelligence in the IoT industry. According to Gartner, a technology research and consulting company, the global edge computing market is expected to reach a value of US\$450 billion by 2025.

Mr. Miller Chang, President of the Embedded-IoT Group at Advantech, pointed out that Advantech is riding the perfect wave, with edge computing driving forward the rapid global deployment of AIoT. Leveraging over 30 years of experience in embedded computing, design-in services, and worldwide local service capabilities, Advantech has integrated internal resources and broadened its partner network to establish three growth engines. With these growth engines as the foundation, Advantech created a complete blueprint for its Edge+ ecosystem strategy to accelerate the global deployment of AIoT applications.

Collaborate with mainstream chip suppliers to design an Edge+ hardware development platform

Demand for edge computing has exploded because vertical industries are actively seeking to

introduce IoT applications. This trend has prompted mainstream semiconductor suppliers around the world, including Intel, NVIDIA, Arm, NXP, and AMD, to increase their investment in the emerging field of edge computing. Accordingly, suppliers have been integrating AI into numerous products, resulting in the proliferation of dedicated edge computing chip solutions. Previously confined to CPUs and GPUs, such edge computing solutions have now been extended to accelerated processing units (APUs) and vision processing units (VPUs), promoting the universal adoption of edge AI.

“In keeping with the development of diverse processors, Advantech has partnered with global semiconductor suppliers and created an Edge+ hardware development platform dedicated to IoT applications,” emphasized Mr. Chang. To accommodate different chip architectures and multiple processor types, at least 10 of Advantech’s business units have adopted 5G, AI visual analytics, and high-performance computing technologies to launch various edge computing platforms. In addition to prompting traditional IEMs to upgrade their equipment



portfolios, the scope of smart Industry 4.0 applications has expanded from healthcare and smart cities, to include retail, transportation, logistics, and in-vehicle applications.

Boost digital competitiveness and develop Edge+ software to create value

Because software is at the core of AIoT applications, Advantech’s efforts to promote the development of edge computing hardware devices involves constantly enhancing its software development and innovation capacity to strengthen the intelligent functionality of IoT.

To meet the software demands for AIoT applications, Advantech’s Embedded-IoT Group established a WISE Edge+ team dedicated to developing IoT application software and services. For example, the team launched Ubuntu IoT services, which can be integrated with Advantech’s x86/Arm™ hardware platforms, to provide comprehensive value-added services for deployment-ready IoT devices. Advantech also expanded the functions of its WISE-DeviceOn software platform. Widely used to remotely manage IoT devices, WISE-DeviceOn is a powerful management solution compatible with various edge and AI processors and operating systems, making it suitable for diverse vertical industries.

Moreover, to encourage the development of more AI applications, Advantech launched its Edge AI Suite to coincide with the release of new AI chip modules by major semiconductor suppliers. To address security issues, Advantech recommends using DeviceOn for Azure as the central hub for integrating IT and OT to provide a comprehensive total security solution that satisfies the information security requirements of many application fields.

Develop domain-focused solutions and invite global DFSIs to join the Azure CSP ecosystem

It is not enough to have both hardware and software platforms in place. In order to assist system integrators with deploying AIoT applications easily, Advantech’s third growth engine embodies the company’s commitment to supporting the development of domain-focused solution ready packages (SRPs).

The purpose of these SRPs is to automate processes for semiconductor manufacturing equipment and green energy storage applications. Mr. Chang stated that SRPs reduce the time domain-focused system integrators (DFSIs) need to develop an application, which accelerates both the time to market and eventual deployment.

Furthermore, because many businesses lack the ability to maintain their IoT systems, Advantech, in cooperation with Microsoft, proactively recruits seasoned IT service providers from around the world to serve as Azure IoT cloud solution providers (CSPs). These CSPs assist companies with maintaining their IoT systems and ensuring their IT and OT is secure. Leveraging their unique expertise and marketing resources, Advantech and its partners are better able to explore cloud-based IoT opportunities and co-create an Azure IoT CSP ecosystem that provides customers with superior products and services.

Finally, Advantech created a comprehensive blueprint for using Edge+ to promote AIoT applications globally. By 2025, Advantech plans to have a further 13 business units dedicated to promoting IoT. This will assist regional offices and global partners with making coordinated progress and demonstrate Advantech’s commitment to its corporate vision of “enabling an intelligent planet.” ■

Intel, Advantech Jointly Create a Future Paradise for Intelligent Edge

Photos provided by Intel
Interview with Dr. Wei Chen, Vice President and General Manager of Video Safety & Security Business and IoTG China, Intel

The integration of edge computing, AI, and 5G technologies will accelerate the development of Intelligent Edge, a market that is estimated to exceed 65 billion USD by 2025. Dr. Wei Chen, Vice President and General Manager of Video Safety & Security Business and IoTG China at Intel, indicated that seizing this huge market opportunity requires product leadership, innovative solution promotion, and ecosystem development to accelerate establishing innovative intelligent edge business models that help industries incorporate AIoT applications sooner.

Intel provides various hardware products for the intelligent edge, including CPUs, FPGAs, Movidius VPUs and GPUs. This provides customers flexible processors based on actual needs. Remarkably, Intel recently launched its first Alder Lake CPU, which heralds a “significant breakthrough in x86 architecture” as it combines both high-performance and high-efficiency CPU cores into a single product. Intel has also developed the OpenVINO toolkit, which supports both traditional computer vision and novel deep learning technologies, making it easier for vision application development. They have also introduced the edge-oriented Intel® DevCloud for the edge, enabling developers to test applications on multiple AI hardware platforms on the cloud and then select the most cost-effective solution.

Building ecosystems has always been a part of Intel’s DNA, Intel has enlisted more than 300

partners worldwide to collaborate in developing edge computing solutions. “Intel’s edge ecosystem includes system integrators, ISVs, hardware manufacturers, IoT solution developers, and other roles, and Advantech is one of our most important partners” Dr. Wei Chen noted.

Intel and Advantech have been cooperating for more than 30 years. Both parties recently recognized a trend emerging in edge computing and have quickly joined hands to innovate intelligent edge solutions. So far, they have jointly launched AI acceleration cards and an inference system based on Movidius VPU, the Edge AI Suite with the Intel OpenVINO toolkit, which can cooperate on DevCloud, helping developers accelerate edge AI solution development in different industries.

In promoting the implementation of AI and IoT applications, Advantech continues to achieve breakthroughs, providing software and hardware products and services for IoT cloud platforms. Both companies have also developed “LEGO-like” modular software/hardware solutions that enable quick replication, making it easier to implement IoT applications across vertical industries. Sharing the same approach to promote intelligent edge, Intel and Advantech plan to continue their collaboration in making it more adaptable in more industries. ■



Creating a Cornerstone for Innovative AI & Graphics-Driven Applications

Photos provided by AMD
Interview with Mr. Gary Blackington, Sr. Director, WW Embedded Sales of AMD

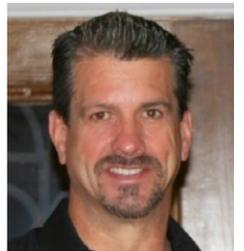
Driven by advancements in edge AI, intelligent video analytics, and many new graphics-related industrial applications have been derived from these technologies, including machine vision, traffic flow analysis, and medical imaging. An immersive, responsive, and low-latency user experience requires reliable and high-performance computing power both at the edge and on the cloud. By leveraging Advantech’s off-the-shelf AMD hardware platforms, customers can focus on developing AI and graphics-driven applications and accelerate their time to business outcomes.

According to Mr. Gary Blackington, Sr. Director at AMD WW Embedded Sales, AMD’s innovation strategy prioritizes integration as a key differentiator, and the company remains committed to achieving the optimal balance of core scalability, power efficiency, and security across its processor solution. Being able to flexibly scale the core count while optimizing power dissipation enables various processing performance profiles for greater design agility.

Within the IoT domain, AMD’s support for extended temperature ranges and low-power operations means reliable off-premises processing performance in harsh outdoor environments. It also helps enable Advantech’s fanless designs and further maximizes reliability and protection against particle/moisture ingress. Power-efficient processing is particularly critical, and AMD’s ability to facilitate low-power profiles can complement parallel innovations in

battery-powered sensors and devices, making for greater deployment flexibility, particularly in remote areas where solar is an attractive power source. Advantech platforms based on the AMD EPYC™ and RYZEN™ processors exemplify these efforts. They provide an off-the-shelf range of network appliances, edge computers, and hyper-converged infrastructure and storage systems targeting edge and IoT deployments. By promoting higher levels of integration in its processing solutions, AMD can help Advantech cost-effectively leverage common platforms that can be optimized for a wide range of power and performance profiles.

When it comes to building the ecosystem, AMD works closely with leading third-party board providers and software developers focusing on designing platforms that leverage AMD’s unique processing and integration innovations. By sharing the technology vision with industry leaders like Advantech, AMD supplies its deep application expertise to help end customers achieve ambitious design goals. AMD’s expansive partner and software ecosystem both support and benefit from Advantech’s achievements in developing market-leading platforms in domains including industrial PCs, IoT, networking, 5G infrastructure, and edge AI. Advantech solutions built atop AMD processing innovations are truly trustworthy cornerstones for AI and graphics-driven applications. ■



Advantech and NXP Join Arm's Project Cassini to Simplify Product Development and Enhance Product Security

To prepare customers for the tremendous IoT growth, NXP® Semiconductors and Advantech have become affiliated with Arm's Project Cassini, which helps simplify the product development process and reduces development time and cost.

Interview with Olivier Bernard, Director of High-Performance IoT at Arm; Justin Mortimer, Global Marketing Director of Edge Processing for NXP® Semiconductors and Aaron Su, Vice President of Embedded IoT Group at Advantech discuss the benefits of Project Cassini.

Tremendous growth in IoT has led to many organizations acquiring massive amounts of data from many sources. According to a forecast by Statista, the total number of installed IoT devices worldwide will reach almost 31 billion units by 2025, a sharp jump from the 13.8 billion units from 2021.

For years, the IoT industry has deployed IoT solutions using the model of transmitting raw sensor data throughout IoT infrastructure. However, to increase the value of services, businesses are demanding more immediate responses and more immersive experiences at the point of service. Edge computing and AI solutions address this need and allow decisions to be made based on insights in real time near the source of data generation. Thus, the IoT industry must embrace cloud-native software principles, consistently and securely, enabling distributed compute models from the cloud to endpoints, and deploying intelligence at the edge.

Project Cassini tackles IoT roadblocks

Arm technology plays a critical role in edge computing, with the Arm ecosystem providing compact, low power SoC solutions for a range of different vertical applications from industrial to smart home. However, the lack of hardware and firmware standardization between different SoCs has led to considerable overlap regarding development time and cost, hindering the deployment of edge computing applications.

Mr. Bernard, Director of High-Performance IoT at Arm highlighted two major roadblocks to IoT deployment: scalability and fragmentation. Thus, we need consistency and compatibility across the entire IoT ecosystem, from smart endpoints through IoT gateways and the cloud. This is why Arm founded Project Cassini—an open, collaborative, standards-based initiative to deliver a seamless cloud-native software experience for devices on Arm Cortex-A. It reduces the complexity of software deployment and makes it simpler to scale. Essentially,

this approach ensures that technology “just works.”

The three pillars of Project Cassini are Arm SystemReady certification program, PSA Certified, and Platform Abstraction for Security (PARSEC), as well as reference implementations for a cloud-native ecosystem. Arm SystemReady disassociates the silicon's SoCs from the software (OS, hypervisors, and containers), ensuring that any off-the-shelf OS can be installed on different SoCs without the need for further engineering work or much finetuning. The PSA Certified program offers a security framework that ensures a security baseline aligned with key standards and use-case requirements for edge IoT devices. The PARSEC open-source project allows cloud-native workloads to find the hardware Root of Trust (RoT) for authentication and orchestration that has become the norm in data centers.

Deliver endless IoT application possibilities with Arm architectures

Advantech has joined the SystemReady program and is working closely with Arm and NXP to launch the RSB-3720 Single Board Computer and EPC-R3720 Box Computer. Both are powered by NXP i.MX8M Plus based on Arm Cortex-A53. Aaron Su, AVP of Embedded IoT Group of Advantech commented, “We adopted NXP's SystemReady compliance Board Support Package and equipped these products with drivers for add-on peripherals and embedded Linux.”

Justin Mortimer, Global Marketing Director of Edge Processing for NXP® Semiconductors, elaborated: “With Project Cassini, we recognize a shared vision—helping customers



reduce the cost and time necessary to deploy advanced technology to the edge. As we look forward, we see an even more software-driven approach to product development, and as such the need to ensure customers can get started easily with new processors on embedded boards or modules, and to be able to quickly use, and re-use, firmware across chipsets and applications.” With Arm SystemReady, Advantech is in a position to bring simplicity and scale to the management of numerous connected end nodes across an application lifecycle.

Project Cassini is a new development paradigm meant to give companies far more technology choices and optimize hardware and software independently of each other, and speed up the development and deployment schedule by reusing cloud-native applications. Mr. Bernard concluded that, in short, it is designed to deliver new and ongoing IoT application possibilities by simplifying deployment and leveraging cloud-native ecosystems. Finally, Mr. Mortimer emphasized that when companies work together with a common goal, prioritizing the journey and experience of engineers attempting to solve challenges that have never been overcome, then amazing results can happen. Widespread industry collaboration is critical to unlocking opportunities around edge AI and moving the market forward, and NXP and Advantech working with Arm as part of Project Cassini is a strong example of the results this can deliver. ■

Advantech and NVIDIA Deliver AI-Powered Edge Services for Next-Gen Medical Equipment

Photos provided by NVIDIA

Attribute byline to: David Niewolny, Director of Business Development, Healthcare/Medical, NVIDIA

To say that 2020 and 2021 have been challenging would be an understatement. The COVID-19 pandemic has had an unprecedented impact on the way we live, the way we work, the way healthcare is practiced, and the way the medical device industry operates.

According to studies by McKinsey and Deloitte, digital adoption accelerated 5 years in a matter of just 8 weeks, and the adoption of AI by healthcare organizations increased by 73% over the prior year. These challenges have driven medical device companies to seek out technology partners to help them explore new capabilities, specifically regarding the adoption of AI, as well as to accelerate their product-to-market times and lower their development costs. Medical instrument and device companies are continuously striving to make procedures less invasive and more real-time, and AI integration into imaging, image streaming, and workflow has been a key component of this.

NVIDIA's tools enable the global medical device industry to easily adopt AI from the cloud to the edge with Clara, a healthcare-specific accelerated computing platform optimized for NVIDIA hardware and toolkits.

Medical device developers using Clara can quickly and efficiently integrate AI into their existing devices, develop new AI-enabled devices,

and build an AI training infrastructure leveraging a common hardware and software infrastructure. This industry-specific full-stack platform enables the medical device industry to explore new AI-enabled capabilities, accelerate time-to-market, lower development costs, and modernize their business model.

NVIDIA's partner ecosystem plays a key role in bringing this technology to every developer in the healthcare ecosystem, from hardware and software developers to data scientists and physician engineers. Advantech is a key NVIDIA partner, helping to provide digital healthcare solutions and building medical-grade computers aimed at providing AI at the edge for hospital applications and healthcare environments. NVIDIA-powered Advantech products like the Edge AI platform feature support for NVIDIA RTX and Jetson GPUs, and NVIDIA's AI tools and frameworks like RAPIDS, Tensor RT, and Triton Inference Server, providing a foundation for developers to quickly and easily leverage the power of accelerated computing and AI to build next-generation healthcare and medical applications. ■



Microsoft Leverages Advantech's Multiple Roles to Build the IoT Edge Ecosystem

Photos provided by Microsoft

Interview with Crystal Yin, Director, Asia IoT Partner Ecosystem, Global Partner Solutions, Microsoft

Rapid advancements in computing and cloud technologies have seen edge computing—the closest of “things” in IoT—bring significant value and benefits to industrial IoT applications. It is now a technological highlight. Since Microsoft entered the IoT sector in 2015, it has been actively developing edge computing technology and the Microsoft IoT Edge ecosystem to help accelerate the creation of edge-to-cloud smart IoT applications.

Crystal Yin, Director, Asia IoT Partner Ecosystem, Global Partner Solutions at Microsoft, emphasized that accelerating the application of IoT requires win-win collaboration and co-creation between ecosystem partners. This is why building an edge-to-cloud ecosystem has always been a priority for Microsoft. They effectively play the role of an aggregator and collaborator with industry leaders and are thus able to accelerate the creation of cloud-ready IoT devices and solutions.

Due to having more than 30 years of experience in industrial computing and multiple roles in the ecosystem, Advantech is Microsoft's most critical strategic partner in promoting the IoT Edge. Even before Microsoft started adopting its cloud strategy, the two companies had been cooperating in traditional industrial automation for many years. This long-term partnership has

shown that Advantech has the resources Microsoft needs to promote its edge-to-cloud IoT strategy in many aspects.

Advantech's WISE-PaaS IoT cloud platform, WISE/DeviceOn, and other cloud-native IoT application systems can all be built on Microsoft Azure Cloud Services. As a manufacturer of IoT devices, Advantech has more Microsoft Azure IoT device certifications than any other company in the world. The two companies are now cooperating extensively in the IoT sector. Moving forward, they will explore more vertical industries and work together to create greater synergy for implementing IoT applications.

Ms. Yin emphasized the enormity of creating the IoT ecosystem, and that Microsoft has recently focused on integrating its resources to assist vertical industries accelerate their implementation of IoT applications. Advantech's rich experience in promoting digital transformation in vertical industries combined with its role as an Azure CSP is attracting more ecosystem partners. This will help Microsoft with promoting its industrial cloud strategy by providing additional resources to drive the proliferation of IoT applications worldwide. ■



Rastek ID Collaborates with Advantech to Develop a Cost-Effective, AI-Powered Production Line Monitoring Solution

Considering the existing facilities and end-customer requirements of a global electronic component and PCBA manufacturer based in Indonesia, Rastek ID and Advantech collaborated to develop a cost-effective, AI-powered solution for production line monitoring.

Photos provided by Shutterstock
Interview with Endro Sulisty, Key Accounts Manager of Advantech Indonesia

According to a 2020 survey conducted by Oxford Economics with 3,000 business executives from around the world, the three technologies that received the highest investment in the preceding three years were AI, IoT, and data analytics. However, Mr. Endro Sulisty, Key Accounts Manager at Advantech Indonesia, pointed out that because of Indonesia's conservative mindset, most businesses are hesitant to implement AI as part of their digital transformation. To date, only the transportation and manufacturing sectors have been receptive to adopting AI-powered solutions.

Nonetheless, Mr. Sulisty recently participated in a project to develop an AI-powered video analytics inspection solution for a multinational manufacturer of electronic components and PCBAs. At the time of contact, the company did not have a means for maintaining accurate records of production line interruptions, and whether operators had been following the SOPs. The manufacturing company sought to improve the visibility of day-to-day operations in order to identify bottlenecks and conduct further analysis to ultimately optimize production efficiency.

Meeting the customer's budget without compromising on AI video analytics

The manufacturer had consulted with another systems integrator that proposed a conventional video server combined with a high-end GPU for conducting analytics. However, the total implementation cost far exceeded the company's budget, and the analytics process was more complex than anticipated. With support from the Intel ecosystem, Rastek ID and Advantech were able to collaboratively deliver a substantially more cost-effective AI-powered solution.

Specializing in innovative AIoT and computer vision solutions, Rastek ID developed AI software based on the manufacturer's requirements and existing facilities. After several months of proof-of-concept (POC) testing, Advantech's AIR-300 Edge AI inference system with VEGA-340 AI acceleration card was selected as the hardware platform for Rastek ID's custom AI software.

In consideration of budgetary restrictions, the AIR-300 system was connected to existing IP cameras, with new cameras only installed at critical workstations for real-time AI-based analysis. The analysis, as well as data



on staff and equipment status, would then be transmitted to the company's backend database. This allows administrators to be notified of abnormal events in real time and take immediate action if required.

Powered by an Intel® Xeon®/Core™ i7 processor, AIR-300 offers high-performance real-time data processing power. The VEGA-340 Movidius™ vision processing unit (VPU) card can be used to accelerate AI by harnessing the host CPU, thereby ensuring scalability for edge applications that necessitate multiple cameras. The AIR-300 system was preloaded with Advantech's Edge AI Suite, which integrates the Intel® OpenVINO™ toolkit. The Intel® OpenVINO™ toolkit allowed Rastek ID to quickly develop custom software and optimize the inference time for computer vision models.

Improving production efficiency and achieving ROI targets

The AI-powered production line monitoring solution has been in operation for approximately six months. Thus far, the time required for video analysis has declined from one month to one or two days, and the staffing requirements have been reduced 10 fold. Furthermore, the manufacturing company had an improved

understanding of staff behaviors, including loitering and not wearing protective gloves or goggles, as well as production issues, such as calibration scheduling and machine status. The analysis reports helped the company identify issues, implement corrective action, and improve production efficiency. The reduced staffing requirements also allowed the factory supervisors to better allocate resources and manage capacity.

During POC testing, Rastek ID and Advantech were able to modify the system features and functionalities according to staff feedback. "It was a long process. But, because this project was the first AI-based project in Indonesia's manufacturing sector, we believe it will become a benchmark for other manufacturers," commented Mr. Sulisty. The manufacturer was confident that their target ROI would be achieved within one year. Accordingly, the company decided to extend the solution to other production sites.

Rastek ID recently reported that two other manufacturers are interested in adopting the same solution for POC testing. This is another reason Advantech is very optimistic about the potential growth of AI applications in Indonesia. ■

Advantech's Solutions and Application Benefits

The AIR-300 with a VEGA-340 card offers high processing power and scalable performance for real-time production line monitoring applications. The Intel® OpenVINO™ toolkit allows system integrators to quickly develop custom solutions and optimize AI performance for computer vision models.

Advantech Partners with Leading EV Charging Solution Supplier to Develop Rapid Chargers

Because of its long-term experience with self-service fuel dispensing equipment and production of rugged SBCs with ESD protection, Advantech was chosen as a solution partner for a leading global supplier of EV charging solutions.

Photos provided by Shutterstock
Interview with Tony An, Sales Director of Advantech Korea

Electric vehicles (EVs) are growing in popularity due to increasing awareness of climate change and carbon emissions, as well as the recent reduction in price. However, the low availability of charging facilities is a significant concern for governments seeking to reduce emissions by promoting EVs. For private businesses, the high costs involved foster reluctance to install EV charging stations.

In South Korea, the Ministry of Economy and Finance has launched several programs

aimed at making EV charging stations more accessible in an effort to achieve net zero emissions from the transportation sector. Accordingly, the government is helping station operators and automobile makers to secure station sites by offering subsidies/tax benefits and regulating the mandatory installation of EV charging infrastructure in new buildings. As the leading supplier of embedded computers for self-service fuel-dispensing equipment in South Korea, Advantech Korea have recognized that the continuing growth of the EV market means the self-service petrol station market will start to decline. Therefore, Advantech Korea decided to seek opportunities for cooperating with major EV charger manufacturers.

Rugged solution with wide operating temperature for critical environments

A leading global supplier of EV charging solutions was seeking a single-board computer (SBC) that complied with government safety regulations. Additionally, to ensure reliable operation in harsh industrial environments, the SBCs needed a rugged design, support for a

wide operating temperature range, and multiple serial ports for integrating additional devices. Moreover, because the EV charging station would be operational 24/7 for a several-year period, local after-sales service and support were another key consideration.

After assessing the options available on the market, the company selected Advantech's MIO-5251 3.5" SBC for its EV rapid chargers because of Advantech's long-established reputation and experience with self-service fuel dispensing equipment. MIO-5251 SBCs support a wide operating temperature range of -40 ~ 85 °C (-40 ~ 185 °F), allowing them to withstand operation in critical environments. In addition to fitting conveniently inside the charger, the MIO-5251 SBC has been streamlined for optimized functionality and features IEC-compliant ESD protection for all COM ports. Furthermore, equipped with three RS-232 ports, up to two RS-485 ports, and two Giga Ethernet ports, MIO-5251 SBCs can be connected to the Internet and devices such as printers, card readers, cameras, and self-service kiosks. MIO-5251 supports multiple display combinations via VGA, HDMI, DP, and LVDS, with mSATA and mini PCIe for easy I/O expansion. For urgent upgrades, MIO-5251 SBCs feature mSATA and mini PCIe to enable easy I/O expansion using the MI/O extension connector.

Sustainable solution with a global service network for international business

According to Tony An, Sales Director at Advantech Korea, charging EVs can take from 20 minutes up to several hours. Thus, the ideal sites for EV charging stations include car parks, motorway service areas, shopping malls, or locations where EVs are likely to be stationary

for at least 30 minutes. Advantech's MIO-5251 is a robust and durable SBC solution for installation at outdoor EV stations. Compliant with most industrial standards, MIO-5251 SBCs have passed reliability tests for rapid-charger projects conducted by renowned car brands in Europe and North America. The inclusion of network connectivity allows real-time data, such as charge completion times and charging bay availability, to be streamed to a centralized command center for monitoring of EV charger metrics.

"Our solution not only met the company's criteria and came with long-term warranty, but we also provided global logistics, a worldwide after-sales service network, and product certification for international exporters. Because MIO-5251 SBCs are a proven solution, the company can easily integrate them into future EV charging devices without re-verification, massively reducing time-to-market," said Mr. An. ■

Advantech's Solutions and Application Benefits

MIO-5251 is a rugged SBC solution for installing at outdoor EV charging stations. Compliant with most industrial standards, MIO-5251 SBCs have passed reliability tests for suitability for rapid-charger projects. The provision of network connectivity allows EV charging station metrics, such as charge completion times and charging bay availability, to be monitored from a centralized command center.



Advantech Industrial Wireless Solutions Help US Healthcare Institutions Boost Patient Medication Safety

In light of smart medical device with wireless capability gaining importance in medical service field, Advantech has served medical community with distinction and proudly introduce wireless solutions to enable reliable and efficient device communication and enhance patient safety.

Photos provided by Advantech
Interview with Alice Liu, Product Manager of Advantech Industrial Wireless Solution (AIW)

Along with the evolution of technology, traditional healthcare environments and medical practices around the world are gradually becoming digital, networked, and intelligent. This not only ensures a more comfortable environment for patients receiving medical treatment, but it also enhances their safety during the treatment process. Development of wireless technologies is making various smart healthcare applications more useful and convenient. For example, in addition to common smart clinics and wards, smart medicine cabinets with wireless technologies have gradually become standard equipment in hospitals, enabling healthcare workers to more accurately administer medication to patients, and allowing administrator to collect medical supply and medicine usage to achieve accurate supply management and cost efficiency.

Wireless solutions becomes an important part of smart healthcare

To ensure patient's safety and cope with mission-critical treatment situations at any time, it is important for hospitals and medical environments to minimize unnecessary cables and wires. This is why wireless solutions have

become a crucial part of complete smart healthcare systems. Alice Liu, Product Manager of Advantech Industrial Wireless Solution (AIW), said, "In mission critical application such as medical treatment, lives are at stake so it's important to get it right." Because healthcare workers handle many patients with varying needs that need to be managed on a regular basis, minimize error causing factors such as accidental wire unplug and ensure critical health data does not become lost is very important.

To ensure the medication safety of patients and help healthcare workers effectively administer medications and manage inventory, smart medicine dispensing systems such as medicine cabinets or carts that communicates via wireless network have become an ideal solution. These systems can be incorporated into an automated medicine management system which can automatically record and track the flow of medicines, assist nurses in retrieving correct medicine and dosage, and help pharmacists with inventory management. These systems can contribute significantly to ensuring medication safety for patients while improving the work efficiency of healthcare workers.



Advantech provides solutions to fasten product time-to-market

Referring to medical equipment providers in the US, Alice Liu pointed out that they adopted Advantech's EWM-W192K1 Wireless Kit solution, a complete package of antennas, related accessories, and a wireless modules, as part of their smart medicine cabinet system.

This not only helps clients reduce the time for designing products and sourcing other raw materials, but it also enables them to quickly complete their product development and enter validation stage. For example, a smart medicine cabinets manufacturer employ EWM-W192K1 wireless kit to enable automated medicine management; another medical equipment manufacturers integrates Advantech's EWM-W192K1 wireless kit solution into surgical room equipment for equipment status and consumable management.

In addition to the medical industry, other markets showing great interest for wireless solutions to supporting smart applications include retail, warehouse management, transportation, smart buildings and environmental monitor. Alice Liu stressed that in order to provide customers with complete wireless solutions, Advantech has set up a dedicated department—Advantech Industrial Wireless Solution (AIW)—offering wireless modules that can support various wireless technologies including Wi-Fi 5/6, 4G LTE, 5G

NR, GPS/GNSS, and Bluetooth. The selections of different wireless technology enables equipment makers to quickly find suitable solutions that support their product designs. It can also significantly reduce the resources needed to enter different geo-regions, given that all related solutions comply with mainstream wireless communication module certification such as CE and FCC.

Advantech believes that with complete selections of wireless solutions, equipment makers and system integrators in growing number of industries can accelerate the development of more products that better meet the needs of smart applications, ensuring the implementation of more effective smart applications in new industries. ■

Advantech's Solutions and Application Benefits

Advantech's wireless kits are designed to meet the needs of various markets, it's including retail, warehouse, transportation, smart city, and environmental monitor. This wireless kit can assist medical equipment makers in developing wirelessly connected smart systems to improve applications. Moreover, it can enhance efficiency, safety, and overall quality of healthcare services.

Intelligent ePaper Bedside Cards Streamline Ward Information Flow in Yeezen Hospital

Yeezen General Hospital in Taiwan adopted Advantech's ePaper solution for its digital bedside cards to help primary healthcare providers complete daily tasks more efficiently. By significantly reducing staff workloads, this solution improves doctor-patient relations and enables the provision of enhanced medical care.

Photos provided by Yeezen Hospital
Interview with Geng-Wang Liao, Vice Superintendent of Yeezen Hospital; Xiang-Fen Lai, Deputy Director of Yeezen Hospital Nursing Department

One of the most important goals of promoting smart solutions in healthcare is reducing staff workloads. With the use of technology, routine procedures and vital tasks can be completed more efficiently. This gives medical staff more

time to focus on patients, improving the quality of care delivered. Moreover, increased digitization allows patients' physiological data to be analyzed for improved healthcare outcomes.

Although the use of smart applications brings several benefits, many challenges must be overcome during the process of implementation. For example, protecting the rights and interests of patients remains a critical consideration for hospitals. Dr. Geng-Wang Liao, Vice Superintendent at Yeezen Hospital stated, "Although the hospital has good intentions in promoting smart development, such implementations must be based on medical expertise and patient safety. Yeezen Hospital's adoption of Advantech's EPD-660 Wireless ePaper Solution Suite to serve as smart bedside cards in VIP wards is an example of how hospitals can benefit from smart healthcare."

A bedside information system that caters to doctors, patients, and their families

"The process of digitization emphasizes present details and general workflow observations.

By adopting this approach when implementing smart systems, primary healthcare providers have been able to reduce daily workloads," explained Ms. Xiang-Fen Lai, Deputy Director of the Nursing Department at Yeezen Hospital. Consider the bedside card ePaper solution, for example, the cards are used to display basic patient information, treatment history, and relevant notes/reminders.

These bedside cards can assist with numerous tasks ranging from traditional form input for digital record-taking to issuing name tags for identity confirmation, as well as notifying medical staff of patients' specific needs.

Previously, when a patient's condition or diagnosis changed, their medical records and paperwork needed to be manually updated or even replaced entirely. This increased the likelihood of data errors and necessitated extra care to avoid misinterpretation and miscommunication. Replacing paper-based administration processes with the implementation of smart bedside cards helped eliminate these problems.

Smart bedside cards display clear and accurate patient information in real time, providing medical staff, patients, and their families with up-to-date information. This improves communication between doctors and patients, as well as

doctors and nursing staff. Ms. Lai reported that both the doctors and patients were very satisfied with the solution once it became operational.

Advantech's wireless ePaper solution accelerates medical service upgrades

Dr. Liao explained, "We chose Advantech to implement smart bedside cards because Advantech is a reliable digitalization partner with more than 10 years of experience in the medical field. This made it easy for Yeezen Hospital to build a patient-centric healthcare environment."

Regarding the reasons for selecting Advantech's ePaper solution, Ms. Lai highlighted the large display area and rapid deployment time. During installation, the solution could be easily connected to an existing wireless network and configured without additional wireless access points, accelerating deployment. Furthermore, the EPD-662 ePaper features an energy-efficient screen without backlight to eliminate environmental disturbances and provide an enhanced healthcare environment. ■



Advantech's Solutions and Application Benefits

Advantech's Wireless ePaper Solution Suite is applicable for smart warehouse and factory, ward/room signs, patient bedside cards, and nursing station signage. This project used Advantech's EPD-662 ePaper solution for patient bedside cards to reduce staffing requirements and medical errors while improving doctor-patient relations.

Advantech Helps Nogata Seiki Accelerate Intelligent Transformation

Nogata Seiki, a Japanese automotive component processing plant, has implemented Advantech's edge-to-cloud smart solutions. With the assistance of systems integrator (SI) Cubeclick, the plant's automatic welding machines were made intelligent, thereby enabling the acquisition of accurate, real-time production data. These solutions have optimized processes and improved overall production efficiency.

Photos provided by Advantech
Interview with Christine Liu, Product Manager of Advantech Embedded-IoT Group; Hiroki Muramasu, PSM of Advantech Japan

As a technological powerhouse, Japan was quick to promote Industry 4.0. Indeed, large, medium, and small manufacturers are embracing the digital transformation and intelligentization of factories. For example, Nogata Seiki in Fukuoka, Japan, is actively realizing a digital transformation by implementing Advantech's easy-to-integrate edge-to-cloud solutions. These solutions have accelerated the company's intelligent transformation in a cost-effective manner.

Utilizing data visualization to improve production and management efficiency

Established in 1967, Nogata Seiki's primary business is vehicle component manufacturing at a traditional metal processing plant. Plant operations rely on personnel recording metrics on paper manually, or downloading production data from PLCs every week and reporting the findings to managers. The purpose of this time-consuming and laborious task is to ascertain the operating status of production lines. However, because production data is not collected in real time, it can be difficult to diagnose problems and take preemptive corrective actions. As a result,

the same problems happen repeatedly.

To remedy the situation, Nogata Seiki collaborated with Advantech and Cubeclick to develop and implement a comprehensive solution. The solution comprised Advantech's EIS-D210 edge intelligence server, AIR-300 edge AI inference system, and VUE-5000 digital signage displays. By incorporating intelligence into their automatic welding machines, Nogata Seiki was able to collect accurate, real-time production data and optimize operations.

According to Christine Liu, Product Manager of Advantech's Embedded-IoT Group, "the EIS-D210 server collects and analyzes PLC data from the automatic welding machines. Data is then uploaded to the AIR-300 edge AI inference system, allowing operators to populate databases, visualize data, and generate reports. The AIR-300 edge AI inference system is integrated with the VUE-5000 digital signage displays to provide a centralized platform for displaying production data. Nogata Seiki's administrators can use the signage display panels to access production information, such as operating status, utilization, and yield rates, and manage all on-site operations."



Hiroki Muramasu, PSM at Advantech Japan added that Nogata Seiki integrated its production data with its human resource management systems and accounting systems in order to improve production efficiency. This gave managers a clear overview of all personnel, machine equipment, and production orders, improving the overall management quality.

Advantech's complete solution empowers Nogata Seiki's intelligent transformation

The Nogata Seiki plant interior is a dusty and difficult place to install cables, which is why ingress protection and wireless connectivity is essential for edge devices. Advantech's EIS-D210 server features a fanless, all-in-one design with excellent ingress protection, and is a preloaded wireless module that does not require cables.

Furthermore, EIS-D210 is equipped with the DeviceOn/iEdge industrial app to allow remote monitoring for reduced maintenance and management workloads. For example, if an automatic welding machine failure or error message is detected, the EIS-D210 server can automatically send a notification to the administrator. This enables the administrator to deploy operators and/or replace parts immediately, reducing the impact on production.

The AIR-300 edge AI inference system offers high-performance computing capabilities. Nogata Seiki can expand its computing and storage capabilities with the inclusion of additional storage and AI modules to handle the exponential growth of data. The company can also use Cubeclick's containerized architecture to transfer production data to a cloud for flexible scalability according to demand.

Ms. Liu emphasized that Advantech provided Nogata Seiki with a comprehensive edge-to-cloud solution. This reduced the integration time, allowing the systems integrator to focus on developments that met the specific needs of Nogata Seiki. Moving forward, Advantech will continue improving its vertical industry solutions in an effort to overcome labor and resource shortages and accelerate the adoption of Industry 4.0. ■

Advantech's Solutions and Application Benefits

Advantech's comprehensive edge-to-cloud solution comprises the EIS-D210 edge intelligence server, AIR-300 edge AI inference system, and VUE-5000 digital signage display. It enables customers to acquire accurate and real-time production data, significantly improving their overall production efficiency.

Advantech's Edge Visualization Solution Improves Digital Signage in Cambodian Shopping Mall

A renowned multinational Japanese retailer implemented Advantech's edge visualization solution at its shopping mall in Cambodia to further digital transformation, improve operations and management, and enhance the customer shopping experience.

Photos provided by Shutterstock
Interview with Steven Chien, Product Manager, Embedded IoT Group of Advantech

In recent years, economic growth and technological advancement have improved the quality of life in Cambodia. New large-scale malls in Phnom Penh offer increased retail space, facilitating the expansion of existing franchises in the country. To cater to current trends and enhance the shopping experience for customers, a well-known Japanese multinational retailer in Cambodia collaborated with Advantech to implement edge visualization solutions in the new Phnom Penh shopping malls. This has contributed to digital transformation efforts aimed at optimizing management and operations, while reducing costs and providing more value-added services to customers.

Comprehensive solution pushes the boundaries of digital signage

The shopping mall in this case study had a traditional digital signage system that could only support one display per signage player. The high number of signage displays required resulted in considerable implementation costs. Furthermore, because the signage system was not connected to the cloud, remote management was not possible, real-time information was



unobtainable, and content management needed to be performed on site.

Overall, their digital signage system required upgrading. After some consideration, the retailer contacted Advantech to provide a comprehensive solution that supported cloud service for their digital signage needs. Steven Chien, Product Manager of Advantech's Embedded IoT Group, reports that Advantech recommended its edge visualization solution with comprehensive cloud-service ecosystem. This solution comprised Advantech's DS-082 and DS-100 signage players, EIS-S230 edge cloud server, and the WISE-PaaS/SignageCMS software platform.

The WISE-PaaS/SignageCMS software platform is designed for remote signage content management and supports multi-view display,

split-screen typesetting, content scheduling, distributed playback, and various file formats. Most importantly, WISE-PaaS/SignageCMS provides cloud management functionality. Meanwhile, the EIS-S230 edge cloud server was preloaded with the SignageCMS server to act as a relay server by automatically synchronizing large audio and video files across enterprise cloud platforms. The EI-S230 server can also be connected to public clouds to support various device management and data processing functions. This allows edge clouds to be rapidly established in usage scenarios that necessitate high stability and security, low-latency processing, and a standard open architecture.

Advantech's DS-082 signage player can support up to 4 x 4K displays for real-time content playback, while the DS-100 signage player can support up to 2 x displays via the Android platform. Mr. Chien noted that both the DS-082 and DS-100 signage players can be integrated with Advantech's wide range of displays. This allows shopping mall administrators to flexibly configure signage systems with specific content according to usage requirements.

Digital signage promotes smart retail development

Advantech's comprehensive edge visualization solution — from software to hardware and edge to cloud — enables a wide range of smart applications for retailers. The signage players used for this project are capable of broadcasting to multiple displays with the multi-screen playback function, enabling retailers to create an interactive multimedia shopping environment.

Moreover, with inclusion of Advantech's SignageCMS software, which supports multi-

view display, various types of media can be presented on a single screen, fulfilling the customer's requirement for display configuration flexibility.

The WISE-PaaS/SignageCMS platform supports content management by providing a comprehensive ecosystem for enterprise cloud platforms to enable remote management and real-time control. This allows administrators to create, edit, and schedule signage content from the company headquarters in Japan or the centralized control room in Cambodia via an EIS-S230 server. Each server supports content broadcasting to up to 30 signage players, which dramatically streamlines the necessary infrastructure. With this easy-to-use intelligent digital signage and content management solution, retailers can transform digital signage into a powerful communication tool for increasing sales and enhancing the customer experience.

Mr. Chien added that Advantech's successful execution of this project will be used as a model for expanding its intelligent digital signage solutions into other Southeast Asian countries. Moving forward, Advantech aims to continue promoting and facilitating digital transformation in countries seeking to implement smart development projects. ■

Advantech's Solutions and Application Benefits

Advantech's edge-to-cloud software and hardware-integrated edge visualization solution is suitable for various retail spaces. The solution enhances customers' shopping experience and helps retailers create superior spaces at minimal maintenance costs while executing precision marketing.

Advantech Assists AUBO Robotics with Building Massage and Physiotherapy Robots

AUBO has partnered with Advantech to create a robot that can provide massage and physiotherapy services in an effort to help physiotherapy centers address human resource shortages and overcome training difficulties.

Photos provided by AUBO Robotics
Interview with Dong Zhang, Chief Operation Officer of AUBO Robotics

With population aging becoming a worldwide reality, caregiver shortages are expected to impact future social care strategies. As it stands, labor force shortages in general are expected to impact all aspects of industrial activity. Accordingly, there is an emerging demand for collaborative robots (so called cobots) that can work with or even directly replace people. A report by ABI Research indicates that the global cobot market will reach US\$8 billion by 2030, presenting massive business opportunities.

Since its establishment in 2010, AUBO Robotics has been dedicated to developing cobots, eventually launching its first-generation collaborative robots in 2013. Thus far, AUBO has developed cobot models to meet the needs of specific industrial applications, such as automotive, hardware, and household appliances, as well as non-industrial applications, such as retail, healthcare, agriculture, and catering.

Physiotherapy chain in China adopts 1,000 cobots

In response to the rapidly emerging demand for collaborative robots in non-industrial sectors, AUBO has been developing various cobots for

use in a range of application scenarios. Among them is a physical therapy massage robot that can help physiotherapy centers reduce human labor. More than 1,000 units have been adopted by a well-known physiotherapy service chain in China.

As pointed out by Dr. Dong Zhang, AUBO's Chief Operation Officer, a considerable amount of time is required to train a physical therapist, and training multiple people at the same time can be problematic. Considering the high staff turnover rates typical of the industry, physiotherapy centers generally have to invest substantial amounts of time and effort on staff training, to the point where this accounts for the majority of their operating costs.



In an effort to address the company's long-standing labor shortage and training cost problems, the physiotherapy chain decided to explore the possibility of employing physiotherapy robots. Consequently, they contacted AUBO and decided to adopt cobots that integrate two of AUBO's key technologies — deep learning-based visual algorithms and force control algorithms. The cobots are also equipped with an Advantech PCM-9310 embedded single-board computer (ESBC) and robotic arm fitted with a physical therapy device.

Dr. Zhang explained that the cobot works by identifying the human body using a 3D vision algorithm and obtaining torque information from the robotic arm using a force control algorithm. The data is then transmitted to the PCM-9310 ESBC (which serves as the brain of the cobot) for processing and analysis to yield intelligent insights and motion commands for the robotic arm. These commands control the amount of force that the robotic arm applies to each body part, enabling it to deliver professional and comfortable massage and physiotherapy services.

Advantech and AUBO collaborate for product innovation

The creation of service robots for physiotherapy marks a new milestone in the collaboration between AUBO and Advantech. Dr. Zhang asserted, "inspired by Advantech's long-standing industrial automation prowess, AUBO has maintained close ties with Advantech over the years." In the past, AUBO worked with other brands. However, the stability, computing power, and safety of their motherboards did not fully meet AUBO's needs. After trialing Advantech's solutions, AUBO found that the PCM-9310 SBC's

small-size, fanless design, low power consumption, and high computing performance met every one of their product requirements. Accordingly, since their launch in 2013, AUBO's cobots have been fitted with Advantech's PCM-9310 industrial motherboards. "To date, Advantech has been the best partner for AUBO in regards to the pursuit of constant growth and innovation," said Dr. Zhang.

Going forward, AUBO will continue to deepen its R&D of core technologies, including algorithms, real-time robotics operating systems, hollow torque servo motors, and driving systems, in order to strengthen its competitiveness and domain expertise. The company also plans to develop a wide range of intelligent robots for a variety of industries, generating new business opportunities. This will help AUBO roll out more advanced robots that deliver superior performance and support specialized functions. While working toward fulfilling these goals, AUBO will continue to cooperate with Advantech in order to bring its robots to new industries and usher in a new era of smart collaborative robots. ■

Advantech's Solutions and Application Benefits

Advantech's embedded industrial motherboards can be installed in diverse equipment, including automobiles, farming machines, manufacturing equipment, and robotic devices. By providing a key solution for vertical industries to realize intelligent computing, Advantech products help people more quickly achieve a smart life as service-oriented robots become increasingly common in the future.

DENSO WAVE and Advantech Offer a User-Centric IoT Data Server to Promote Industry 4.0

DENSO WAVE has utilized Advantech's EPC-T4286 Compact Embedded Computer and created the IoT Data Server, a unique IoT solution dedicated to manufacturing edge computing applications. This solution is aimed at establishing a true IoT system for various types of manufacturing and helping customers embark on their Industry 4.0 journey.

Photos provided by Shutterstock
Interview with DENSO WAVE

Robotics and automation have been used in manufacturing and industrial control systems for decades. Today, driven by the maturity of IoT, big data, and AI technologies, manufacturers can derive insights from data capture and analysis for virtually every aspect of manufacturing. These insights can be leveraged to reduce downtime, improve quality and overall efficiency, increase production capacity, and achieve business goals. Thus, edge computing plays an important role in capturing data, and in some cases it also has a role in preprocessing the data to reduce load on the cloud system.

However, modern factories typically have many components and tools in their automated production lines, including PLCs, DCSs, robots, sensors, machine vision systems, controllers and HMIs. These are also present in facilities not directly related to production, such as electricity meters and air-conditioning systems. DENSO WAVE commented, "due to the lack of Industry 4.0 knowledge and engineering resources, many manufacturers often struggle with figuring out where to start their digital transformation



and determine how to collect data from all their production lines and facilities. Hence, a rugged edge computing solution that can be installed in many types of production environments and process various data types while coping with different cloud server environments can really help them set off on the journey of Industry 4.0."

A one-fits-all IoT data server connecting the edge to the cloud

Leveraging the EPC-T4286, DENSO WAVE developed the IoT Data Server, which is essentially a data integration controller with a built-in dashboard and non-programming data integration software utilities. This user-centric industrial edge computing solution requires only a few simple steps to set up and enable data visualization. It is a true one-fits-all solution that supports

more than 1,000 automated device models with more than 250 communication protocol providers of ORiN. In addition, it can be connected to various types of local servers (e.g., OPC, FTP and Web) as well as mainstream cloud server services (e.g., AWS and Azure). It also has built-in McAfee antivirus software for system and data protection.

The EPC-T4286 not only solved the issues DENSO WAVE encountered with their previous server model, but it also has a small footprint, is lightweight, and features a one-sided I/O panel design that makes for a better installation experience without compromising computing performance. The IoT Data Server's standard data management functions for data collection, processing, storing, event notifications, and reporting can also help users manage and utilize data in various scenes, including anything from production cell systems and production lines to factory networks and clouds. Processing data closer to production lines reduces latency and data transmission costs, makes the system more responsive, and ensures system security and reliability. Thus, the IoT Data Server makes it easy for users to manage automated production lines and other equipment so that everything works smoothly and flawlessly.

A true IoT system that links all automated tools and robots

Originally, the development of the IoT Data Server was intended for DENSO's Factory IoT Project, which was aimed at linking DENSO's 130 automotive parts manufacturing sites around the world. The first system implementation was carried out at one of the sites in Japan. The quality inspection results, production history

analysis, event notifications, and near real-time insights derived from the production lines allowed them to identify the cause of defects, reduce production downtime, and realize nonstop automated production. The overall efficiency rate of the site was raised from 84% to 90%.

DENSO WAVE will continue implementing the IoT Data Server at the rest of DENSO's production sites, help them increase their productivity by 30%, and achieve the goal of being an outstanding factory (DANTOTSU factory). DENSO WAVE emphasized that to establish a true IoT system for various types of manufacturing, it is essential for their solution to support more and more communication protocols used by different automated tools, robots, and many devices used in production. Looking to the future, as DENSO WAVE's core technology is software, the company expects Advantech not only to enhance their hardware lineup constantly, but to also provide long-term warranty, supply continuation, and global after-sale services for its international business, ensuring that the most suitable embedded computers can be applied in different types of production sites around the world. ■



Advantech's Solutions and Application Benefits

Leveraging Advantech's EPC-T4286 Compact Embedded Computer, DENSO WAVE developed the IoT Data Server, a data integration controller with built-in software utilities for creating visualized dashboards and no-code programming. It is a user-centric industrial edge computing solution that requires only a few simple steps to set up and deliver visualized data.

Advantech Forms an Alliance with Freedom Systems to Provide Industrial IoT Operation and Maintenance Services

Advantech has extended its AIoT ecosystem to the IoT cloud solution provider (CSP) sector. To create secure IoT applications from information technology (IT) to operational technology (OT), Freedom Systems is channeling its 20 years of experience with IT services into its role as Advantech's first CSP partner.

Photos provided by Advantech
Interview with Hank Yu, CEO of Freedom Systems

The convergence of IT and OT is necessary for IoT growth. During a digital transformation and/or migration of IoT applications to the cloud, data volumes and security risks increase exponentially. Accordingly, ensuring data security is a key issue for enterprises seeking to implement AIoT applications.

While considering market needs for a comprehensive security solution that bridges IT and OT, Advantech noticed that Freedom Systems possessed high-level IT security service capabilities. Impressed, Advantech invested in Freedom Systems and invited them to become a strategic IoT CSP partner. They plan to co-create industry-focused solutions that can accelerate IoT implementation.

An alliance formed in the spirit of co-creative thinking

Founded in 2002, Freedom Systems has helped hundreds of enterprises deploy digital solutions. They have accumulated extensive experience with IT deployment and information security. Additionally, Freedom Systems recently won Microsoft's 2021 Taiwan Partner of the

Year award, highlighting their prominence in the managed service provider (MSP) sector.

Freedom Systems took the jump from IT to IoT development for their customers. At that time, Advantech believed it was necessary to cooperate with MSPs and leverage their expertise of IT services to exploit industrial IoT applications. If Advantech and its domain-focused systems integrator (DFSI) partners combined their energies to innovate IoT solutions, progress would be amplified and plans for Advantech's IoT ecosystem further refined.

It was for this reason that Advantech reached out to Freedom Systems to discuss the potential for collaboration. Since both parties had a similar vision, an alliance was formed. Starting from 2021, Freedom Systems was not only Advantech's CSP partner, but also played a vital role in promoting digital transformation by assisting Advantech with strengthening its IT security and operations.

Providing IoT operations and maintenance services from IT to OT

According to Mr. Hank Yu, CEO of Freedom

Systems, "Most traditional industrial OT systems have stand-alone operations with little demand for network connectivity. However, when companies try to implement IoT applications, OT personnel generally face challenges related to adequate information security. The IT side may expose the OT side to information security breaches. Recently, hackers have found it more effective and devastating to attack OT systems, causing them to shift focus to exploiting the OT side. Thus, the risks to security for OT systems can no longer be ignored."

Mr. Yu emphasized that enterprises urgently need a comprehensive security solution that covers IT through to OT, either to prevent an IT-based breach that leads to OT data leakage or to avoid direct attacks on the OT side due to insufficient security.

Deploying successful projects in Taiwan to overseas markets

Advantech and Freedom Systems col-

laborated to provide industrial IoT operations and maintenance services to the retail, medical, urban industry, and manufacturing sectors. Mr. Yu cited, as an example, a renowned Taiwanese retail chain that had an IT system maintained by Freedom Systems. But the OT equipment (point-of-service systems) at its stores was maintained by another information service provider, hindering the integration of IT and OT.

However, since learning about the alliance between Freedom Systems and Advantech, the Taiwanese retailer decided to adopt Advantech's UTC point-of-service systems and delegate all operations and maintenance to Freedom Systems. This will enable the retailer to synchronize the IT at the company headquarters with the OT systems at branch stores to create a comprehensive security solution. Looking to the future, Advantech and Freedom Systems plan to continue collaboratively promoting and implementing smart IoT applications around the world. ■



Collaborating with ecosystem partners to share strategic insights

Advantech Connect Online Partner Conference: Edge+ to the Future of AIoT

By Crystal Hsu, Senior Marketing Manager of Advantech Embedded IoT Group

The Advantech Connect Online Partner Conference was our largest online event in 2021. We collaborated with ecosystem partners to share insights regarding the future of AIoT and encourage companies to seize opportunities that advance their business. With “Edge+ to the Future of AIoT” set as the theme for this year’s conference, more than 60 industry experts and ecosystem partners, including Intel, AMD, Arm, NXP, NVIDIA, and Microsoft, were invited to contribute by sharing new Edge+ solutions and innovations in order to shape the next AIoT revolution.

The conference featured six subthemes under the main theme, and comprised more than 50 sessions on topics such as “The Future of the Edge & AI”, “Edge-to-Cloud Transformation”, “Embedded AIoT in Action”, and “Industrial Wireless and 5G Connectivity”. The conference also covered domain-focused topics with sessions

titled “Winning Medical Solutions” and “Make Mission Critical Simple.” Advantech believes that the insights provided by industry experts on how AIoT is driving innovation will inspire participants to greater success in the future.

During the first half of 2021, more than 4,000 customers and partners from various industries worldwide participated in the initial Advantech Connect Online Partner Conference sessions, which included broadcasts of more than 70 videos about specific technologies followed by interactive forums. In the second half of 2021, Advantech’s regional business units continued the global online event by hosting targeted sessions aimed at specific regions. These sessions involved exploring domain-focused Edge+ topics with industry experts and partners in order to increase online engagement, encourage the digital transformation of industry, and promote a sustainable ecosystem driven by co-creation. ■



Advantech IT /OT Total Security

Extended Detection & Response (XDR)

Endpoint Detection & Response (EDR)

- Anti-phishing & malware protection
- Secure email attachments/links
- Device monitoring and management
- Network segregation & protection

- Container and software updates
- Secure device identity protection
- OT behavior analysis & threat detect
- Ransomware protection & recovery
- OoB protection & recovery



Comprehensive Cybersecurity Solution

The average ransomware paid in 2021 surged to USD 570K reaching 171% YoY. As more and more critical infrastructures feature IoT connectivity, every single one of these endpoints also represents a potential access point for malicious hackers.

Advantech IT/OT total security provides edge-to-cloud security by integrating multiple Microsoft Azure security services, Acronis backup, and McAfee white-listing to comprehensively protect your vital data. This concise solution covers everything from prevention, detection, action, and recovery.

[Learn more](#)



[Whitepaper download](#)



Enabling an Intelligent and Sustainable Planet



ADVANTECH

Enabling an Intelligent Planet

Advantech's hardware, software, I.Apps, and integration solutions consist of various products designed for specific applications, such as in energy (solar energy, wind energy, smart grids, electric vehicle charging stations, building energy-saving, and energy-saving monitors), flood and disaster prevention, sewage treatment, remote education, public safety (smart street lighting, transportation safety), public health, telemedicine, smart medicine, cold chain management (food safety), smart agriculture, information security, and cloud computing. In 2020, our worldwide revenue for the sale of products used for sustainable purposes accounted for 15.79% of our total revenue.

In the future, we aim to incorporate sustainability concepts into our strategy blueprint for developing new products in different industries. We will continue to develop smart solution plans to make the world cleaner, safer, healthier, and more convenient, enabling an intelligent and sustainable planet.

