

My WISE-PaaS

An Advantech Magazine- Energy Issue 2020

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Achieving Carbon Reduction Goals through Smart Technology



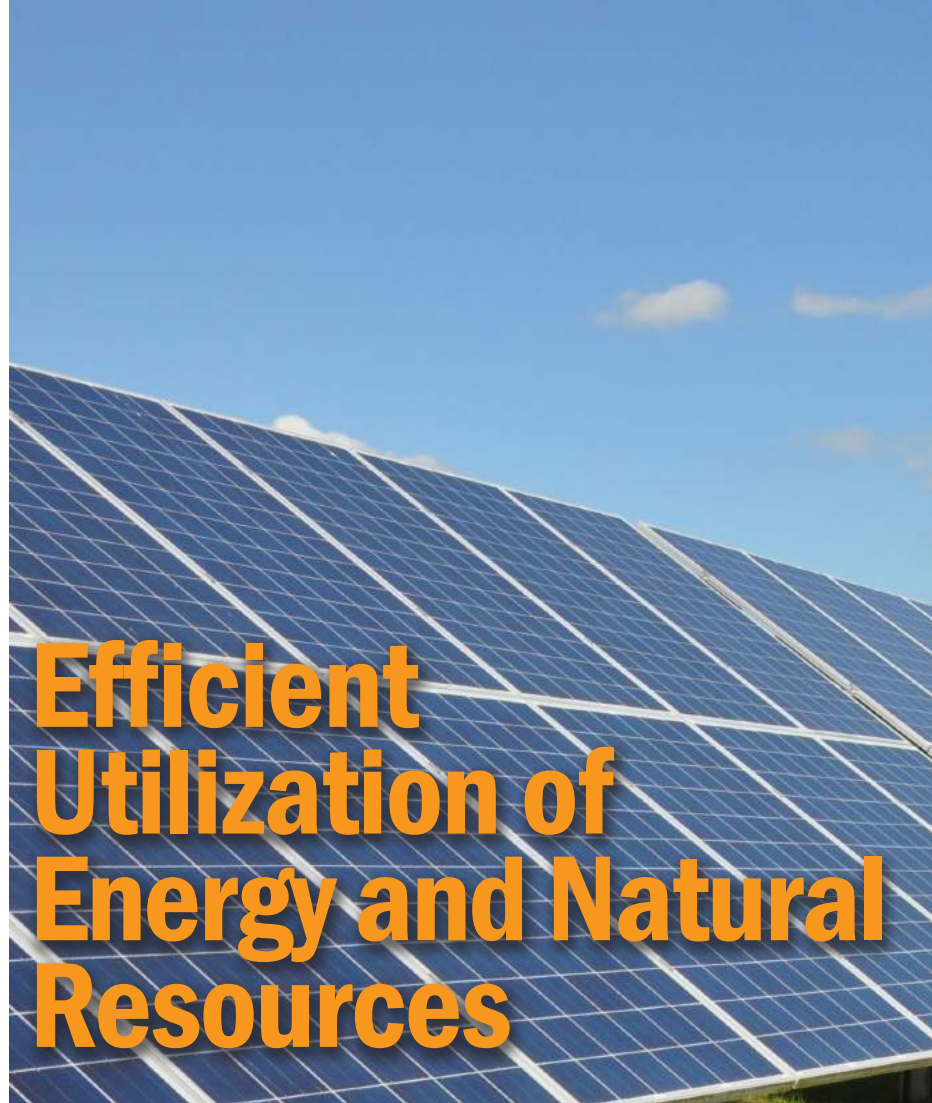
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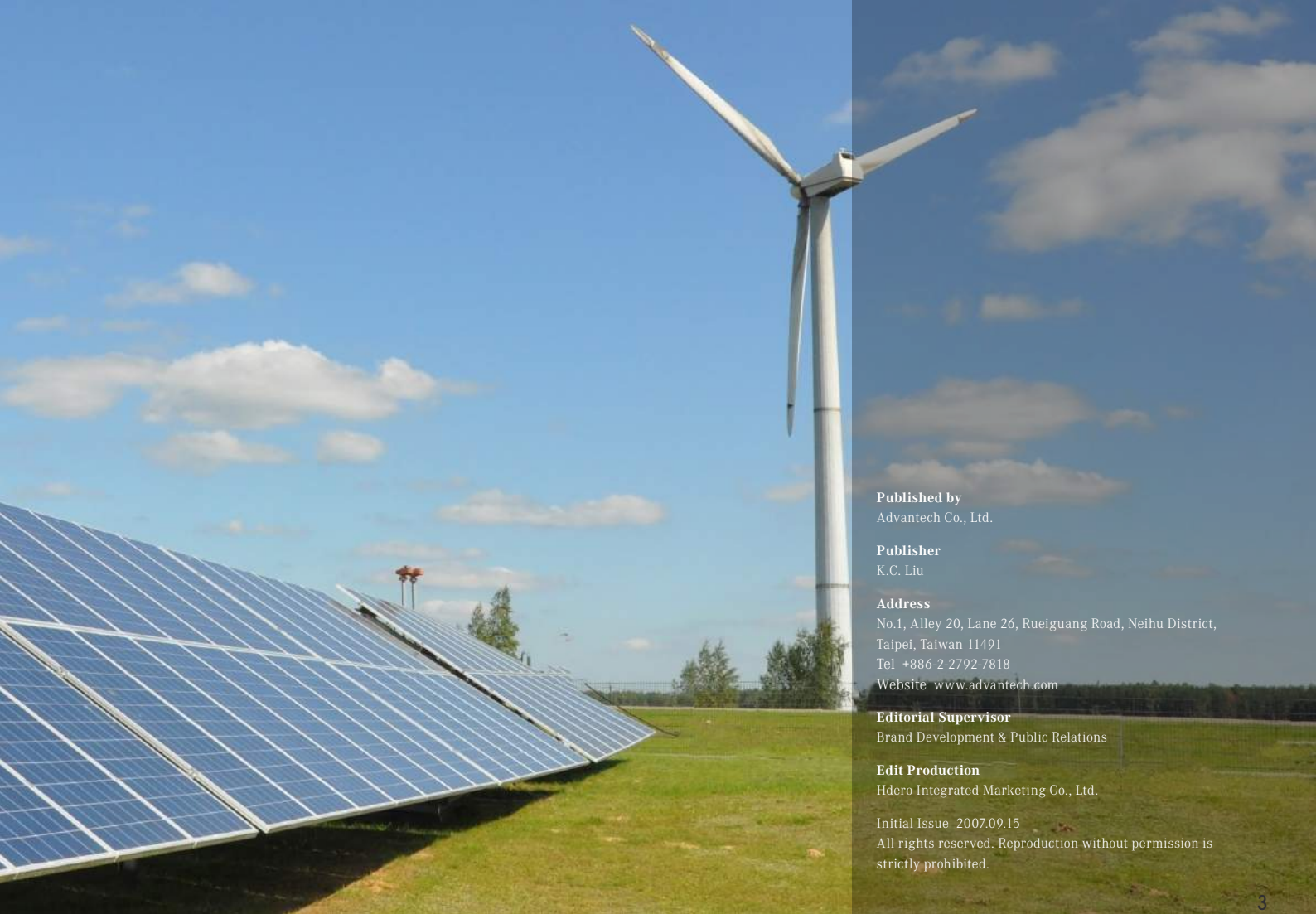
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Industrial IoT Cloud-Based Monitoring & Operating Platform

Building a Unified Real-Time Management Platform Through Rapid Adaptability to WISE-PaaS



WISE-PaaS/WISE.M+

Cloud Service Powered by WISE-PaaS

ADVANTECH

Enabling an Intelligent Planet

Why WISE-PaaS/WISE.M+?

WISE-PaaS/WISE.M+ is an open cloud-based industrial IoT platform that aims for real-time monitoring and optimized operations management to provide smart equipment management that helps businesses enjoy IoT success. Advantech developed WISE-PaaS/WISE.M+ services to facilitate deployment, configuration, and direct access to these equipment to improve overall performance and efficiency and enable seamless business digital transformation.

Efficient User Management

- Adopt microservices instantaneously via a single portal
- Unified platform for all users to simplify service configuration
- User authentication management with respect to organization's hierarchy

Selective Dashboard Offerings

- Multiple domain dashboard templates for efficient real-time monitoring
- Step-by-step dashboard wizard
- Build domain-focused environment based on microservices for different professional fields

Advanced Equipment Management

- Plug and Play connection through profile management
- Direct configuration of alarm and event via graphical user interface
- Hierarchical organization management of devices, equipment, machines, or assets

Accelerating Business Development

- Real-time notifications allow owners to respond promptly and precisely
- Visualized trend and data analysis leads to preemptive management
- Simple as Building Blocks: Integrate domain-focused microservices to expand your business



Smart Energy and Environmental Management: Toward a Sustainable Planet

The importance of environmental sustainability has been recognized around the world. In line with this global consensus, IoT, big data, edge intelligence and cloud computing technologies are being integrated in devices and equipment for real-time and remote smart monitoring.

For example, IoT applications have become very popular in such areas as smart energy and environmental (E&E) management.

The main topic of the current issue of My WISE-PaaS is therefore E&E, so as to show governments and industries the versatility of IoT applications in smart E&E as well as the success that has been achieved in implementing such applications.

With detailed explanations by Advantech's Associate Vice President of E&E and external experts, readers will be able to gain a much better understanding of smart E&E applications.

In the Power Insight section of this issue, Ming-Shan Jeng, Section Chief of the Green Energy and Environment Research Laboratories of the Industrial Technology Research Institute (ITRI), points out that among the methods to reduce emissions of carbon dioxide, energy conservation can contribute 40% to emission reductions, more than the 37% contributed by the use of green energy sources. This shows that energy conservation is currently the most important approach in mitigating the planet's rising temperatures. The use of IoT technology offers the best prospects for smart energy conservation.

This issue also features eight insightful cases concerning smart applications in global environmental sustainability. Thermo Fisher Scientific and Advantech collaborated in the realization of sustainable smart VOC management.

A technology solution developed by Intelligent Cloud Plus and Advantech for Dubai Al Maktoum International Airport offers real-time monitoring to effectively reduce energy consumption and operational costs in a smart manner. And AIWater utilized Advantech's water and wastewater management SRP to develop smart algorithm software. All these cases highlight the smart technologies and innovative applications that are being adopted in the E&E sector.

In accordance with the trend of utilizing smart technology toward environmental sustainability, Advantech actively promotes the concept of co-creation, connecting partners around the world to promote the development of a more intelligent planet. In the Customer Partnership section, there is a story about the smart city solution provider HwaCom Systems, which is using Advantech's WISE-PaaS platform as the basis to develop solutions that deliver instant and efficient smart management for industrial zones, helping reduce pollution and minimize the occurrence of disasters and creating a better environment for people working in such zones.

However, IoT applications in the E&E sector suffer from fragmentation. Overcoming challenges of integration requires close collaboration between relevant partners.

Advantech therefore initiated the co-creation model, providing platform resources and making investments to form close partnerships with system integrators to realize the mission of enabling an intelligent planet.

Advantech will continue to collaborate with its partners to co-create even more smart applications, so as to make the world a better place for all people. ■

Advantech Helps SIs Transform into DFSIs, so as to Collaborate on Co-Creation for an Intelligent Planet

Due to a lack of remote monitoring mechanisms in traditional energy and environment (E&E) sectors, system abnormalities and malfunctions often go unnoticed. Resulting in extremely low usage rates and frequent disposal of related equipment. Therefore, Advantech has leveraged industrial IoT to develop the WISE-PaaS and WISE-PaaS/WISE.M+ platforms. In an effort, to help system integrators (SI) accelerate the creation of solutions for smart E&E management that integrate both software and hardware. Thus, contribute to resolving energy shortages and environmental pollution.

Interview with Ching-Po Lin, Associate Vice President, Industrial IoT Group, Advantech

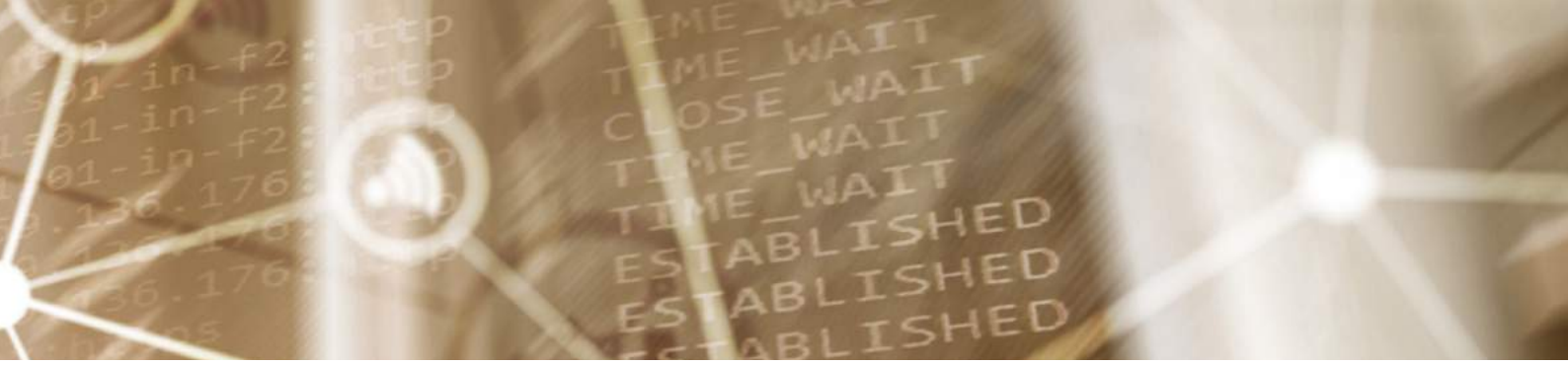
With many disasters around the world stemming from abnormal weather patterns, issues associated with energy shortages and environmental sustainability are of great concern worldwide. Countries are investing tremendous resources in sustainable energy and infrastructure, including wind power, solar power, and wastewater treatment.

“Countless facilities have been built, but usage rates are not high,” said Ching-Po Lin, Associate Vice President of Industrial IoT Group, Advantech. “Although such facilities are equipped with advanced hardware, the lack of remote monitoring mechanisms makes them susceptible to even minor disturbances, lowering efficiency or even halting operations.”

Collaboration with SIs for rapid development and replication of industrial applications

To assist E&E facilities in cities with the transformation from traditional management to optimized operational services; Advantech capitalized on its 30 years of experience in hardware technology to launch the IoT cloud platform WISE-PaaS in 2014. Allowing SIs to utilize various technological components on the platform to easily integrate data in the cloud and create innovative service models.

In an effort over the past year to speed up the development of IoT solutions, Advantech used the WISE-PaaS platform as the basis for the concept of industrial applications. According to Lin, “SIs require strong IT capabilities with regard to data pre-processing and data analysis to



develop industrial applications on WISE-PaaS. Smaller SIs, however, may not be able to do so due to a lack of development resources.

Advantech therefore also introduced the WISE-PaaS/WISE.M* platform on WISE-PaaS.”

Lin used the E&E sector as an example to elaborate on application development. Because of the vast scope of this sector, professional knowledge and application demand vary by sub-sector. SIs need considerable time to develop E&E IoT applications on the WISE-PaaS platform. In consideration of this, Advantech has differentiated between “Common I.APP” and “Domain I.APP”—general applications useful to the entire sector and specialized applications for specific sub-sectors. This allows SIs to quickly replicate IoT applications based on customer demands and accelerate the realization of smart E&E in cities around the world.

WISE.M* is an industrial application management platform that is able to conduct digital replication and pre-process vast amounts of data. On the platform, Advantech works with SIs to create industrial applications that can be divided and refactored. Therefore, making it easier to replicate completed smart applications from one domain to another.

With the launch of WISE.M*, Advantech also updated the traditional graphics control software WebAccess/SCADA into an industry 4.0 docking platform; boasting optimized interfaces, 3D configurators, and enhanced data acquisition. In addition, it allows SCADA to not only acquire data from PLCs but also collect IT system data related to ERP, helping administrators make smarter decisions.

Accelerating the cultivation of E&E co-creation partners

According to Lin, the same core concept applies to both WISE-PaaS and WISE-PaaS/WISE.M*, i.e. Advantech handles complex tasks such as data acquisition, pre-processing, conditioning and visualization. While SIs develop corresponding smart service procedures according to industry trends to complete the development of IoT cloud monitoring solutions. SIs are thus able to focus on the innovation of optimized operational services and the creation of smart IoT applications. Advantech’s concept of co-creation was formulated as a response to the challenge of how to successfully promote innovative applications developed by partner SIs around the world.

Advantech proposed this concept at the end of 2018, with the purpose of helping SIs transform into domain-focused solution integrators (DFSIs) through comprehensive collaboration from product development, from sales to marketing. This not only enables SIs to expand their IoT smart applications into overseas markets, but also accelerate the realization of Advantech’s mission to enable an intelligent planet. Successful projects have already been conducted in the field of E&E.

In closing, Lin stated that he was always deeply touched when a project has proven to be beneficial to the environment with the help of technology. Looking ahead, he stressed that, “Advantech will continue to cultivate DFSI partners in Asia’s E&E sector based on the co-creation model. In an effort, to increase the pace of innovation in E&E operational management, create profitable business opportunities, and make the world a more beautiful place.” ■



Achieving Carbon Reduction Goals through Smart Technology

In response to global warming, the Green Energy and Environment Research Laboratories of Taiwan's Industrial Technology Research Institute (ITRI) has spared no effort in developing energy-saving technology. They are leveraging up- and downstream industry resources to foster innovative and smart applications across Taiwan. These applications are now also being exported to overseas markets.

**Photos provided by Industrial Technology Research Institute
Interview with Ming-Shan Jeng, Division Director at the Green Energy and Environment Research Laboratories,
Industrial Technology Research Institute**

As global warming has become more severe, the importance of saving energy and reducing carbon dioxide emissions has been recognized worldwide. Countries are trying to achieve carbon reduction goals by developing new types of energy, cultivating various energy conservation methods, and promoting carbon capture and storage. Ming-Shan Jeng, Division Director at the Green Energy and Environment Research Laboratories, pointed out that according to the International Energy Agency, among the three aforementioned approaches; energy conservation can make a 40% contribution to carbon reductions, higher than the 37% contributed by green energy sources. This shows that energy conservation is currently the most important approach in mitigating the planet's rising temperatures. And the use of IoT technology for smart energy conservation offers the best prospects moving forward in this regard.

Smart electricity-saving applications in industry and commerce

With regard to energy consumption in industry, commerce and the residential sector, Jeng explained that industry accounts for the highest share of electricity use in Taiwan. Hence, the urgent need for industry to adopt smart electricity-

saving applications. Yet complex manufacturing environments have made it difficult to do so, and adoption rates have been fairly low. Meanwhile, even though smart energy conservation can be easily applied in the residential sector, low electricity fees in Taiwan has also led to low adoption rates in this sector. In commerce, however, AIoT has been used for quite some time to conserve energy, as it is more readily applied than in industrial environments and generates clear efficiency benefits. Supermarkets and convenience stores, among others, have been early adopters.

For instance, ten years ago, the Green Energy and Environment Research Laboratories helped a domestic chain of convenience stores establish smart electricity-saving applications. Which have already evolved into fourth-generation IoT systems. In addition, to automatically adjusting air-conditioning temperatures, these systems also provide smart control of refrigerators. By measuring the temperatures at air outlets of refrigerators, they can determine what adjustments need to be made to reach the most appropriate temperature. Safeguarding the quality of refrigerated products and conserving electricity.

Despite the difficulties in implementing smart

electricity saving in industry, the society-wide consensus on the need for carbon reductions has led to a gradual increase in the adoption of electricity-saving applications in manufacturing operations. For instance, the Green Energy and Environment Research Laboratories previously assisted a textile factory with creating a smart electricity-saving system. Which used various sensors to collect data on temperature and humidity levels and leveraged machine learning to automatically control these levels. Helping reduce electricity use by 15%, the system was also able to adjust manufacturing parameters in accordance with the type of raw materials being used in the factory, thereby raising the quality of end-products.

Taiwanese smart energy-saving applications expanding to overseas markets

The many different aspects involved in smart energy saving make it impossible for a single entity such as the Green Energy and Environment Research Laboratories to create smart applications for various fields. A wide range of resources and capabilities must be integrated. Thus, the Laboratories has consistently sought to connect with companies from up-, mid- and downstream industry sectors. Upstream electricity meter, sensor and communication module manufacturers, as well as Advantech, which offers IoT solutions and platform services, are key partners of ITRI.

Based on achievements made in Taiwan, as well as the integration of up-, mid- and downstream vendors, the Green Energy and Environment Research Laboratories has actively led the industry over the past year in developing overseas markets such as the Philippines and Thailand. Jeng stated that ITRI, by taking advantage of the hardware, software and system integration capabilities of Taiwanese companies, has already helped convenience stores in the Philippines and supermarkets in Thailand adopt smart energy-saving applications.

Looking ahead, Jeng said he firmly believed many more innovative smart energy-saving applications would emerge as AIoT technology

becomes more mature. Moreover, once the green energy sector matures further, smart energy saving will move beyond single smart electrical grids to a comprehensive interconnected system of such grids. Each grid controlled by smart management systems that can make decisions as to whether electricity should be stored or whether surplus electricity should be sold to others.

It is of course insufficient to rely on technology alone; people's awareness of the importance of saving energy must serve as the foundation of any meaningful endeavor. Jeng pointedly said that 30 years ago, when he started working at ITRI, carbon dioxide level on Earth was only at 350 parts per million (ppm), but that today it has exceeded 400 ppm. People now clearly understand that if the rise in temperatures is not halted, a catastrophe will arise. Nevertheless, current efforts to bolster energy saving and reduce carbon emissions are still not enough. Everyone must chip in to help realize a sustainable planet. ■





Thermo Fisher Scientific and Advantech Collaborate in the Realization of Sustainable Smart VOCs Management

In response to China's increasing stringent environmental regulations, Thermo Fisher Scientific launched Smart VOCs Gas Detector based on Advantech's VOCs Smart Monitoring Solution to assist Chinese factories in smart pollution management to avoid the violation of environmental regulations and pursuit for a more sustainable earth.

Photos provided by Fotolia
Interviewed with Teyu.Hung, Sr. System Engineer, Thermo Fisher

China is making headway with the international standards of the environmental protection policy and has ensured stringent monitoring on its industrial pollution emission. For instance, the monitoring of VOC (Volatile Organic Compound) to prevent data falsification. When VOCs emission exceeds the limit, enterprises will

receive a huge fine as a penalty. Which has influenced the industries need to smart monitoring solutions to accurately collect and analyze the emission data.

Building VOCs smart monitoring solution

To meet the market demands for environmental

protection and pollution prevention in China; Thermo Fisher Scientific, the world's leading manufacturer in the scientific service field has to launch an intelligent VOCs gas detector. Therefore, they needed a miniaturized VOCs data uploader with a distributed collection solution. This will collect accurate data in real-time and a visualized monitoring platform. It will be equipped with features of the collection, management, communication, and analysis to prevent the issue of data falsification.

More specifically, the VOCs Gas Detector is equipped with Advantech's VOCs Smart Monitoring Solution, with sensors embedded to collect temperature, pressure, humidity, moisture, and dust data of the volatile gases in real-time. After processing the analysis in the VOCs Analyzer, Advantech's ADAM-5000/TCP Distributed DA&C System for Ethernet will conduct the data acquisition and storage. Then the data is integrated by WebAccess/SCADA and uploaded to WISE-PaaS or a unified monitoring platform of the government Environmental Protection Department.

Collaboration with Advantech brings 3 major benefits

Through Advantech's VOCs Smart Monitoring Solution, Thermo Fisher Scientific gained 3 major benefits; the realization of optimization, ease of management, and cost-saving construction when providing smart monitoring services for customers.

First of all, Advantech's Smart Monitoring Solution provides single-point and multi-point collection monitoring solution.

This allows Thermo Fisher Scientific to adopt appropriate solutions to optimize the configuration according to customer needs and greatly reduce the cost of constructing smart monitoring applications.

Additionally, through the built-in software of Advantech's WebAccess, the pre-configured parameters, operational status of the gas monitoring system, and the change of gas concentration can be visualized and observed in real-time. The data will be automatically converted and saved in the database. WebAccess's 100% web-based configuration software allows administrators to have real-time cross-platform monitoring; of the status through smartphones, tablets, PCs, or any smart devices. This allows users to have total control over the situation at their fingertips.

Moreover, the features provided by Advantech's ADAM-5000/TCP could significantly reduce the cost of

construction. For instance, the high density and large capacity I/O could save space. Multiple data acquisition modules sharing the same power supply can save implementation cost. Ethernet ports that support daisy chain connectivity saves cost on network switches. More importantly, ADAM-5000/TCP could work stably in a harsh environment. The characteristics of high-precision analog acquisition allow flexible correspondence; to lower-end data acquisition modules and upper-end environmental data acquisition instruments and equipment to establish a unified and integrated monitoring platform. This greatly improves the efficiency for maintenance and reduces the cost of software development for implementing smart applications.

In general, the collaboration of VOCs Smart Monitoring Solution between Thermo Fisher Scientific and Advantech could have the precise monitoring in real-time with data pushed to several administrators simultaneously. Which, greatly improves the efficiency of the environmental protection managing department. This allows factories to avoid loopholes and huge fines for exceeding the regulated limits. This advanced smart monitoring solution has currently been applied to various fields of continuous monitoring of atmospheric pollutant emission, including petrochemicals, painting and coating, leather processing, tire manufacturing, automotive paints, and pharmaceuticals. ■





AIWater Utilizes Advantech's Solution Ready Package (SRP) to Achieve Smart Wastewater Treatment

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To effectively assist wastewater treatment plants, AIWater utilized Advantech's water and wastewater management SRP to develop smart algorithm software. This type of solution has already shown success in the Rende Industrial Area in Tainan, Taiwan, where it recycles wastewater to be used again.

**Photos provided by Advantech
Interviewed with Dr. Wayne Lo, CTO, AIWater**

Recycling industrial wastewater and properly processing and purifying it can greatly contribute to enhancing environmental protection and preventing water shortages.

However, industrial wastewater treatment is complicated and requires numerous procedures, one of which is a filtration process through a membrane. After long-term usage, the membrane becomes clogged with debris and requires cleaning with chemicals.

The traditional cleaning process of the membrane takes considerable time and resources, and the difficulty in properly assessing the condition of the clogged membrane can result in premature or overdue cleaning,

which in turn will cause unsatisfactory results and affect the filtration function of the membrane afterwards.

To solve this issue, AIWater, a company specialized in the management of industrial wastewater and residential sewage treatment, utilized Advantech's water and wastewater management SRP as the basis to develop smart algorithm software to calculate the optimal schedule for membrane cleaning. The algorithm is used to monitor the clogging of the membrane and formulate a standard operating procedure that ensures cleaning is done at ideal times.

This has resolved current problems with filtration. In the Rende Industrial Area in Tainan, Taiwan, this

solution has already been implemented in a wastewater treatment plant with great success.

Developing smart applications based on Advantech's SRP

The process of industrial wastewater treatment is very intricate; it can only be purified to tap water standards through biological, sand, bag, ultra, and nano filtration. Among these, AIWater focuses on nano filtration and uses an algorithm that accounts for each phase of the filtration process and the water flux.

The algorithm then forecasts future trends while considering water loss during cleaning, so as to come up with a precise time for cleaning.

The algorithm must monitor and collect real-time data of the filtration devices in the treatment plant, sending timely notifications via a cloud platform to related personnel when issues arise. A command center and a complete solution with integrated software and hardware are needed to monitor the system and the status of the membranes. Advantech's SRP for wastewater treatment consisting of the ECU-1251 (an industrial communication gateway with built-in protocol conversion software WISE-PaaS/EdgeLink), the HPC-7242 (a server with built-in remote monitoring software WebAccess/SCADA), WISE-PaaS/EnSaaS (an IoT cloud platform), and WISE-PaaS/WISE.M* (an IoT cloud management platform) offers the best possible solution.

Solution with integrated software and hardware satisfies SI demand for fast development

The ECU-1251 installed at the wastewater treatment plant in Tainan is a robust product capable of operating across a wide range of temperatures. It can be installed in outdoor locations, basements, wastewater treatment facilities, or any other harsh environment. It also supports a variety of PLC communication protocols and can easily retrieve data from all devices operating in the plant. The HPC-7242 is a high-end server equipped with a powerful CPU and GPU to achieve the advanced computation required to run the AI-driven algorithm.

The application developed by AIWater retrieves filtration data from the cloud platform's database and visualizes it on the display screen in the command center for real-time monitoring. At the scheduled time for optimal cleaning, provided by the AI-driven algorithm, the PLC cleans the filtration membranes based on the

commands issued by the system via the cloud platform. In the event of abnormalities during the cleaning process, the command center receives a real-time warning message and the system sends a notification to mobile devices of related personnel, which allows for prompt assessments and the formulation of countermeasures.

Advantech's IoT cloud management service, WISE-PaaS/WISE.M*, offers highly applicable templates for wastewater treatment.

Users can fine-tune and configure any of the templates to produce a monitoring display for filtration membranes without the need to design one from scratch, perform drag-and-drop operations, and define related parameters, which improves the efficiency of projects.

Advantech's water and wastewater management SRP is an AIOT cloud application that serves as a robust foundation allowing AIWater to focus on its own specialty of AI software development. By leveraging the SRP, which saves time and effort and facilitates secondary development, AIWater has created software programs for biological treatment, coagulation/precipitation, electro dialysis reversal (EDR) processing, and water quality monitoring, in addition to the project at the Rende wastewater treatment plant. AIWater, which serves as both an SI and managed service provider (MSP), is therefore able to manage multiple projects for various wastewater treatment plants simultaneously and provide complete managed services to customers. ■





HITI Industrial Automation Built an Intelligent Energy Management System for a Plastic Materials Factory

Advantech's Factory Energy Management Solution (FEMS) enabled HITI Industrial Automation to integrate multiple existing systems in the factory to achieve centralized power monitoring and management, while avoiding surplus electricity penalty charges for exceeding contract capacity.

Photos provided by HITI
Interviewed with Kuo-Yu Hsu, General Manager, HITI Industrial Automation

Any industrial power users in Taiwan who have signed a fixed capacity contract with Taiwan Power Company are likely to suffer paying these excess surcharges—unless they sign a higher capacity contract. The main reason is that Taiwan Power Company does not use the Pay-as-you-Go method of charging. If users don't keep an eye on all electrical equipment in the factory, slight overuse will result in penalties.

With this in mind, Kuo-Yu Hsu, General Manager of HITI Industrial Automation said, "Relying on manpower to supervise electricity consumption is a very laborious and inaccurate management model. The most feasible

method should be to introduce a remote power monitoring system that uses IT technology to monitor every minute and every second as well as sending out alerts in real time should there be a risk of overuse. Distributing power like this can prevent sudden increased demands during certain periods and prevent over capacity issues that incur surcharges."

Integrating independent systems for centralized monitoring

Kuo-Yu Hsu, who has provided IT and OT integration solutions for production lines and factory facilities in

various industries, takes a plastics and rubber materials manufacturing factory as an example to illustrate how HITI Industrial Automation assisted the customer to solve their problem through the careful application of an intelligent IoT platform with highly integrated and centralized management.

The plastics materials factory had four systems related to power management. However, the factory still often received penalty charges since its order volume varied every month. The reason for this is that the four systems operate independently and store data in paper form. Therefore, the distinction between electricity analysis and usage was difficult to understand. Moreover, the four systems are scattered throughout the factory and lack centralized monitoring and management.

HITI Industrial Automation used Advantech's FEMS Solution Ready Package (SRP) to build an intelligent power management platform for the factory. The solution integrated the existing four independent operating systems to obtain power consumption data. This allowed managers to fully grasp power consumption and distribution across the factory through the analysis functions of FEMS SRP, which also allowed emergency reaction to unforeseen events.

Kuo-Yu Hsu said, "Factory managers had no idea how their electricity was used in the past, but now they can understand clearly. The early warning functions of the new platform also helped them to avoid over-consumption of electricity." Managers also benefited greatly from the long-term recording of power usage to help them calculate accurate capacity, enabling the factory to avoid paying high penalties.

Highly integrated SRP designed for energy management applications

Kuo-Yu Hsu explained, "This project contains a variety of equipment, making its communication protocols more complicated for connectivity. Therefore, a highly integrated platform was a necessity so that it could integrate multiple power systems that originally generated data for different purposes."

Advantech's FEMS SRP features software and hardware integration designed specifically for factory energy management applications. Advantech provided embedded computers WA-SU2483 and WA-SU2473 with built-in WebAccess/SCADA software as the gateway used to collect the factory's existing data. Network

switches EKI-5526I/EKI-5528I which were responsible for uploading data. A server-grade HPC-7242 with built-in FEMS software to be used as the factory energy management host for receiving data from the bottom layers. Two embedded computers which was responsible for displaying electricity data consumption on a large TV wall, and for transmitting data to the factory's existing cloud management system.

The FEMS SRP provided many useful functions such as collection, analysis, integration, visualization, warning and automatic report generation for factory electricity information management. According to Kuo-Yu Hsu, "We can control it directly through the settings. There is no need to write programs from scratch. This easy-to-learn and easy-to-use feature really helps us save time on secondary development".

Kuo-Yu Hsu also realized that the cooperation with Advantech would bring additional benefits. He said, "Providing customers with comprehensive integration services is our business goal. As a VIP member of Advantech WISE-PaaS Alliance, HITI Industrial Automation can obtain cost-effective products, complete technical support and extensive marketing resources, which help us to integrate our company's products and promote a total solution. Therefore, in addition to the FEMS SRP for this project, we would continue to cooperate with Advantech on other IoT application areas such as OEE capacity management, situation room, intelligent environment monitoring, and intelligent equipment networking."

Intelligent platform optimizes factory energy management

Of course, manufacturers always want to pay less for their electricity.

They usually consider their utility provider with great care and were very thoughtful of each detail before signing a contract with Taiwan Power Company.

Most of the factory managers were also very careful about reducing or increasing the contract capacity, and this highlights the necessity of establishing remote power monitoring and management.

After implementing the FEMS SRP solution by HITI Industrial Automation and Advantech, instant power usage data display enabled the factory to quickly improve their electricity management efficiency and better handle emergency situations. ■



Sunforce Builds a Cloud-Based System for Monitoring Outdoor Cornfields

Sunforce achieved synergy with Advantech's hardware and software solutions in creating a cloud based system for monitoring corn fields—transforming corn cultivation into a technology-aided industry that yields high-quality, value-added crops.

Photos provided by Shutterstock
Interview with Frank Lo, CEO, Sunforce Technologies

Perhaps you have acquired vacuum-packaged corn at a supermarket. What you may not know about these corn products is that they have secured a foothold in Taiwan's instant food market and are now served in diners across the globe.

Their satisfying shiny paper-thin appearance and a juicy sweet taste. This type of corn provides ample business opportunities for agricultural product marketing

firms. Their popularity shouldn't be a mystery; the corn is grown from Taiwanese farmers who increasingly use information communications technologies, the Internet of Things (IoT), and big data analytics to guarantee quality and maximize yields.

An example of these three technologies working seamlessly together to aid in corn cultivation can be seen with Sunforce Technologies. Frank Lo, the company's



CEO, says that scientific management approaches are being used to precisely track growth and cropland environmental conditions. This is reshaping conventional farming practices and playing a growing role in monitoring expansive farm fields.

Technology makes cornfields easier to manage

Specializing in intelligent monitoring and system integration. Sunforce has been a solutions provider for data centers and intelligent factories since its founding. Over the past five years, they has been working in the field of intelligent agriculture to tackle a persistent issue facing the Taiwanese agricultural sector: the aging and shrinking of the workforce. As pointed out by Mr. Lo, is making it difficult for prevailing management models that depend on weather conditions and veteran experiences.

That improves existing cultivation techniques and crop quality. While drawing in younger workers and enhancing global crop competitiveness.

The development of intelligent agriculture offers an answer to this challenge, giving traditional agriculture a new lease on life.

Sunforce worked with a corn farming contractor to put in place a cloud-based monitoring system, for cornfields in a dozen contracted farms across three towns: Huwei in Yunlin Country, Yuanchang and Yizhu in Chaiyi County. This cloud platform displayed data on key factors influencing corn growth. This includes the temperature, humidity, sunlight, moisture, and soil conditions. Thus, eliminating the need to check up on the fields in person.

The platform also collected data for measurements related to soils and weather, on-site work logs, and aerial images. It then saved this data for analysis, diagnostics, and early warning generation. The data was helpful to the contractor in improving corn yields and quality. It shed light on how corn grew under differing planting conditions (e.g., leaf temperatures, sunlight, cumulative temperature, electric conductivity, temperatures, and moisture levels of soils). Sunforce also provided aid in designing an algorithm for applying fertilizer at proper time. A module for controlling the cloud database, for informing decisions on corn growing, and provided a large pool of planting-related information needed to automate corn cultivation management.

“Agricultural management models that harness technologies and public clouds can be a real boon for farmers,” says Mr. Lo. “Farmers can log into our cloud platform via a mobile app to retrieve the photos of their cornfields and the data about the fields’ environs.” This technology-driven solution for managing crops can reduce the daily need to patrol fields, expedite cropland management, and allow cultivation experiences to be quantified and taught.

Software and hardware integrated cloud solution

The remote cornfield monitoring system, developed by Sunforce, uses some of Advantech’s hardware and software products: ADAM-3600 (an intelligent remote terminal unit), ECU-1152 (an industrial communication gateway), WebAccess/SCADA (a graphics control program), and WISE-PaaS/Dashboard (a data visualization program).

The monitoring system worked with a soil measurement site and a weather measurement site. The former measures the environmental temperature and humidity in addition to the temperature, humidity, and electrical conductivity of soils. While the latter uses an IP camera to capture photos of the field environs. It also gauges sunlight, wind direction and speed, as well as, environmental temperature and humidity. Data from all these measurements are uploaded by the ADAM-3600 unit (installed at the weather measurement site) over a 4G network onto WISE-PaaS. Where they are then graphically displayed by WebAccess/SCADA in real time on the computer or mobile device. ECU-1152 takes over from the ADAM-3600 to send data when there is no need to deliver analog data from the field.

Stable hardware, easy-to-use software, effortless and efficient cloud platform

As to the motivation, for Sunforce using Advantech's products in designing the monitoring system, "we have been using Advantech's products since we started to develop solutions for monitoring data centers and intelligent factories," Mr. Lo explains. "Although there are times we shifted to other companies, their products often had to be repaired after one year of use. Advantech's products are more reliable." Besides, he adds, environmental conditions are harsher and wiring work are more demanding in the periphery of cornfields than in data centers or factories. Underlining the need to use electronic devices that are highly reliable and durable, consume moderate levels of power, and deliver data seamlessly to a cloud platform.

Regarding the hardware components of the monitoring system, both ADAM-3600 and ECU-1152 operate at low power levels and offer a wide temperature range of -40°C to 70°C. ADAM-3600, in particular, boasts modularization that enables it to accommodate different modules depending on the sensors used on-site. The firmware of these two hardware products can be updated remotely.

As for the system's software components, WebAccess/SCADA and WISE-PaaS/Dashboard allow a system developer to design user interfaces and system functions in addition to uploading data onto the cloud. They are straightforward and easily operated after a short period of training.

WISE-PaaS can operate on multiple public clouds, such as Microsoft Azure (which Sunforce used in designing the cornfield monitoring system). By leveraging this cloud platform, system developers can bring their cloud-based projects to fruition without taking up too much time or having to pay costly construction fees.

Lower the entry barrier to cultivate intelligent agriculture sooner than later

Technology is reshaping agriculture in a way that better equips farmers to grow high-quality, value-added crops. According to Mr. Lo, deploying a remote cornfield has reduced the frequency of field patrolling and performing data analysis which is contributed to higher overall corn quality. With such a system in place, human labor and fertilizer costs have both decreased by 30% for the cornfields in the township of Huwei.

Mr. Lo discovered that for systems integrators Advantech's product and service portfolios make it easier to maintain legacy systems and/or construct a project that can lower the entry barrier for crafting an intelligent agriculture solution. In the company of Sunforce's partnership with Advantech, Mr. Lo is seeking to boost his business in Taiwan, China, and Hong Kong. He believes that as a VIP member of the WISE-PaaS Alliance, Sunforce has received an abundant technical and marketing support from Advantech. ■



Advantech WISE-PaaS Industrial IoT Cloud Platform

Enabling AIoT Applications via Digital Transformation



ADVANTECH
WISE-PaaS
 AIoT Solutions & Marketplace

Microservices Architecture

Data Acquisition

Remote Asset Performance Management

Data Visualization

Cross-Platform Data Integration



ADVANTECH

Enabling an Intelligent Planet

Advantech's WISE-PaaS industrial IoT cloud platform provides edge-to-cloud software and services, including edge data acquisition, data analytics, visualization, and equipment remote management. It helps system integrators and manufacturers by enabling real IoT-powered cloud business models in various vertical markets and quickly develops SaaS and domain-specific IoT solutions.



WISE-PaaS Portal

Edge Sensing	Intelligent Connectivity	Edge Computing	Cloud Platform
WISE-PaaS/EdgeLink Machine-to-Intelligence Edge Engine	WebAccess/DMP Mass Router Deployment System	WebAccess/SCADA IIoT Application Software Framework	WISE-PaaS/WISE.M+ Cloud-Based IIoT Monitoring and Operating Platform
WebAccess/MCM Machine Condition Monitoring Software	WebAccess/NMS Cloud Network Management System	WebAccess/HMI HMI Runtime Development Software	
WebAccess/CNC CNC Machine Monitoring Software			

ITS Adopts Advantech's Energy Management Solution to Ensure Operational Efficiency of Saudi Arabian Solar Power Plant

Saudi Arabia is aggressively developing renewable energy sources by establishing a key solar power plant. System integrator, ITS, helped set up an acquisition management system (AMS) using Advantech's Embedded Hardware Platform and related equipment. The system collects on-site data and enables remote monitoring and management, so as to ensure the plant's operational efficiency.

Photos provided by Shutterstock

Interviewed with Diwakaran Kanagaraj, Partners Relationship Manager, Idel Technical Solutions



Governments around the world including those in the Middle East, the global center of oil production have been pursuing renewable energy sources in response to global warming and abnormal weather events.

Saudi Arabia is the world's largest producer and exporter of oil. In recent decades, its economic development has benefited greatly from these exports. But even Saudi Arabia is embracing renewable energy sources to reduce the amount of power generated by oil, natural gas and coal.

The country launched the first phase of its national renewable energy program in 2017, focusing on solar power plants as well as wind energy equipment. Their goal is to produce 3.45 GW from renewable energy sources by 2020 and 9.5 GW by 2023.

AMS at Saudi Arabian plant collects and integrates on-site data

In building this solar power plant in Saudi Arabia, the main contractor was confronted with data collection and integration challenges. The first challenge was how to collect on-site data of advanced metering infrastructure and distributed control systems, among others. The second was how to enable the smart system to be able to integrate the plant head-end system and plant performance module.

Therefore, the main contractor decided to adopt an AMS, with ITS being charged with its implementation. The aim was to use the AMS to collect and integrate on-site data, giving administrators access to all important data on a single platform.

The AMS structure designed by ITS consists of three levels: data collection, transmission and storage. At the lowest level, data is collected from on-site equipment such as electricity meters, pyranometers, albedometers and pyrhemometers.

Data from on-site process devices (which play an important role in the power generation process) is also integrated.

The collected and integrated data is then uniformly uploaded to the AMS server through network equipment, and immediately shown on large monitoring screens in the plant's management center. Administrators are thereby able to remotely keep track of the energy volume generated by, and operational status of, the on-site equipment.

Excellent reliability and integration capabilities of Advantech's solution fully satisfies ITS's hardware requirements

As this project involved a national-level solar power plant, both the main contractor and ITS had strict requirements for hardware equipment.

Requirements included the need to offer continuous and accurate collection of on-site data, stable operations, flexibility for further expansion, easy-to-use interfaces, as well as the ability to integrate multiple systems such as DCS and AMI.

ITS selected Advantech's embedded hardware platform and related equipment to satisfy such strict requirements. Having analyzed technology, usability, reliability and integration aspects, and even evaluated various solutions available on the market, Advantech was their vendor of choice.

At the plant site, ITS adopted Advantech's IoT gateway ECU-1051, which is used for data collection and transmission. The ECU-1051 is embedded with WISE-PaaS/EdgeLink technology. It can connect with equipment from different brands through software support for different communications, media and protocols. Via protocol conversion, data is uploaded to the main terminal. At the network and application levels, ITS utilized Advantech's Ethernet switches and enterprise-grade servers, respectively, which transmit data over the network and store relevant information.

Advantech's solution boasted tremendous reliability, an excellent reputation, easy installation and use, high quality, comprehensive functionality, and easy expansion. The advanced integration capabilities enable it to integrate systems, equipment and data of other brands, making it ideally suited to the renewable energy management sector. The solution not only enhances data collection efficiency and quality, but also helps ITS improve customer satisfaction and provide enhanced customer experiences.

In the future, Advantech will continue to deepen its involvement in the energy management sector, leveraging IoT and AI technologies to provide solutions to system integrators that include both software and hardware. End-users can thereby boost energy management efficiency and lower costs. Indeed, all companies active in this sector are entering a new era of smart energy management. ■



Advantech Plays Critical Role in Building Solar Energy Monitoring System for Dubai Al Maktoum International Airport

Solar power is one of the most important types of renewable energy. To optimize its performance, related systems must be continuously monitored. A technology solution developed by Intelligent Cloud Plus and Advantech for Dubai Al Maktoum International Airport offers real-time monitoring to effectively reduce carbon emissions and operational costs in a smart manner.

Photos provided by Advantech
Interviewed with Lawton Liao, General Manager, Intelligent Cloud Plus

Sustainable use of energy resources is critical in today's world. Conscious of their environmental impact, airports are seeking to bolster their green credentials by adopting clean renewable energy sources such as solar energy in order to contribute to the sustainable development of the aviation industry.

Dubai Al Maktoum International Airport embarked on its journey to become a smart and sustainable airport by launching a proof of concept project to build two solar energy glass facilities—one equipped with heat insulation solar glass (HISG) developed by Prof. Young Chin-Huai of National Taiwan University of Science and

Technology and the other with single glazing glass so as to gain insight into their performance in terms of transmission, generation and insulation.

End-to-end solution for real-time monitoring

A real-time monitoring system was needed to acquire relevant data of these facilities. Since the temperatures in Dubai can reach up to 45 degrees Celsius during the summer, it was also essential that the facilities and their monitoring system function properly even in extreme weather conditions.

The project, which had to be completed within six months, was managed by Intelligent Cloud Plus, a company that boasts extensive experience in smart environmental management.

In consideration of the project's relatively short duration, Intelligent Cloud Plus wanted to work with an enterprise that could offer a mature end-to-end solution including sensors, gateways, data collection, real-time monitoring, data analytics, and cloud management. Intelligent Cloud Plus quickly identified Advantech as an ideal partner to build the real-time monitoring system for the solar glass facilities.

The architecture of the monitoring system consisted of a private cloud in Taiwan built on Advantech's WISE-PaaS/WISE.M* and WISE-PaaS/EnSaaS, as well as HPC-7242 industrial server.

This was connected to the ECU-4784 power automation computer in Dubai, which linked to the two solar glass facilities through the ECU-1251 industrial communication gateway and WISE-4010 IoT ethernet I/O module. This architecture was able to conduct real-

time monitoring of glass-surface temperatures, external temperatures, humidity, electricity usage, and A/C operations.

Enabling the airport to optimize energy efficiency

As part of the solution, Advantech provided not only rugged hardware but also user-friendly software. The web-based monitoring system allowed users to easily check data and run commands in real time.

For example, when users reviewed data from Dubai Al Maktoum International Airport through the system's dashboard, they could directly adjust equipment temperature in response to local conditions, thereby maximizing energy efficiency.

For developers or system integrators like Intelligent Cloud Plus, Advantech offers integrated cloud (WISE-PaaS/EnSaaS), IoT (WISE-PaaS/WISE.M*) and edge (WebAccess/SCADA) platforms that provide easy operations and allow them to devote more time and resources to adding value. Indeed, feedback from developers and system integrators has shown that Advantech's platforms help them reduce the time needed to develop customized end-to-end solutions for customers by 50 percent.

Lawton Liao, General Manager of Intelligent Cloud Plus, stated that "even though companies in Taiwan boast excellent technologies and products, it can be hard to make an imprint in international markets due to lack of business scale or brand name recognition. It was therefore a wonderful experience to work with Advantech, whose brand is renowned worldwide and which can deliver integrated hardware and software solutions for a wide range of professional services." ■





Advantech's Cloud-Based Solution Enables EWK to Increase Equipment Lifespan and Reduce Service Costs

Smart care solutions for cooling towers are among the most advanced and complex IoT solutions available today. The solution adopted by EWK features an IoT accelerator, dashboard solution, Advantech's edge communication gateway solution ESRP-PCS-ECU-1251, as well as a telecommunication component.

Photos provided by Shutterstock
Interviewed with Maarten Wijffelaars, Owner, Cool Industries BV

EWK utilized Advantech's WISE-PaaS/EdgeLink for data pre-treatment, hierarchical visualization, and real-time monitoring, allowing EWK and its customers to monitor the status of their equipment remotely. The detailed monitoring of their equipment allowed them to make advanced arrangements for repair and maintenance, so as to prevent cooling towers from breaking down unexpectedly and thereby halting factory operations.

Remote monitoring and early fault diagnostics

EWK, a Spanish company that specializes in the design and manufacture of energy-efficient cooling towers, evaporative condensers, and adiabatic equipment, has installed tens of thousands of cooling towers around the world.

The most challenging factor in managing cooling towers is preventing malfunctions; cooling towers often stop working without any prior warning signs.



Most customers that own cooling towers operate 24/7 production facilities. When cooling towers break down, the temperature of the operation process is no longer controlled. This can lead to costs related to equipment repair and fines from inspection authorities. Operational malfunctions can thus cause great dissatisfaction among customers, which in turn could affect the bottom line.

Until recently, if customers had not signed service maintenance contracts, there would be no way for EWK and its service partners to stay informed on of the precise status of installed equipment. To solve this issue, EWK's priority was to find advanced IoT solutions. Advantech's reputation in this field quickly caught its attention.

EWK implemented Advantech's ECU-1251, an all-in-one small industrial communication gateway that uses Modbus TCP, as well as WISE-PaaS/EdgeLink, enabling both customer and manufacturer to monitor the performance of the equipment remotely.

This allows for early detection of faulty hardware and facilitates preparation for timely services.

EWK staff can also see system information on the user-friendly dashboard and thereby stay updated on the

performance of the equipment and provide any necessary services to customers.

Advantech's ECU-1251 with WISE-PaaS/EdgeLink can be easily installed in the smart control cabinet of the cooling tower. The ECU-1251 transmits Modbus TCP data over the telecommunications network to the Ericsson Cloud IoT Accelerator, and the software converts data and translates it into user-friendly information which is broadcasted on the SmartLog AKURA dashboard. The solution can be connected to almost any industrial hardware device or cloud-based platform. This setup gives EWK instant feedback on the performance and condition of its cooling towers.

Since EWK's product line is based on the Ericsson Cloud IoT Accelerator, it leverages the advantage of the LWM2M protocol for effortless zero-touch planning for thousands of cooling tower upgrades. Advantech's ECU-1251 connects seamlessly to the existing PLC using Modbus TCP, and its Modbus serial ports can provide instant upgrades to obtain more sensor inputs using Advantech's WISE series IoT ethernet I/O modules or ADAM series ethernet I/O modules. Also, with Advantech's free downloadable software, it is easy to configure and program according to user demand.

Smarter cooling with smarter services

EWK provides products that are reliable, efficient in performance, resistant to corrosion, and friendly to the environment. One of the key features of EWK's cooling towers is ease of maintenance. EWK's products are designed to facilitate interior access and allow cleaning and maintenance tasks to be completed within the shortest time possible, in line with health regulations.

With Advantech's solution, EWK and its resellers in the cooling industry can offer better services that are more accurate, at a lower cost. Customers are able to easily manage the cooling towers and receive advanced notifications in the event of abnormalities. This eliminates the need for biannual maintenance, thereby significantly reducing operational costs.

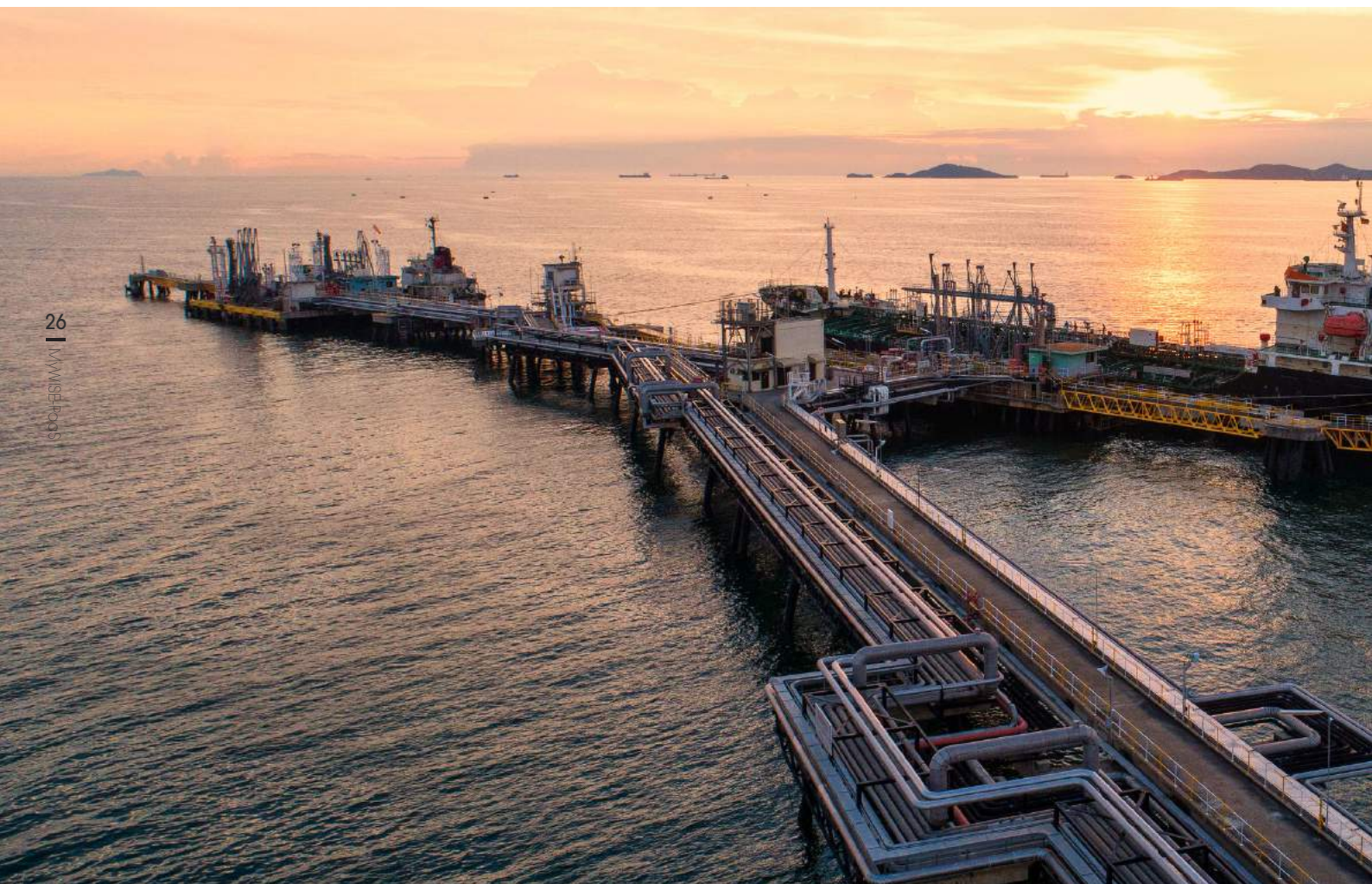
Advantech's WISE-PaaS/EdgeLink is one of the most advanced IoT solutions available on the market. It is ideal for the smart care of cooling towers, enables remote monitoring of overall performance and various components, as well as diagnostics. The cloud-based solution eliminates the hassle of numerous hardware devices and fully realizes the potential of IoT. ■

Precise and Efficient Smart Monitoring of Oil Unloading Operations in Ports

With the help of Advantech's edge data collection solution ESRP-PCS-ADAM3600, the monitoring and measurement of crude oil unloading operations at ports in Thailand has become more precise, reducing human errors and related disputes.

Photos provided by Advantech

Interviewed with Scott Sun, Product Manager of the Industrial IoT Group, Advantech



Unloading oil tankers is a time-consuming and labor-intensive process. Even after pipelines have been connected and the unloading process has been activated, operators must pay close attention to aspects such as

volume, pressure and temperature, as well as weather conditions and wave height. Even the smallest details can impact unloading. Once the unloading has been completed, precise measuring of oil volume plays a key

role in ensuring that no compensation disputes arise between seller and buyer.

Realizing real-time monitoring and precise measurement with IoT

According to Scott Sun, Product Manager of Advantech's Industrial IoT Group, "in the era of IoT, where everything can be interconnected, automatic data acquisition through technological products can provide a scientific basis for real-time monitoring and precise measuring of crude oil unloading operations remotely from a central control room, reducing the possibility of human error and the risk of data manipulation and oil theft."

Due to the drawbacks of human measurement and supervision, the Thai government decided to appoint a leading SCADA vendor to design a graphics control system for real-time monitoring and precise measuring at various ports in Thailand, allowing oil tankers to efficiently complete unloading when they arrive at port.

However, this graphics control system, specifically designed for oil unloading operations, cannot function properly without access to related data. Sun said that "Advantech's edge DAQ platform fulfills demand for data acquisition and upper system connections. The implementation of Advantech's ESRP-PCS-ADAM3600 in the graphics control system allows for easy data collection and uploading."

The ESRP-PCS-ADAM3600 is an edge solution-ready package that combines the remote terminal unit (RTU) ADAM-3600 and protocol converter software WISE-PaaS/EdgeLink. It supports communication protocols such as Modbus, DNP3, and IEC-60870-5-104; offers a variety of I/O interface options and multiple expansion slots; enables wired and wireless communication transmission for easy links with underlying sensors, meters and devices; and preprocesses acquired data before uploading it to SCADA software.

In addition, the ESRP-PCS-ADAM3600 has efficiency-related advantages such as the built-in conversion formula that converts acquired signals into meaningful data (e.g., converting 10mA into 100°C); features like local data storage, time stamps and offline uploading that ensure data accuracy even in the event of network

disruptions; and plug-and-play functions that allow system integrators (SI) to easily conduct data uploading, analysis and visualization without complicated programming or configurations.

Widely recognized products and services

Sun explained that the vendor for the Thailand project, a leader in SCADA software development, has collaborated with Advantech in the power and energy sector for many years. It is therefore very familiar with and confident in the functionality and stability of Advantech's products. The vendor thus also chose Advantech for this project, so as to ensure strong data acquisition features as well as seamless integration of SCADA software.

Other than the excellent functionality and stability of Advantech's products, Sun also emphasized the strong support that Advantech's technical team provides to SIs. In the trial period of this project, there were issues with uncontrolled output.

Following a debugging process performed by Advantech's technical team, the cause of the problem was identified as incorrect input of parameters; the issue could be resolved by simply correcting the parameters. "Advantech and its partners each have their own expertise; when partners need assistance, Advantech will spare no effort in working with them to provide the best possible solutions, technical support, and services," said Sun proudly.

The oil unloading project in Thai ports successfully completed the trial phase in the middle of 2018. The products and services provided by Advantech have been well received by both the end-user and the SCADA software developer.

The latter also continues to collaborate with Advantech on new projects in the power and energy sector. Sun added that "the use IoT technology for data acquisition, analysis and application has become a popular trend in this sector, with the edge DAQ platform serving as an essential element in related solutions.

Advantech will continue to work in close coordination with partners to develop solutions that meet the demand of industries." ■

The Co-Creation Model and a Complete IoT Ecosystem

IoT applications in the energy and environment (E&E) sector suffer from fragmentation. Overcoming challenges of integration requires close collaboration between relevant stakeholders. Therefore, Advantech initiated the co-creation model, providing platform resources and making investments to form close partnerships with system integrators (SI) and together realize the mission of enabling an intelligent planet.

Photos provided by Advantech

Interviewed with Michael Huang, Project Associate Manager, Advantech Corporate Investment

Looking at smartphones, Apple and Google built mobile internet ecosystems with the iOS and Android platforms, respectively, allowing developers to rapidly create applications, fostering tremendous innovation, and transforming smartphones into essential devices in our daily lives. With the popularization of the internet, Advantech took note of the fact that industrial IoT covered a wide range of sectors, with each sector featuring a deep knowledge base, making it extremely difficult to promote industrial IoT applications. Advantech realized that the only way to accomplish its mission of enabling an intelligent planet was building a complete industrial IoT ecosystem. Advantech thus launched the industrial IoT cloud platform WISE-PaaS to bring together SIs and developers to co-create such an ecosystem.

Advantech launched a three-phase co-creation process

Michael Huang, Project Associate Manager of Corporate Investment at Advantech, stated that “to develop smart applications, building networks is not enough; it is vital to fully grasp the business processes of each sector and analyze relevant data to create smart management mechanisms.” SIs play an important role in creating such mechanisms, since they possess critical expertise and experience in specific sectors. If Advantech itself were to enter such sectors to develop smart applications and provide services for smart systems directly, it would run into conflicts of interest with SIs, some of which are also its customers. Furthermore, there

was no way for Advantech to completely grasp necessary know-how in each individual sector. The co-creation model thus offered the best option.

Advantech’s co-creation model is divided into three phases. The first phase involves the integration of network and sensor technologies under the IoT framework, enabling SIs to rapidly connect remote operational equipment and acquire relevant data. The second phase constitutes the consolidation of IT, OT, cloud, and AI technologies to build the industrial cloud platform WISE-PaaS, allowing SIs to upload data to the platform and rapidly build various industrial applications using the platform’s tools.

In the third phase, the global co-creation model is activated to assist SIs in transforming themselves into domain-focused solution integrators (DFSI).

Using co-creation to solve IoT fragmentation

Especially in smart management in the E&E sector, there is great need for co-creation. “A high degree of fragmentation exists in E&E management,” said Huang. The fragmentation consists of two layers: fragmentation of connectivity among equipment, and fragmentation in business processes. Both forms of fragmentation need to be overcome for the E&E sector to push forward.

Using the Chinese SI Anjie Services as an example, this company has long been focused on energy management of public facilities. Past collaboration between Anjie Services and Advantech mainly centered on equipment procurement, with Anjie Services building

smart applications on its own platform.

The company had to adjust the base technology and structure of its platform for each project's environment and needs, which required large amounts of time and manpower.

After Advantech launched the WISE-PaaS platform, the two companies started collaborating even more closely. In addition to purchasing hardware equipment, Anjie Services also began using the sensor- and network-level services and tools provided by the WISE-PaaS platform to develop cloud management solutions.

Instead of sending out engineers for on-site inspections, real-time remote monitoring is now used for all projects, enabling Anjie Services to focus its resources on the innovation and development of applications, building more industrial applications and offering more operation and maintenance management services for various sectors. If Anjie Services becomes Advantech's DFSI in the future, it could utilize Advantech's global marketing network to promote its smart applications in the vast markets of China and the rest of the world.

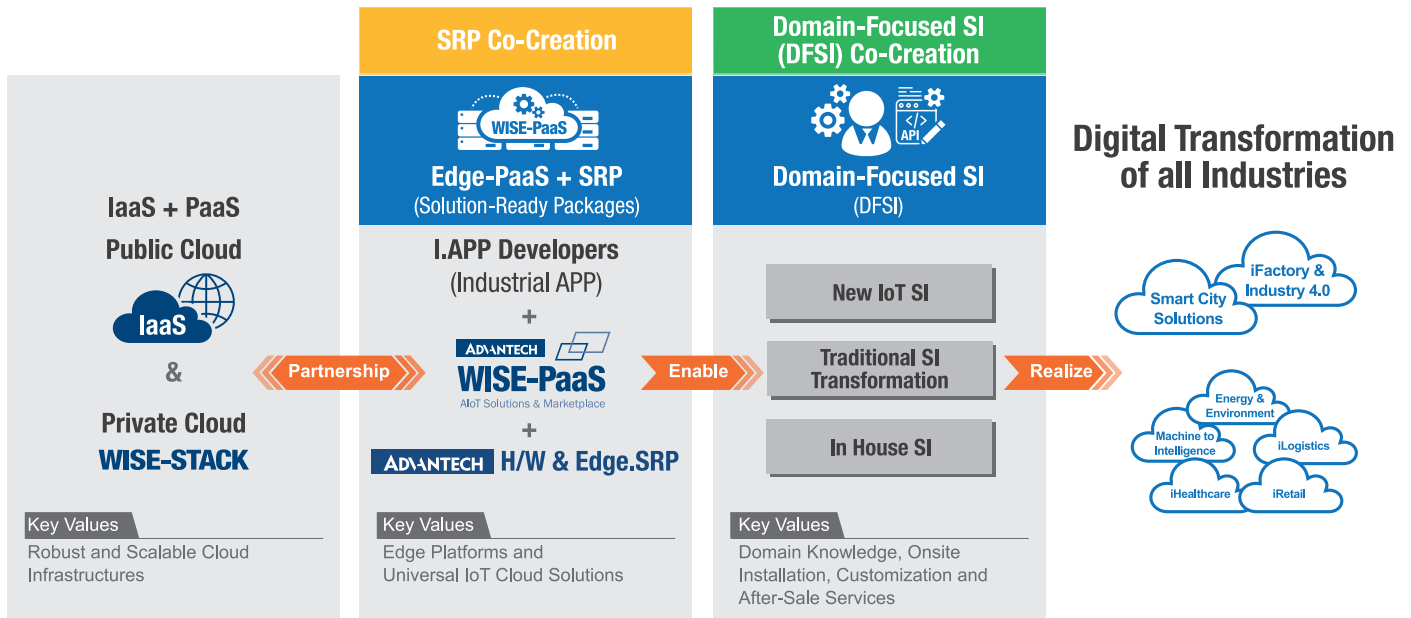
Innovative model for operation and maintenance services

For SIs, the benefits of the co-creation model are not limited to the ability to rapidly replicate E&E applications through the WISE-PaaS platform; the model also helps them realize the goal of digital transformation and make the transition from purely selling solutions to managing innovative models for E&E operation and maintenance services.

Using the smart management of electric substations as an example, Huang explained that traditional substations normally require four to five staff members. However, with the implementation of smart management, the SI can remotely monitor the status of the substation in real time and send out notifications and warnings to the administrator in the event of emergencies, greatly reducing manpower requirements. In addition, the SI can elevate itself from building projects to providing sustainable services for operation and maintenance management, increasing its added value and generating higher profits.



Ecosystem & Value Chain of Industrial AIoT



Investing in co-creation partners to form closer bonds

To form closer partnerships with SIs, Advantech will establish a Partner Success Engagement Team to empower SIs, to the extent of helping them expand markets and allowing co-creation partners to fully utilize Advantech’s advantages in areas ranging from technology to marketing. Also, by taking stakes of less than 20% in co-creation partners, Advantech can assist them in upgrading to DFSI partners.

Huang emphasized that in the internet sector, companies like Alibaba and Tencent have created an industry ecosystem through capital investment to increase profit and obtain market opportunities. Advantech has adopted a similar strategy, taking small stakes in and providing funds to partners, while delivering comprehensive resources and support, e.g., early access to projects, sharing of global marketing networks, and participation in talent training and innovation events. In this way, Advantech helps SIs evolve into DFSIs.

In the E&E sector, Advantech has already invested in the SI HwaCom Systems, and is discussing the possibility of investing in Anjie Services. It has also set up a DFSI joint venture for water and wastewater treatment with GSD Industrial, a subsidiary of GSD Technologies and a leading brand in environmental equipment.

In the future, this joint venture will focus on the development of smart applications for wastewater treatment, water purification, and public infrastructure projects.

Based on his professional experience, Huang firmly believes that it is impossible for a single company to popularize IoT globally. He therefore expressed strong support for the co-creation model, adding that this model was one of the reasons why he joined the company. He said he was very confident that the strategy of co-creation would allow Advantech to play a key role in driving the growth of the IoT industry and overcoming the challenges of digital transformation, and that Advantech and its co-creation partners would initiate a new wave of growth momentum in 2020. ■

Transmitting Data from the Edge to the Cloud with WISE-PaaS/EdgeLink

Powerful Middleware for Intelligent Gateways



MQTT OPC UA
WISE-PaaS/EdgeLink

ADVANTECH
WISE-PaaS
IIoT Solutions & Marketplace



ADVANTECH

Enabling an Intelligent Planet

Transmitting data to the cloud for easy integration

Advantech's WISE-PaaS/EdgeLink is a lightweight gateway software solution that supports data acquisition for asset monitoring, performance tracking, alarm notifications, system management, and remote configuration. WISE-PaaS/EdgeLink ensures easy migration from stand-alone legacy systems to modern IoT architectures by providing an intelligent platform that serves as a bridge between devices. Furthermore, WISE-PaaS/EdgeLink enables superior monitoring and control of field equipment and industrial facilities.

Edge Gateway Solutions



WISE-PaaS/EdgeLink

- ESRP-PCS-ECU4553
- ESRP-PCS-UNO420
- ESRP-PCS-WISE710
- ESRP-PCS-ADAM3600
- ESRP-PCS-ECU1051
- ESRP-PCS-ECU1251

Edge AI Solutions



Azure



- ESRP-CSS-UNO2271
- ESRP-CSS-UNO1372
- ESRP-CSS-UNO2484
- ESRP-CSS-UNO2372



Becoming an Enabler for an Intelligent Planet: HwaCom Systems Joins Advantech's Co-Creation Movement

Smart city solution provider HwaCom Systems is collaborating with Advantech to build smart environmental management platforms. The company has received an investment from and become a co-creation partner of Advantech, paving the way for closer collaboration in developing an intelligent planet.

Photos provided by Advantech

Interviewed with Ming-Yeh Hsieh, Vice General Manager of the Marketing and Information Services Division, HwaCom Systems

Imagine a scenario, an administrator of an industrial zone, sitting in a central control room, being able to monitor air quality and wastewater. They would receive instant warnings in the event of a disaster, in real time. Data accumulated on such a platform over an extended period of time, could assist in future improvements in the industrial zone's environment.

This scenario has become a reality with the smart

environmental management platform. It consists of water and air quality monitoring that is based on an industrial application developed by HwaCom Systems on Advantech's WISE-PaaS platform. The solution delivers instant and efficient smart management for industrial zones. Helping reduce pollution and minimize the occurrence of a threat, thus, creating a better environment for people working in such zones.

WISE-PaaS platform and WISE.M+ equipment management services enhance R&D

Established in 1994, HwaCom Systems focused on technical services for broadband network infrastructure. Later they invested in the advancement of telecommunications value-added application services. With the onset of smart cities, the company in 2009 took on a smart transportation project for the government. They have accumulated over a decade of experience in broadband network technology and telecommunications value-added software. HwaCom Systems perfected a smart transportation system that incorporated traffic flow analysis, traffic congestion monitoring, and weather forecasts. This enabled the company to position itself as a system integrator (SI) specializing in smart city development. In addition to focusing on innovation in smart transportation applications; the company also took advantage of the emergence of environmental sustainability concepts, entering the field of smart environment applications. Subsequently, it won a project to build a smart environment management system in 2016 under the Taiwan government's Asian Silicon Valley program.

According to Ming-Yeh Hsieh, Vice General Manager of the Marketing and Information Services Division of HwaCom Systems, when Advantech was actively looking for SI partners to collaborate on the WISE-PaaS platform, HwaCom Systems already had its own IoT platform. However, the complexity of the data associated with smart applications continued to grow, especially with regard to data collection and analysis for environmental monitoring. HwaCom Systems therefore decided to collaborate with Advantech and utilize its WISE-PaaS platform and WISE.M+ equipment management services to develop smart management systems.

While the WISE-PaaS platform performs the complex lower-level IoT tasks of data acquisition, pre-processing and analysis; HwaCom Systems can focus on system development for industrial applications. Hsieh pointed out that HwaCom Systems had previously purchased various Advantech hardware products for devices used in IoT applications. The company also worked with Advantech's WISE-PaaS platform to rapidly integrate publicly available data of weather forecast agencies; as well as

environmental information with its own IoT technology. It then proceeded to expand smart environmental management platforms with modules. This included, video streaming, water level and air quality monitoring, multivariate correlation analysis, historical data deep learning, smart learning, and early warning detection. These modules allow for real-time monitoring of environmental data like pH levels, electrical conductivity, and suspended solids concentration. By developing various programs for smart environmental monitoring and value-added applications, the company has enabled administrators to improve environmental management in industrial zones.

Collaboration with Advantech to expand into international markets

Due to their collaboration on smart environmental management platforms, HwaCom Systems and Advantech have built a mutually beneficial partnership. Allowing them to take advantage of even more business opportunities. Both companies were willing to engage in even closer cooperation. This led to Advantech obtaining a 20% stake in HwaCom Systems in July 2019. HwaCom Systems thereby officially became a co-creation partner of Advantech in the field of smart city IoT ecosystems.

According to Hsieh, data security concerns exist in both smart transportation and smart environment projects. Customers are not easily convinced to upload data to public clouds. Therefore, based on their unified relationship, HwaCom Systems and Advantech will focus on enterprises' own networks and private clouds in the near future. In an attempt to, obtain additional smart city projects.

In the meantime, they intend to build new IoT applications based on hybrid cloud models; helping customers centrally manage and maintain application systems across the cloud. Their long-term goal is to use Taiwan as a testing ground to converge replicable modularized services. As well as, verify the feasibility of business service models and leverage Advantech's global distribution system to promote HwaCom Systems internationally. This will open up markets in Asia and Europe and together fulfill the mission of enabling an intelligent planet. ■



Advantech Co-Creating the Future of the IoT World

Photos provided by Advantech

In 2019, Advantech has organized CCPCs (Co-Creation Partner Conference) around the world, promoting the concept of co-creation in major cities and attracting more partners to join the WISE-PaaS platform—Advantech’s industrial cloud platform. Concrete results have been achieved in Taiwan, emerging markets, Australia, Japan, Russia, Korea, Turkey, Europe, and China.

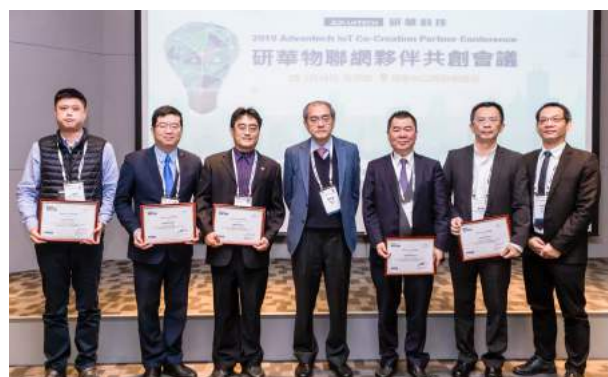
Advantech’s purpose in holding the CCPC events is to accelerate business endeavors with DFSIs (Domain Focused System Integrators) via co-creation and edge-to-cloud integrated solutions, thereby paving the way for successful digital transformations. Based on the experience of connecting with global partners at the CCPCs, Advantech is planning to hold the 2020 WPC (World Partner Conference) event on December 5, 2019.

At the WPC event, Advantech will announce that it is processing the industrial applications completed in the first phase of its co-creation project by first decoupling and then reintegrating them; developing modular industrial applications to give SI partners easy access to certain feature modules by offering a variety of industrial applications; accelerating IoT adoption through micro-services; and cultivating more IoT business opportunities.

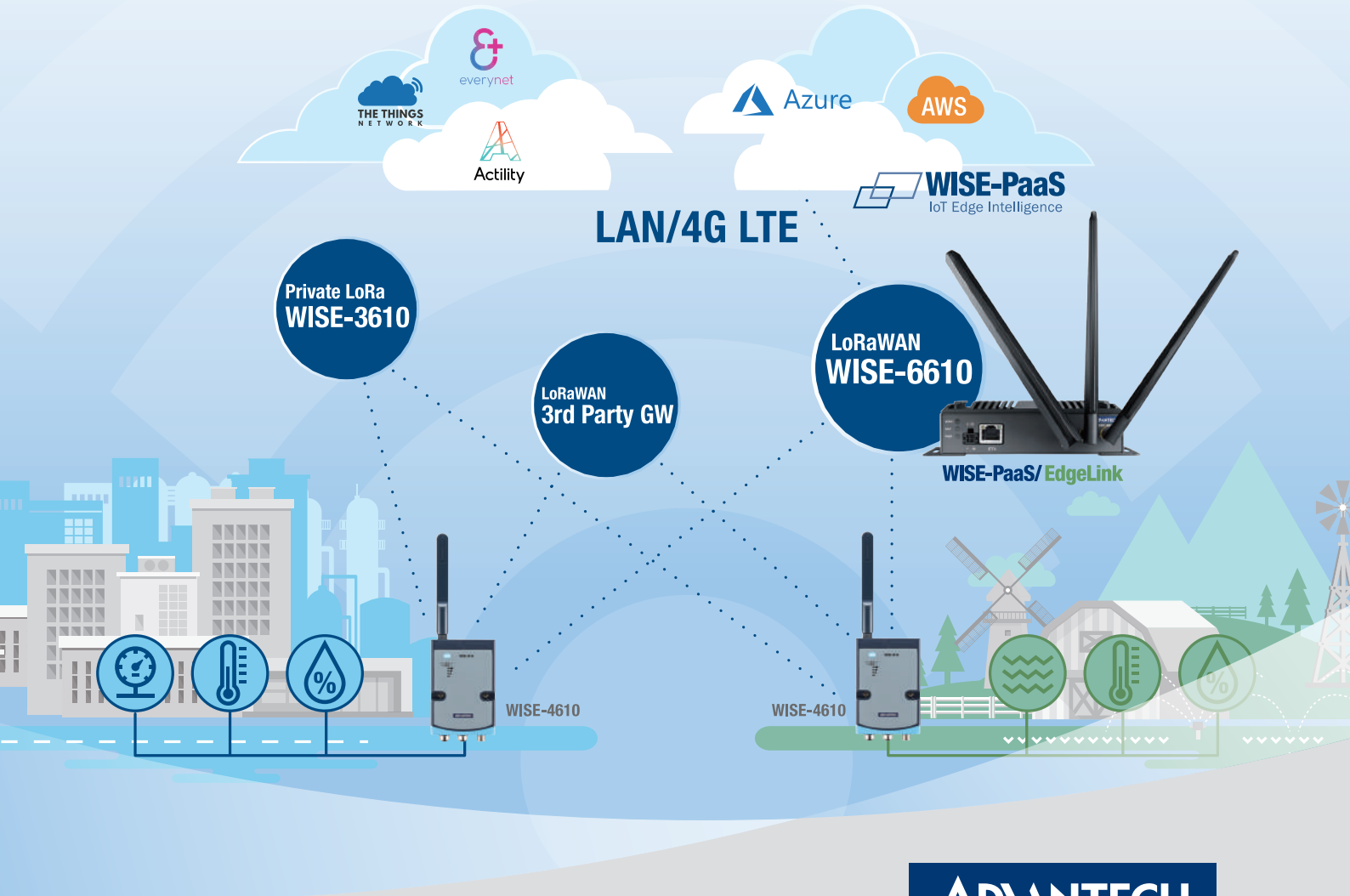
Specifically, Advantech is enabling DFSIs to connect

with Advantech’s software and hardware such as gateways, controllers, SCADA, WISE-PaaS/EdgeLink, and cloud-based device management solution WISE-PaaS/WISE.M*; design micro-services for domain-focus applications such as wastewater treatment management, integrated energy, and smart scientific parks; and create dedicated systems that meet the needs of specific industries.

In 2020, Advantech will foster relations with even more DFSI and developer partners to co-create more applications and create an external ecosystem, with the ultimate aim of building a complete industrial IoT value chain. ■



Cloud Integration Architecture of LoRaWAN



ADVANTECH

Enabling an Intelligent Planet

About LoRaWAN

Advantech LoRaWAN solutions provide a device-to-cloud solution by simply sending collected data through the LoRa gateway to the cloud. It supports both public LoRaWAN and private LoRaWAN solutions. With EdgeLink inside the gateway, it also helps users simply plug-and-play without worrying about data parsing processes.



Industrial LoRaWAN Gateway

- Low power consumption for solar and battery power applications
- Ethernet and I/O for connecting a wide array of field assets
- LoRaWAN protocol for closed and public system application
- Long-range wide area IoT gateway



LoRa/LoRaWAN Wireless Module

- Private LoRa and LoRaWAN selectable
- Less interference than 2.4GHz spectrum
- Application-ready I/O combination with IP65 enclosure
- Powered by solar rechargeable battery or 10-50VDC input

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