

Enabling an Intelligent Planet

Intelligent Healthcare

Advancing Patient Safety Through Improving Medication Efficiency



Application Story

Driving Thai Hoa Hospital's Transformation into Vietnam's First Smart Hospital **p.14** Pingtung Veterans General Hospital Ensures Medication Safety in Southern Taiwan **p.20** Revolutionizing Vital Sign Monitoring with a Continuous, Contactless Solution **p.28**

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Microsoft to Develop Cloud-
Based iHospital Solutions for
Smart Hospitals

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Reliable OR Solutions for Exceptional Care A future-proof platform to transform surgical

imaging workflows



iVideOR Solutions

Advantech's iVideOR operating room video management and editing software platforms are designed to simplify the medical video management process. iVideOR allows healthcare professionals to live stream surgeries, record procedures, and manage captured video data from a centralized location.



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Revolutionizing Healthcare Delivery and the Patient Experience

According to a report by McKinsey & Company, advancements in technology and healthcare are reshaping how healthcare is delivered and experienced. Technology has become deeply integrated into various aspects of hospitals, ranging from medication management and operating room design, to disease diagnosis and patient care.

Aligned with healthcare digitalization trends, the theme of this issue of WISE-IoT iHealthcare is innovative smart healthcare applications and technologies. We share the views of several industry professionals, including Xuan-Lin Wang, Assistant Manager of Intelligent Healthcare Business at Advantech, who discusses the development trends of smart healthcare in emerging countries and regions such as Southeast Asia, India, and the Middle East, highlighting Advantech's introduction of healthcare solutions tailored to meet the diverse needs of local markets. In addition, Kaustubh Suresh Savant, Consultant of Healthcare and Life Sciences at Frost & Sullivan, highlights the ongoing issue of medication safety and its impact on the lives of patients and describes how the utilization of information technology can significantly reduce medication errors.

This issue also contains eight case studies detailing Advantech's co-creation efforts with global partners to educate readers about the latest developments in smart healthcare services. This includes Thai-Hoa Hospital's partnership with Advantech in building Vietnam's first smart hospital to address medical resource scarcity and how they improved medical service quality. We also learn about how VitalThings combined Advantech's HIT-512 Medical-Grade Information Terminal with radar and sensor technology to create VitalThings Guardian for Project Autoskår, thus enabling the continuous, contactless monitoring of vital signs while enhancing proactive care and patient outcomes. We also explore Advantech's collaboration with Pingtung Veterans General Hospital in ensuring medication safety for patients in southern Taiwan.

In the Customer Partnership section, we outline how Advantech's partnership with the Chiu Ho Medical System, a medical equipment distributor is part of the trend toward hybrid operating rooms (HOR). We detail how the two companies collaborated to assist Taiwanese healthcare providers in establishing HOR, thus enhancing surgical safety and improving treatment success rates.

As a prominent provider of medical devices, Advantech is committed to further advancing the field of healthcare by actively collaborating with global partners to develop an array of intelligent medical devices and services. By doing so, we aim to create a substantial positive impact, benefiting patients, medical professionals, and hospitals worldwide.

Smart Hospital





Accelerating the Development of Smart Healthcare in Emerging Economies

Photos provided by Advantech Interview with Jason Wang, Sales Director, Intelligent Healthcare Business of Advantech

Advantech is accelerating the development of smart healthcare in countries with emerging economies by leveraging its experience promoting smart healthcare in Taiwan. To do this, the company is introducing healthcare solutions that meet the diverse needs of local markets in Southeast Asia, India, the Middle East, and other regions. By collaborating with more SI partners in the medical field, Advantech intends to deploy intelligent applications in hospitals in multiple countries, thus tapping into the immense market potential of smart healthcare.

Southeast Asia and India implement smart systems in operating rooms and ICUs

The fast-paced economic growth of Southeast Asian countries has increased demand for medical services. Coupled with the potential economic impact of population aging, demand for healthcare services continues is set to grow. Driven by government policies, Vietnam, Malaysia, and India are among countries accelerating the promotion of smart healthcare. Given their expertise in software, hardware, and IoT solutions, Advantech is in a strong position to target potential business opportunities in these countries.

Jason Wang, Sales Director of Advantech's

Intelligent Healthcare Business, explained that while European and American countries have strict medical regulations regarding the use of hospital equipment, Southeast Asian countries and India have fewer regulatory restrictions. As a result, hospitals are permitted to use regular PCs for intelligent applications. This makes it difficult for Advantech's medical-grade computers to enter the market. However, critical care units such as operating rooms and ICUs have more stringent requirements in these countries. Thus, Advantech is focusing on the intelligentization of operating rooms and ICU wards in these markets.

Electronic medical record implementation has enabled paperless operations in only 40% of public hospitals in Vietnam. Given the low demand in that market, Advantech is focusing on intelligent healthcare in the private sector. An example of this is their successful collaboration with Thai Hoa General Hospital, which now has a complete intelligent system with Advantech iWard, iMedication, iVideOR, and Telehealth. In Malaysia, Advantech has invested in local SI partner EncoreMed to integrate their outpatient systems with Advantech's inpatient system, iWard, creating a more comprehensive smart healthcare solution for Malaysian hospitals. In "Advantech will replicate and export Taiwan's successful experiences in promoting smart healthcare to markets such as India, Vietnam, Malaysia, and the Middle East to seize business opportunities for smart healthcare services in emerging countries." - Jason Wang, Sales Director of Advantech's Intelligent Stealthcare Business,

Thailand, Advantech partnered

with a local SI specialized in ICU integration and successfully deployed hundreds of medical computers for ICU monitoring. In India, Advantech is keeping pace with the government's efforts to promote smart healthcare. They have helped implement intelligent systems in 200 operating rooms across the country since 2022.

Complete iHospital solution successfully deployed in the Middle East

Advantech is expanding its market reach beyond Southeast Asia and India and has set its sights on the Middle East in 2023. This includes countries such as Qatar, the United Arab Emirates, Saudi Arabia, Kuwait, and Israel. Among these, Advantech solutions have already been deployed in Saudi Arabia in a trend that is set to deepen.

"Saudi Arabia's healthcare expenditure per capita ranks first in the Middle East," pointed out Mr. Wang. Operating in the Saudi Arabian market since 2020, Advantech has already established many partnerships in the country. Now, the launch of iHospital is making it easier to help more hospitals in Saudi Arabia adopt intelligent healthcare systems. With a projected population of over 40 million by 2030, Saudi Arabia will face challenges meeting the healthcare needs of its rapidly aging and growing population, as well as those with chronic diseases. Smart healthcare solutions can help meet these challenges by ensuring sufficient healthcare resources and maintaining healthcare guality, thus presenting potential business opportunities.

Markets in the Middle East, particularly those in Saudi Arabia, are highly competitive. Advantech must adopt a differentiated strategy to succeed in these regions. Mr. Wang emphasized that Advantech's intelligent healthcare team has excellent system integration and flexible customization capabilities. With the continuous development of diverse systems, Advantech's hospital can deliver a comprehensive smart healthcare solution that can be applied across various hospital fields.

While the smart healthcare industry in emerging countries may be slower to develop, the potential for future demand is promising. In addition to continuing to expand its presence in smart healthcare markets in the United States and Europe, Advantech will also invest more in countries with emerging economies to promote the health and well-being of more people.

Key Issues in Medication and Their Impact on Patient Safety

Photos provided by Frost & Sullivan Article by Kaustubh Suresh Savant, Consultant of Healthcare and Life Sciences of Frost & Sullivan



Prescription drugs are important for improving and maintaining health. Almost 66% of adults in the US use prescription drugs. However, these medications can be harmful if not consumed as prescribed. Any preventable event that may cause inappropriate medication use leading to patient harm is called a medication error event. These events could be related to prescribing, product labeling, dispensing, administration, etc. As per WHO in 2017, the cost of medication errors has been estimated at US\$42 billion annually or almost 1% of total global health expenditure. In the UK an estimated 237 million such events occur annually, with one-fourth requiring significant clinical care; while in the US, such events cause at least 1 death per day and injure approximately 1.3 million annually. Thus, these events are a major threat to patient safety.

Medication error events underlying reasons

The Institute for Safe Medication Practices (ISMP) published a report on the most common medication events (errors & hazards) in 2020 with serious consequences for patients. According to this report the ten most common medication error events are

1. Omission or delay in medication

- 2. Giving medication to the wrong patient
- 3. Allergies or adverse events associated with the medication
- 4. Wrong dosage for pediatric patients
- 5. Improper labeling or the packaging of medication
- 6. Lack of use of smart infusion pumps resulting in wrong dispensing
- Accidental administration of neuromuscular blockers
- 8. Mistaken intravenous administration of oral liquid medications
- 9. Errors in medication reconciliation on hospital admission and discharge
- 10. Comprehension problems among patients about how to use the medication

For addressing these challenges it is important to address the underlying reasons such as distractions of physicians while prescribing or writing drug orders, distortions resulting from the use of abbreviations, poor writing, improper translation, or misunderstood symbols, excess workload resulting in stress and fatigue of nurses/ health professionals, poor communication between the physician and nurses or patients, non-regulated access to medication for patients, older patients and weak physical conditions also sometimes lead to adverse drug events.

HIMSS stage 6 and technologies for medication safety

An unfortunate but well-reported problem of modern health care is the prevalence of medication error events in hospitals. One method for reducing the impact of these events is using information technology.

Adoption of HIMSS Analytics Electronic Medical Record Adoption Model (EMRAM) stage 6 helps hospitals to provide better patient care by reducing the events and improving medical communication and clinical workflow. As per the HIMSS Analytics EMRAM model stage 6 requirement hospital needs to practice physician documentation and closed loop medication administration which includes:

- Physician documentation with underlying Clinical decision support system and clinical guidance
- Pharmacy orders verified by a pharmacist before dispensing a unit dose
- Use of bar coding at the point of care the

patient and medication (unit dose or sachet) must be bar coded

"5 Rights" of closed loop medication administration – the right patient, right drug, the right dose, the right route, and the right time

Different types of IT solutions are being leveraged to address medication errors at different stages of medication use, e.g. Dispensing, administration and monitoring together account for more than 75% of medication errors. A trackand-trace technology known as radio-frequency identification (RFID) which uses radio waves for data collection and transfer is revolutionizing medicine management. By using this method, an RFID tag is attached to uniquely identify each vial, syringe, and drug. RFID tags can compare the patient's medications, identify the patient, and synchronize the patient's registration in the electronic healthcare record (EHR). With this approach, drug use faults such as mismatch, overdose, or misapplication can be prevented, thus lowering the risk of human errors, and,

Stages of Medication Use	Technology Type Examples	Application
Prescribing	Smart Medical Transcription	Addressing treatment errors committed while taking a patient's history or failures to include an essential part of the prescription.
Transition	Next-gen Medication Reconciliation and eRx Solutions, RFID	Identifying the most accurate list of medications and improving patient-doctor engagement. Record patient and medication use data.
Dispensing	Automated Dispensing Cabinet, RFID	Automated, safe handling, storage, and distribution of medication.
Administration	eMAR, Closed loop medication management (CLMA), Smart infusion pumps, Medication Cart	Automated checks during the transfer of patients' essential information to ensure correct medication.
Monitoring	Automatic Pill Dispenser	Automated organization and tracking of medication usage by patients.

consequently, adverse drug events (ADE). Also, the reduction in time-consuming, manual record-keeping procedures helps improve clinical workflow. Advantech's automated dispensing cabinet is an excellent example of a medication management solution leveraging advanced RFID technology, each of Advantech's RFID medication bin can be paired with medication or patient information, which can then be tracked/ monitored during the whole medication dispensing/transition process.

Automated dispensing cabinet for point-ofcare eMedication

Hospitals have a high number of patients on medication, and usually, medication errors occur due to the high workload of the healthcare staff. Thus, it's important to ensure the automation of most of the administrative and simple care tasks to both reduce manual errors and free up healthcare staff time for providing better patientfocused care. An automated dispensing cabinet helps to manage and keep an eye on the distribution of medications to ensure that the right medication is given to the right patient in the right dose. Additionally, improved patient safety, medicine inventory accountability, more effective billing procedures, and higher patient and nurse satisfaction are all advantages of automated dispensing cabinets.

Companies like TouchPoint Medical, Capsa Healthcare, and Advantech provides different configurations of automated dispensing cabinets to fit requirements from hospitals. For example, Advantech offers compact and large ADC to help hospitals in streamlining medication management, visualizing medication information, and easy integration in any size of healthcare settings.

Additionally based on hospital requirements, Advantech also offers customized and total closed loop medication administration (CLMA) solution in form of AMiS-8 series which includes an medication cart, unit dose medication cart, and RFID bin setting station, that can be integrated at hospital level IT system. Several hospitals in Asia Pacific region have successfully adopted such eMedication management solutions for improved patient safety and care efficiency.

In summary, the adoption of automated eMedication management systems like the AMiS-8 series is anticipated to become increasingly necessary over the next decade as patient safety and satisfaction metrics are given more weightage in hospital service evaluations. Not only will the medication challenges be solved by technology, but the workflow and care process are also anticipated to be improved.

The CLMA solution offers a positive workflow impact across its key hospital stakeholders:

Pharmacist—helps with enhanced security, accessibility, and inventory control of medication and prevents supplies loss and drug diversion, and allows for more efficient medication billing.

Nurse—improves access to medication, helping them spend less time on medication management and more time on patient care.

Administrator—offers greater medication security, quick onboarding for new caregivers, easy to integrate.

FROST & SULLIVAN

Improving Medication Safety Medication Administration Solution

Advantech's eMedication solution streamlines medication inventory and dispensing at hospital pharmacies, nursing stations, and patient wards. This solution helps caregivers minimize medication errors and increase patient safety.

- ▶ RFID-based medication bins with individual mechanisms.
- Medication software API can be integrated with electronic medical records.
- Offers secure access and control of all medications.
- All medication usage records can be traced.





AMIS-810 RFID Bin Setting Station

AMiS-850T Compact ADC

AMiS-850C Medication Cart



AMiS-830 UD Medication Cart



AMiS-870 Stationary ADC

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intel.
partner
<sup>Titanium</sup>
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Product Page



Enabling an Intelligent Planet

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Driving Thai Hoa Hospital's Transformation into Vietnam's First Smart Hospital

Photo Provided by Thai Hoa Hospital

Interview with Pham Viet Thai, an investor of Thai Hoa Hospital; Nguyen Bang Phuong, Deputy Director of Thai Hoa Hospital; and Nguyen Thi My Dieu, a Nurse of Thai Hoa Hospital

To resolve medical resource shortages and improve medical service quality, Thai Hoa Hospital collaborated with Advantech to successfully build Vietnam's first smart hospital, demonstrating the country's commitment to moving forward into the smart healthcare era.

Challenges posed by inadequate software in the transformation of a smart hospital

Thai Hoa Hospital embarked on a mission to enhance the patient experience while creating an operating model that would be sustainable in the future. Although the hospital was already fitted with modern equipment and was staffed by a strong team of highly qualified doctors who used HIS and LIS systems in their daily work, the hospital faced challenges with their old patient management software. Pham Viet Thai, an investor of Thai Hoa Hospital, pointed out that the hospital's software had limited features and was unable to merge data, which impacted patient satisfaction and staff workflows. Additionally, without a picture archiving and communication system (PACS), the hospital had to spend a significant amount of money on paper and film for test results, ultrasounds, and X-ray film.

During the construction of a new 100-bed hospital in Ninh Thuan province, Pham Viet Thai was introduced to Advantech's smart hospital solutions. Impressed by the technology's potential to expedite the digital transformation of the hospital, he decided to collaborate with Advantech Vietnam, propelling Thai Hoa Hospital toward

Advantech is a great choice; they have enthusiastic and professional staff. We are now an outstanding hospital thanks to their intelligent solutions.

- Lham Viet Thai, Investor in Thai Koa Kospital.

Case Study Benefits

- 1. Enhanced patient experience
- 2. Centralized data management
- 3. Improved operational efficiency



its smart development goals. By implementing Advantech's intelligent hospital solutions, the hospital now has innovative systems and data-driven processes that have improved overall operations.

Advantech's comprehensive intelligent healthcare solutions

Advantech's comprehensive solutions for deployment in hospitals include access control systems (ACS), computerized medical nursing carts (AMiS), integrated intelligent operating room systems (AVAS), telehealth solutions (iTeleMed & AMiS), pharmacy management systems, and high-end smart inpatient solutions (iWard).

Nguyen Bang Phuong, Deputy Director of Thai Hoa Hospital, highlights the significant impact of the AVAS solution on surgical precision and safety achieved by providing doctors with direct access to patients' medical history, ultrasound records, and test result data prior to surgery. The system offers real-time data transmission with 4K resolution and zero latency, enabling Thai Hoa Hospital to collaborate with outside doctors on surgeries. This technology contributes to the advancement of healthcare in Ninh Thuan Province.

Additionally, the iTeleMed Solution with AMiS Telehealth cart is a remote medical system that enables doctors and nurses to transmit patient data, including vital signs and medical images, via Advantech's telehealth suitcase. This allows doctors from anywhere to receive data, thus streamlining the consultation process.

Thai Hoa Hospital has implemented iWard Patient Information Terminals (iWard PITs) on their boarding beds, contributing to enhanced patient engagement and improved healthcare outcomes. Mr. Nguyen Bang Phuong elaborated that these terminals display patient data directly on the screen during visits, eliminating the need for doctors to carry paper records. Medical staff can also access patient information remotely through the iWard solutions on the AMiS Nursing cart, thus helping facilitate patient diagnosis.

Revolutionizing patient care and operations

Advantech's Intelligent Healthcare Solutions have transformed onsite operations at Thai Hoa Hospital, enabling the hospital to offer a new and improved experience for patients, doctors, and nurses. Doctors and nurses can now provide more effective treatment and care using smart technologies. Ms. Nguyen Thi My Dieu, a nurse at Thai Hoa Hospital, pointed out that these digital solutions have helped significantly, especially in reducing medical errors, making patient information clearer, and providing remote access to support patients from any location.

The implementation of the intelligent system has also brought significant benefits to patients, particularly through the automatic receipt and transmission of electronic medical records. This streamlined process has facilitated smoother collaboration with third parties, including insurance companies. Moreover, it positions Thai Hoa Hospital for future expansion and development. In line with this, the hospital is actively planning the deployment of Phase 2 of the intelligent hospital solutions, which will further enhance its capabilities. This strategic move ensures the hospital's continued growth, development, and the provision of more advanced and intelligent healthcare services. ■

EUCALIA TOUCH Bedside Terminals to Optimize Patient Care

Photo Provided by EUCALIA Interview with Takehito Shiromae, EUCALIA TOUCH Unit Manager of EUCALIA

Many of the current challenges facing the healthcare sector stem from increasing life expectancy and global staff shortages. These issues contribute considerably to rising medical costs and the high workloads of healthcare professionals. Accordingly, in an effort to reduce costs and improve service quality, many hospitals have implemented digital technologies. These include electronic medical record (EMR) systems, self-checkin kiosks, and telehealth solutions designed to improve patient experiences.

Increase efficiency with innovative bedside solutions

Founded in 2005, EUCALIA is a Japanese healthcare solutions provider and consultancy firm that collaborates with medical institutions and elderly care facilities to optimize their management and technology infrastructure. In line with its corporate mission to realize "ideal medical care" through digital transformation, EUCALIA has developed several innovative healthcare solutions, including their flagship product – the EUCALIA TOUCH bedside information terminal.

According to Takehito Shiromae, Product Manager for EUCALIA TOUCH at EUCALIA, the terminal is compatible with all major EMR systems in Japan. EUCALIA TOUCH terminals can be seamlessly integrated with various hospital systems to enable healthcare staff to access patients' medical history and test results at the bedside. The terminal interface is designed to assist with the provision of care by using easily recognized icons to indicate patients' current health status and treatment protocols. These pictorial symbols help staff quickly understand the doctor's treatment instructions and whether patients have conditions that require specialized care, such as hearing impairment or diabetes.

Although users provided positive feedback, the first iteration of the EUCALIA TOUCH terminal encountered frequent malfunctions and breakdowns. This was attributed to excessive pressure placed on the touch panel during routine cleaning in accordance with hygiene and infection control protocols. Additionally, maintenance and replacement efforts were hindered by restrictions on hospital access and ward entry.

Therefore, to ensure reliable hospital services, EUCALIA needed a durable information terminal that could be embedded in bedside cabinets for 24/7 operation. Advantech proposed its HIT-W101 healthcare information terminal with customizations to satisfy hospital requirements, integrate the EUCALIA TOUCH interface, and accommodate future upgrades. HIT-W101 is a flexible medical-grade all-in-one computer with

Case Study Benefits

- 1. Improved operational efficiency with wireless data transmission
- 2. Improved medical safety with on-demand access to EMRs and digital patient education
- 3. Increased patient and staff satisfaction with greater information transparency

Advantech Products and Solutions

- 1. Freescale[™] i.MX6 A9 quad-core processor
- 2. 10.1" 16:10 widescreen display with multi-touch PCAP control
- 3. Compatible with Android and Linux operating systems
- 4. Optional RFID/NFC/Wi-Fi/Bluetooth modules and peripherals
- 5. Backlight with automatic adjustment to patient schedules



EN 60950 and EN 60601-1-2 certifications as well as multiple rear-access I/O and RFID/NFC/Wi-Fi/Bluetooth options for convenient connectivity. The 10" front panel is IP65 rated for protection from water and dust ingress, which facilitates regular cleaning and sanitation.

Streamline workloads and improve staff and patient satisfaction

Kumamoto Orthopedic Hospital, a patient-centric acute care hospital in Japan, recently adopted EUCALIA TOUCH terminals to improve medical safety and increase operational efficiency. In acute care hospital departments, patients' vital sign measurements must be frequently recorded. Medical staff are also responsible for carrying out numerous tasks related to patient care and healthcare education. EUCALIA TOUCH terminals help to simplify these tasks by providing ondemand access to EMRs and treatment information at patient bedsides. This improves both staff and patient satisfaction by streamlining data exchanges and allowing patients to check treatment information themselves, increasing the transparency of healthcare information and improving operational efficiency.

Mr. Shiromae estimates that for hospitals with 500 beds, EUCALIA TOUCH terminals can save an average of 10,000 work hours per year. Moreover, with Advantech's HIT-W101 hardware, EUCALIA TOUCH terminals provide a "fit and forget" solution. Compared with previous models, terminals based on HIT-W101 deliver the highest stability and lowest failure rate. For hospitals, this means increased system availability and reduced maintenance costs. For EUCALIA, this means more satisfied customers and more freedom to focus on promoting EUCALIA TOUCH terminals. To date, more than 12,000 EUCALIA TOUCH terminals have been installed in healthcare facilities throughout Japan, with many more planned for the future.

Ramkhamhaeng Hospital Implements eMedication Solution to Enhance Patient Safety

Photo Provided by Ramkhamhaeng Hospital Interview with Dr. Patrick, Board of Management of Ramkhamhaeng Hospital

Explosive growth in both data and information technology use has led to the development of eHealth systems in many countries. eHealth is aimed at improving the accessibility and quality of care in health systems using information and communication technologies (ICTs). This, in turn, helps healthcare providers do their jobs more efficiently and cost-effectively.

Over the last two decades, the Ministry of Public Health in Thailand has implemented projects and policies aimed at improving the quality and accessibility of healthcare. These policies include Universal Health Coverage (UHC) and a nationwide Electronic Health Record (EHR) system. As a result, by 2019, Thailand had 66 hospitals accredited by Joint Commission International (JCI), including Ramkhamhaeng Hospital – one of Advantech's partners.

System integration: flexibility to fit any clinical workflow

Ramkhamhaeng Hospital, which is among the topfive largest private hospital groups in Thailand, has a dedicated IT team and their own Hospital Information System (HIS). They sought solutions for integration into the existing HIS that reduce medication errors and improve healthcare service in the Inpatient Department (IPD). Medication management is a complex and multifaceted operation that involves numerous people and



Case Study Benefits

- 1. Improved medication safety
- 2. Enhanced nursing workflow
- 3. Optimized patient care

Solution and Benefits

Advantech's AMiS-850T is a compact automated dispensing cabinet with 16 lockable medication bins. It adopts RFID technology to ensure strict access control and tracking. This improves medication safety and enhances nursing workflows. This solution also helps reduce the workload of nurses. In sum, it eliminates repeat visits to the pharmacy, improves patient safety, and provides more patient-centric care. steps. In general, medication errors most often occur during the documenting, transcribing, dispensing, administering, monitoring, and ordering or prescribing stages. Ramkhamhaeng Hospital's use of the ePrescribing HIS has minimized the risk of medication errors at the prescribing stage. However, neither nursing workload nor medication errors were reduced by any significant amount in IPD. Dr. Patrick, who sits on the Board of Management of Ramkhamhaeng Hospital, said that the hospital would like to improve nursing workflows and enhance medication safety in inpatient wards. He hopes to achieve this using intelligent medication devices connected to the existing HIS.

To this end, the hospital began evaluating and testing products from several suppliers. They soon found that many products had issues related to workflow compatibility, a lack of system integration flexibility, and high total cost of ownership. They also discovered that some solutions were not designed for intensive IPD usage — particularly in terms of durability and ergonomics.

The AMiS-850T Compact Automated Dispensing Cabinet was introduced to Ramkhamhaeng Hospital following Advantech's visit in late 2019. Administrators were impressed by its reasonable price, durability, RFID technology, and flexibility of system integration. Advantech's support team used Open APIs to integrate AMIS-850T into Ramkhamhaeng Hospital's existing HIS without changing their workflow. This helped empower the hospital's health IT team.

Secure medication management in healthcare settings of any size

AMiS-850T Compact Automated Dispensing Cabinet optimizes nurses' workflow by eliminating repeat visits to the pharmacy and distributing/storing medications safely near points of care. Designed with 4 tiers and capacity for 16 lockable medication bins, it is ideal for healthcare environments with limited installation space. AMiS-850T is also scalable for up to 6 units. This produces a futureproof solution that fits diverse healthcare applications of varying sizes.

Each medication bin uses RFID technology to encode patient and medication IDs. RFID technology also enables individual bin locking and tracking for strict access control. Medical staff can use AMiS-850T to pair medication bins with patient information or medications through the software system. This can be customized by Open API provided by Advantech. The medication is then locked in its isolated medication bin and can only be accessed by authorized personnel. Each time a medication bin is accessed it is recorded automatically on the HIS. This serves to help hospitals track medications and streamline paperwork.

The implementation of AMiS-850T at Ramkhamhaeng Hospital not only reduced medication errors but also relieved pressure placed on inpatient department (IPD) nurses. This, in turn, enabled them to spend more time on patient care. This partnership between Advantech and Ramkhamhaeng Hospital led to greater medication security while providing more patientcentered care.

Pingtung Veterans General Hospital Ensures Medication Safety in Southern Taiwan

Photo Provided by Pingtung Veterans General Hospital Interview with Tong-Lin Wu, Director of Pingtung Veterans General Hospital; Chiu-Yu Liu, Deputy Director of the nursing department of Pingtung Veterans General Hospital



Pingtung County has one of Taiwan's fastest-aging populations, and demand for healthcare in southern Taiwan has become a pressing issue. In the past, residents of the area sought treatment in Kaohsiung, a city with more medical resources. This required them to drive between 30 minutes to 2 hours. Opened in November 2022, Pingtung Veterans General Hospital is using innovative medical technology to improve medication safety and transform the area's healthcare landscape.

Medications are traditionally dispensed manually. This requires multiple verifications and is taxing on human resources. Pingtung Veterans General Hospital chose to delegate some tasks to intelligent technology. This frees up resources and ensures medication safety by



decreasing the risk of human error. In this case, the hospital adapted Advantech's eMedication Solution — which comprises the AMiS-810 RFID Bin Setting Station, AMiS-830 UD Medication Cart, AMiS-850T Compact Automated Dispensing Cabinet, AMiS-850C Medication Cart, and iMedication Software. This combined solution enables closed-loop medication management — from the pharmacy to bedside administration.

Automated pairing of patient information with medication bins ensures accuracy

The pharmacy in Pingtung Veterans General Hospital utilizes the AMiS-810, AMiS-830, and iMedication Software to place the medication into corresponding medication bins for quick and accurate administration.

Dr. Fang Rou-Yi, Director of the hospital's pharmacy, elaborated on the current medication dispensing process. Every morning at 11:30, the hospital performs batch processing for inpatients. This



Case Study Benefits

- 1. Improved medication accuracy and safety
- 2. Reduced medical staff workloads
- 3. Enhanced patient-centric care services

includes printing medication bags for later distribution. These prepared bags are placed into medication bins, and loaded onto the AMiS-830 UD Medication Carts. These carts are then delivered to nursing stations in different parts of the hospital at 3:30 p.m.

It is possible that doctors may need to update or change treatments during this 3-hour window and they may ask pharmacists to dispense different medications. In such cases, tight schedules may lead to confusion which can cause errors and result in the wrong medication being dispensed. Pharmacists at Pingtung Veterans General Hospital now use Advantech's solution to track orders and avoid human error during dispensing.

In addition, the AMiS-810 RFID Bin Setting Station uses ePaper technology to display patient information. The RFID and ePaper application ensures patient safety and medication accuracy and is more reliable than writing the information on a piece of paper and taping it to a cart.

Clinical administration of anesthetics made convenient, safe, and compliant

After leaving the pharmacy, the AMiS-830 heads to nursing stations on each floor. Nurses then transfer the medication bins from the AMiS-830 to the AMiS-850C. After that, they start giving the medication to patients. This is confirmed by scanning the barcode on a patient's hospital bracelet. After scanning, the AMiS-850C will eject the patient's medication bin automatically. This ensures the right medication is given to the right patient.

In addition to general medication management, the nursing station also utilizes the AMiS-850T Compact Automated Dispensing Cabinet to help improve the safety of anesthesia. Chiu-Yu Liu, Deputy Director of the hospital's nursing department, said that doctors need to prescribe specific anesthetics according to patient needs. However, most anesthetics are controlled substances and it is not permitted to have them stored in "

Regardless of the smart applications that are implemented, improving patient satisfaction, reducing staff workload, and ensuring patient safety are Pingtung Veterans General Hospital's goals in the pursuit of intelligentization.

- Tong-Lin Wu, Director of Lingtung Veterans General Hospital

easily accessible locations. When such medications are administered, strict regulations on their use of must be followed. This requires drug retrieval and administration to be performed by two nurses.

In the past, Pingtung Veterans General Hospital used a cabinet enclosed within a cabinet. This meant two nurses had to open two locks simultaneously in order to retrieve the anesthetics. This method was prone to problems — such as nurses forgetting to bring the keys, key breakage or loss — and did not enable nurses to leave a record of medication retrieval. The implementation of the AMiS-850T has helped resolve these problems.

Chiu-Yu Liu explained that each bin in the medication cabinet only contains one type of anesthetic, and the ePaper display on the outside of the medication bin shows the name of the required drug and dosage. When nurses need to obtain anesthetics, they can simply click on the drug's name on the computer screen. After that, the AMiS-850T will automatically eject the medication bin containing what they require. This method is both convenient and safe, and leaves a record of administered medication ensuring that the process of obtaining medication complies with regulations on controlled drugs.

Customized user-centric design maximizes benefits

Both Director Liu and Dr. Fang believe that Advantech's eMedication solution is effective both

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because of Advantech's hardware and because Advantech engineers took feedback into careful consideration. They made sure they understood the actual workflow before readjusting the system and hardware design.

Pingtung Veterans General Hospital intends to implement many other intelligent transformation plans after implementing intelligent medication management and taking the first step toward healthcare intelligentization. Indeed, they plan to establish a platform for measuring patients' physiological information, allowing the system to monitor patient conditions and provide real-time warnings. This integration of hospital data into a single platform will help provide real-time information about hospital procedures. Tong-Lin Wu, Director of Pingtung Veterans General Hospital said, "Improving patient satisfaction, reducing staff workloads, and ensuring patient safety are the goals of Pingtung Veterans General Hospital. This holds true regardless of the smart applications used in the pursuit of intelligentization."

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Product Page

Improving the Efficiency and Accuracy of Gross Processing with a Pathology Digital Imaging System

Photos provided by Milestone Interview with Danilo Treno, iHealthcare Key Account Manager of Advantech Europe

In the field of anatomic pathology, pathologists play a critical role that goes beyond just diagnosis. Milestone corporation is dedicated to assisting patients, which is why they develop technologies aimed at enhancing the documentation of crucial steps in the journey of a specimen, leading to more accurate diagnoses.

Streamlining the gross pathology process

In 1994, Milestone, a corporation that specializes in advanced instrumentation for analytical and organic chemistry labs, expanded its expertise into histopathology. Just a few years later, they pioneered the first grossing pathology camera system. Diagnosis in histopathology heavily relies on the visual examination of biopsy materials and excised gross specimens. However, to ensure accuracy and efficiency, a variety of data factors excised can come into play.

Milestone developed the MacroPATH digital imaging system to improve grossing efficiency and accuracy, and to eliminate inaccuracies in descriptive reports. The system integrates user-friendly pathology software, an enclosed industrial video camera, and Advantech's POC-6 series of medical-grade point-of-care (POC) terminals. Recognizing the importance of staying up to date with technological advancements, Milestone is currently in the process of upgrading to the POC-6 series. This transition includes a shift from a 4:3 to 16:9 aspect

Case Study Benefits

- Enhanced visualization with highquality digital images and videos of gross specimens
- 2. Hands-free control of the gross pathology digital imaging system
- 3. Improved accuracy and reliability of reports
- 4. Streamlined grossing workflow and automated routine tasks
- 5. Seamless transfer of data and reports to laboratory information systems

Advantech Product Features

The POC-6 series comprises compact, ultra-thin terminals with high customization flexibility. For this project, the terminal case was modified to fit Milestone's grossing pathology station design.



ratio display, setting up the adoption of Advantech's POC-6 series for the next generation of MacroPATH system.

Milestone emphasizes that the MacroPATH grossing pathology imaging system is an advanced solution that simplifies the documentation process of gross specimens, enabling the immediate capture and storage of highresolution digital images and videos. This system includes useful features such as a location indicator for sample excisions, a microphone for voice notes, and editing tools, empowering pathologists to visualize even the most subtle details of specimens effectively. Additionally, the MacroPATH system stores all gross pathology macroscopic images, making it an indispensable diagnostic database for teaching, research, and guality assurance purposes.

MacroPATH facilitates collaboration among healthcare professionals by facilitating image sharing and enabling collaborative diagnosis and treatment planning. The system offers the convenience of a foot pedal and the innovative LOOX eye-tracking system to



offer hands-free control of the main functions. These combines features make MacroPATH an efficient and user-friendly tool that simplifies and expedites the documentation procedure.

Medical-grade computing solution for pathology laboratories

The POC-6 series is specifically engineered for deployment in grossing areas, where exposure to pollutants, chemicals, and liquids poses a risk to electronic equipment. To address these challenges and ensure equipment safety and longevity in this type of environment, the POC-6 series is equipped with an IP65-rated front panel, which is environmentally sealed in a specially designed plastic case. Additionally, the POC-6 series is compliant with IEC 60601-1 medical safety standards, ensuring that electrical devices used in medical settings meet the necessary safety requirements for the well-being of patients and staff.

The POC-6 series terminals have a compact, ultrathin, all-in-one design, making them ideal computing solutions for pathology laboratories, where space on the grossing station is often limited. These terminals are equipped with an 11th Gen Intel® Core™ i7-1185G7E processor, which provides high-performance computing for seamless operation of Milestone's pathology software and add-ons. These add-ons include cameras, barcode scanners, and foot pedals, as well as the ability to communicate with laboratory information systems.

Danilo Treno, iHealthcare Key Account Manager from Advantech Europe stated, "Milestone and Advantech have been working together for almost two decades, and Advantech's local support, long-term product commitment, and adherence to relevant healthcare regulations are the primary factors in their continued collaboration to develop new products."

Improving Operational Efficiency and Patient Safety with POC Solution

Interview with Jerome Marron, Key Account and Export Manager of Mdose

Digital transformation and advancements in medical technologies are revolutionizing healthcare by improving operational efficiency, enhancing patient safety, and reducing the cost of care. As such, hospitals are experiencing increasing demand for operating rooms (ORs) equipped with advanced medical devices that can be installed in confined spaces, including anesthesia machines, endoscopes, imaging systems, patient monitors, and OR integration systems.

POC terminal for diverse healthcare applications

Jerome Marron, Key Account and Export Manager of Mdose, highlighted the distinctive features of medical spaces such as ORs and ICUs compared to regular office environments. In these spaces, strict hygiene and infection control protocols are essential, and there is often no dedicated workspace such as a desk available. Therefore, an all-in-one computing terminal that offers mobility and versatility is crucial. Additionally, both health practitioners and electronic equipment face constant exposure to fluids and pollutants such as blood and chemicals. For these reasons, an all-inone medical computing solution that enables gloved operation and guarantees high performance, reliability, and durability is the optimal choice for healthcare IT applications.

Mdose, a French company specializing in healthcare IT solutions, has combined its ergonomic and practical mounting solutions with Advantech's POC-6 series of medical-grade point-of-care (POC) terminals to create

POC-6 Terminal Benefits

- 1. Fulfills IT requirements for anesthesia in OR settings
- 2. Reduces the workload and eliminates errors associated with manual recordkeeping
- 3. Enhances operational efficiency and patient safety
- 4. Improves connectivity and interoperability in the OR

Advantech Product Features

The front panel of the POC series is IP65-rated, and the entire system has an IP54 rating, which provides superior protection against dust and liquid ingress and supports regular sanitization with disinfectants and sanitizing agents. Healthcare professionals can rest assured that these POC series terminals can withstand the rigors of their demanding work environments.



a universal and flexible workstation that is well-suited to various medical spaces and healthcare applications.

Maximizing operational efficiency and enhancing patient safety

Advantech's POC-6 series terminals are environmentally sealed in a speciallydesigned plastic enclosure that enables regular sanitization with a variety of disinfectants and agents. Compliant with IEC 60601-1 medical safety standards for electrical devices, POC-6 terminals are built for reliable operation in a wide range of healthcare environments. Equipped with an 8th Gen Intel® Core[™] i5/i7-8665UE processor and NVME SSD, the POC-6 series deliver high-performance computing to maximize operational efficiency in busy and stressful OR environments.

Due to the nature of ORs, they have more stringent hygiene requirements than other medical spaces and are often cramped with many medical devices. Thus, the fanless design of the POC-6 terminals is highly effective in preventing dust and bacteria circulation. The inclusion of isolated COM and LAN (1.5 kV) ports also protects against electromagnetic interference or leakage, ensuring safe integration with existing infrastructure and equipment.

By connecting POC-6 terminals with vital sign monitors and digital syringe pumps, Mdose has helped many hospital ORs fulfill their anesthesia IT requirements. By partnering with an anesthesia software provider, the anesthetic monitoring solution allows anesthesiologists to observe the vital signs of patients such as cardiac activity, blood pressure, respiration, oxygen saturation, and temperature. It also helps in administering anesthetic medication—all from the touch screen of the POC terminal.

Another critical aspect of patient care is intraoperative record-keeping, and POC-6 terminals offer nurses a powerful tool to manage this task more efficiently. These records contain vital information about a patient's response to anesthesia, intraoperative events, and medications. This is crucial because any errors or inadequacies can have severe consequences for patient safety. In the highly stressful and often fast-paced OR environment, nurses need to be able to focus on patient care without worrying about paperwork. By automating data processing, POC-6 terminals can significantly reduce workloads while eliminating errors associated with manual record-keeping.

Mdose works closely with a large network of healthcare system integrators. Currently, a staggering 70% of anesthesia applications use Advantech products, highlighting the company's strong presence in the healthcare industry. Mr. Marron commented that despite significant investment in digital transformation in the French healthcare sector over the past decade, many hospitals and clinics have yet to adopt healthcare IT solutions. In light of this, Mdose is committed to expanding its market share by helping more healthcare institutions leverage the benefits of digital transformation while looking to promote its POC terminals to industrial users, including pharmaceutical, biotech, and pathology laboratories. These sectors require strict contamination and infection control protocols, and Mdose POC terminals can provide them with reliable and efficient solutions.

Revolutionizing Vital Sign Monitoring with a Continuous, Contactless Solution

Photo Provided by VitalThings Interview with Trond Hakon Trondsen, Business Developer of VitalThings

Continuous monitoring of vital signs of patients at a large scale poses challenges when using traditional methods. Patients are typically tethered to bedside devices with wires, which limits their mobility and exacerbates discomfort. Additionally, the process of attaching and removing sensors from patients is time-consuming. Meanwhile, intermittent monitoring makes it difficult for healthcare professionals to promptly identify any deterioration in a patient's condition. To address these challenges, St. Olavs University Hospital forged an innovative partnership with VitalThings and DNV Imatis. The objective of this collaboration was to develop a continuous, contactless medical monitoring solution capable of real-time visualization of vital signs and triggering alarms when necessary.

VitalThings collaborated with Advantech to integrate the HIT-512 Medical-Grade Information Terminal with their radar and sensor technology, resulting in the creation of VitalThings Guardian for Project Autoscore. This innovative solution provides a continuous and contactless monitoring system capable of accurately measuring vital signs such as respiration, pulse, SpO2, and presence. By utilizing this technology, healthcare professionals are empowered to deliver proactive care and interventions, ultimately leading to enhanced patient outcomes.

HIT-512 Medical-Grade Information Terminal helps speed up the certification process

The initial challenge in this project involved the

monitoring system that could meet the requirements for EU MDR (European Medical Device Regulation) certification. To mitigate regulatory risks and prevent common errors, the team sought assistance from experienced consultants. This decision facilitated effective communication with relevant regulatory bodies in a streamlined and timely manner. Additionally, Advantech played a crucial role by providing the required information for medical certification. The fact that HIT-512 had already obtained pre-certification for medical applications expedited the regulatory process for EU MDR certification. The second challenge in this case centered on the need for a display to visualize data and trigger alarms. Advantech stepped in and successfully addressed this requirement by modifying the appearance of the HIT-512 through the design of a customized molding tool. Their competitive pricing, seamless cooperation, and esteemed global reputation played a vital role in enabling VitalThings to overcome challenges, make necessary adjustments, and establish a successful partnership.

development of a contactless medical

Features of HIT-512

- 1. Incorporates USB Type-C power delivery for external devices.
- 2. Complies with European Medical Devices Regulation (MDR) requirements.
- 3. Waterproof design for infection control.
- Easy, lightweight carry-on size with diverse I/O to deliver hardware/ software flexibility and customization as well as mobile applications.
- 5. Guarantees product longevity and long-term software support.
- 6. Over-the-air firmware upgrade and fleet management.

Case Study Benefits

- 1. Helps identify health deterioration at an early stage.
- 2. Visualizes vital sign data and triggers alarms.
- 3. Enables proactive care and early intervention.



Contactless vital sign monitoring improves healthcare

St. Olav's University Hospital recognized the extensive potential of contactless vital sign monitoring across various applications. Initially, their intention was to implement the VitalThings Guardian M10 system in the emergency room, enabling contactless, continuous, and automatic measurements. Since emergency room occupancy can change a lot throughout an average day, optimizing staffing can be challenging. By utilizing a system that doesn't require sensors to be attached to patients' bodies and can operate autonomously without nurse intervention, a higher level of monitoring can be achieved, even during demanding periods. Additionally, patients no longer need to be concerned about mobility restriction caused by cords. More importantly, the collection of patient physiological data becomes more accurate and reliable.

The VitalThings Guardian M10 system offers significant advantages in respiratory monitoring. Traditionally, the standard of care involves observing a patient's chest movements to assess their respiratory status. However, manually counting is prone to inaccuracies and is a time-consuming process. Human errors can further compromise the reliability of these measurements. Mr. Trond Hakon Trondsen, Business Developer of VitalThings, pointed out that respiratory depression is a common side effect of opioid medication and often the first vital parameter to be affected after receiving





medication. By utilizing VitalThings Guardian M10, potentially life-threatening situations can be avoided, and medication can be adjusted promptly based on a patient's vital parameters.

Improved patient safety, enhanced work conditions for nurses, and reduced healthcare costs

One application of the solution involves postoperative and orthopedic patients, where hospitals currently rely on intermittent checks of vital signs. With the implementation of this solution, nurses are now able to assess the condition of each patient and receive early warnings of any health deterioration without the need to physically enter the patient's room. This leads to improved patient safety and work conditions for nurses while also avoiding having to wake patients during the night. Furthermore, the solution proves especially beneficial for patients who may be sensitive to the presence of numerous cables, including psychiatric patients, children, and those suffering from dementia.

The VitalThings solution has already been implemented in St. Olav's hospital, which has a 20% share of the Norwegian market. The solution has garnered significant interest from physicians and other hospitals not just in Norway, but also in the UK, Australia, and Italy. The underlying technology of the VitalThings Guardian M10 system is also employed in elderly homes with Somnofy—another VitalThings product. This versatility makes it suitable for a range of welfare applications, including remote monitoring, home hospitalization, and psychiatric care.

Continuous monitoring brings significant benefits to patients, as supported by various studies. It has been found to contribute to a reduced risk of mortality, decreased necessity for transfers to intensive care units, fewer calls to emergency response teams, and shorter hospital stays. The inclusion of contactless features

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Advantech's competitive pricing, smooth cooperation, and global reputation ensured that VitalThings was able to resolve issues and make necessary adjustments.

- Nakon Trondsen, Business Developer of VitalThings

is also important in enabling automatic startup, saving valuable time and ensuring consistency. Additionally, contactless monitoring eliminates the need for disposable items and reduces the requirement for equipment disinfection. Moreover, contactless features facilitate uninterrupted monitoring over prolonged periods. The VitalThings monitoring solution offers a simple way for hospitals to upgrade from intermittent vital sign checks to the continuous monitoring of patients. This further improves patient outcomes, improves the working conditions for nurses, and reduces healthcare costs.

CHC Healthcare Group Accelerates HOR Development in Taiwan with Medical-Grade Solutions

Photo Provided by CHC Healthcare Group Interview with Michael Lee, COO of CHC Healthcare Group; Dr. Chia-Hsien Chen, Director of the Orthopedics Department at Hsin Kuo Min Hospital



In pursuing precision medicine, healthcare providers are transforming their operating rooms into hybrid operating rooms (HORs). These facilities combine imaging examination and surgical equipment, allowing surgeons to utilize real-time, high-quality images during operations for precise lesion localization and more accurate resection and/or interventional therapies.

Following the HOR trend, Chiu Ho Medical System, a medical equipment distributor, joined forces with Advantech in 2020 in an effort to help Taiwanese healthcare providers establish HORs. Large hospitals such as Linkou Chang Gung Memorial Hospital, Hsin Kuo Min Hospital, and Chung Shan Medical University Hospital



have all adopted Advantech's Smart Operating Room Solutions, including the Advantech Video Archiving and Streaming Solutions (AVAS), iVideOR operation recording and streaming software, and PAX medical displays. These innovative solutions streamline surgical processes, thus enhancing surgical safety and improving treatment success rates.

Advantech's medically certified products and flexibility of system integration

Chiu Ho Medical System, a subsidiary of the CHC Healthcare Group, has served the medical industry for over 22 years. It mainly represents major European and American manufacturers specializing in surgical medical equipment, including Cyberdyne exoskeleton suits, Hillrom HOR solutions, and Leica surgical microscopes. To bring the latest international medical technologies to Taiwan, Chiu Ho Medical Systems is committed to continuous innovation. To ensure optimal equipment utilization, they regularly send personnel for training overseas, enabling them to address usage issues and help doctors understand medical equipment function and operation. ננ

Advantech is a Taiwanese vendor with medically certified equipment, and its products are mature and possess a comprehensive range of functionalities. They can be customized to the clinical needs of the healthcare industry. Advantech has thus become the preferred partner for Chiu Ho Medical System in promoting HOR.

- Michael Lee, 600 of 6H6 Kealthcare Group



During its service within the healthcare industry, Chiu Ho Medical System has witnessed an increasing demand for HORs in hospitals and they have been engaging in cross-industry integration to develop smart healthcare systems. Collaborating with Advantech has been a crucial factor in helping Chiu Ho Medical System achieve their transformation objectives.

"Before collaborating with Advantech, Chiu Ho Medical System had worked with international audiovisual system integration vendors, but the process was not as smooth as expected," admitted Michael Lee, COO of CHC Healthcare Group. Other systems they tested had a closed architecture, making it difficult to adjust specifications for different healthcare institutions and departments. Moreover, when hospitals undertake the construction of an HOR, they often encounter the need to interface with their existing hospital information systems. However, the presence of time zone differences has posed a challenge in terms of collaborating with vendors from other countries. This situation has made it difficult to promptly respond to and process requests, consequently leading to delays in the implementation process.

Chiu Ho Medical System actively sought out suitable partners in Taiwan and found Advantech to be the perfect fit. Advantech stood out among the vendors due to its accomplishment of medical certification and its ability to provide highly functional products that can be customized to meet the specific requirements of the medical industry. As a result, Advantech became the preferred partner for Chiu Ho Medical System in promoting HORs.

Chiu Ho Medical System's HOR is successfully adopted in 3 large hospitals

Within a span of two years, Chiu Ho Medical System has achieved remarkable success in implementing its HORs in large hospitals including Linkou Chang Gung Memorial Hospital, Hsin Kuo Min Hospital, and Chung Shan Medical University Hospital. This achievement was made possible by leveraging Advantech's comprehensive Smart Operating Room Solutions.

A notable example of Advantech's impact

can be seen in Linkou Chang Gung Memorial Hospital, where they utilized Advantech's Video Archiving and Streaming Solutions (AVAS) during the establishment of the Da Vinci Robotic Surgery Asia Training Center. This solution seamlessly integrated the Da Vinci robotic arm, picture archiving and communication system (PACS), and surgical camera. As a result, it facilitated the flexible display of images on different screens in the operating room. Additionally, Advantech's PAX medical display, equipped with a range of I/O interfaces, supported both color and grayscale display modes, and held certification under medical safety regulations. This ensured effective fulfillment of surgical needs across various departments at the hospital.

"AVAS is an open platform that can not only integrate endoscopic images from different brands but also provide APIs for Chiu Ho Medical System to integrate Linkou Chang Gung Memorial Hospital's existing image broadcasting platform and develop more application modes," emphasized Mr. Lee. He stressed that the platform's open design was the reason Hsin Kuo Min Hospital could successfully transform its refurbished orthopedic operating room into an international teaching center.

Hsin Kuo Min Hospital initially implemented Advantech's AVAS system to transmit realtime operating room videos to the hospital's conference room. However, in response to the COVID-19 pandemic, they expanded the integration by incorporating online conferencing software. This enhancement enabled doctors to view surgical videos in real time on their computers or mobile devices, eliminating the need to physically gather in the conference room. Dr. Chia-Hsien Chen, Director of the Orthopedics Department at Hsin Kuo Min Hospital expressed satisfaction, stating, "Advantech's iVideOR software meets our needs for real-time video recording and sharing. Commonly available software now allows us to engage in telemedicine while significantly reducing the communication costs of surgical consultation."

"In addition to its open design, the AVAS platform is also highly scalable," Mr. Lee pointed out. Using the HOR at Chung Shan Medical University Hospital as an example, Mr. Lee emphasized that the current implementation of eight audiovisual systems at the hospital allows for the integration of additional audiovisual systems using an AVAS decoder. This approach provides a straightforward and cost-effective solution. In contrast, other brands would require the use of additional switches if the number of systems exceeded the switch's port capacity, which would be complex and costly.

Mr. Lee also further expressed that Advantech's responsiveness was highly advantageous throughout the collaboration. Advantech promptly provided assistance and made necessary modifications whenever any issues arose during the setup of the hybrid operating rooms (HORs). This ensured that the stringent standards and requirements of the healthcare industry were met effectively. Thanks to the successful collaboration with Advantech, Chiu Ho Medical System aims to further strengthen its presence in Taiwan while also expanding its reach into Southeast Asia. This expansion will enable more healthcare providers to enhance their HORs, highlighting Taiwan's expertise in the field of smart healthcare.

Advantech Collaborates with Microsoft to Develop Cloud-Based iHospital Solutions for Smart Hospitals

Advantech is accelerating hospital digital transformation by integrating Microsoft Azure Cloud Services into intelligent medical solutions. iWard and iTeleMed are turnkey smart solutions belonging to Advantech iHospital solutions that help healthcare providers improve operational efficiency and patient outcomes—leveraging Microsoft's Azure public cloud computing platform to ensure interoperability and rapid deployment.

Compliant with HIPAA and GDPR regulations, both Microsoft Azure and Advantech's iHospital solutions meet strict standards of data protection and information security, ensuring the deployment of cloud-based healthcare applications is secure and reliable while protecting sensitive patient data.

"With recent developments in cloud solutions, the healthcare industry is expected to undergo digital transformation into a modular ecosystem of cloud services," stated Jackson Hsu, Senior Product Manager of iHospital Solutions at Advantech. "Thanks to Microsoft's Azure platform, hospitals, medical staff, and patients will benefit from storing and retrieving data via the cloud, enabling faster deployment of digital applications for better patient-centric care."

"Microsoft focuses on providing cloudbased solutions that streamline data utilization to provide better care in the healthcare industry," added Danny Chen, General Manager of Microsoft Taiwan's Public Services Department.

With Microsoft Azure, Advantech can boost the digital transformation of healthcare with:

- **High efficiency:** Eliminates the need to invest in data centers. Advantech's iWard and iTeleMed solutions can be downloaded and run directly from Microsoft Azure, saving time and facilitating rapid deployment.
- **Data security:** Microsoft Azure complies with the highest standards of security and privacy protection in healthcare, ensuring confidentiality of patient information.
- Streamlined global deployment: Microsoft Azure helps hospitals overcome geographical limitations, making cloud-based healthcare truly global.

To date, approximately 70% of medical centers, regional hospitals, and district hospitals in Taiwan, Vietnam, Malaysia, and Japan have implemented Advantech's comprehensive iHospital solutions. With cloud-based operation of smart hospital solutions, Advantech hopes to promote the digital transformation of healthcare worldwide and reduce medical staff workloads—allowing staff to devote more time to patients for better care quality.

Transforming Healthcare with iWard Solutions

Optimize Nursing Care and Patient Engagement



Digital Transformation of Hospital Wards

Advantech's iWard solutions aid healthcare workers in providing better patient care. With highly configurable options and a user-friendly interface, iWard solutions offer clear information and interactive patient education to increase patient engagement and optimize healthcare treatment. Moreover, iWard Solutions have received HIPAA and GDPR certification, ensuring maximum security of patients' confidential information.



Enabling an Intelligent Planet



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