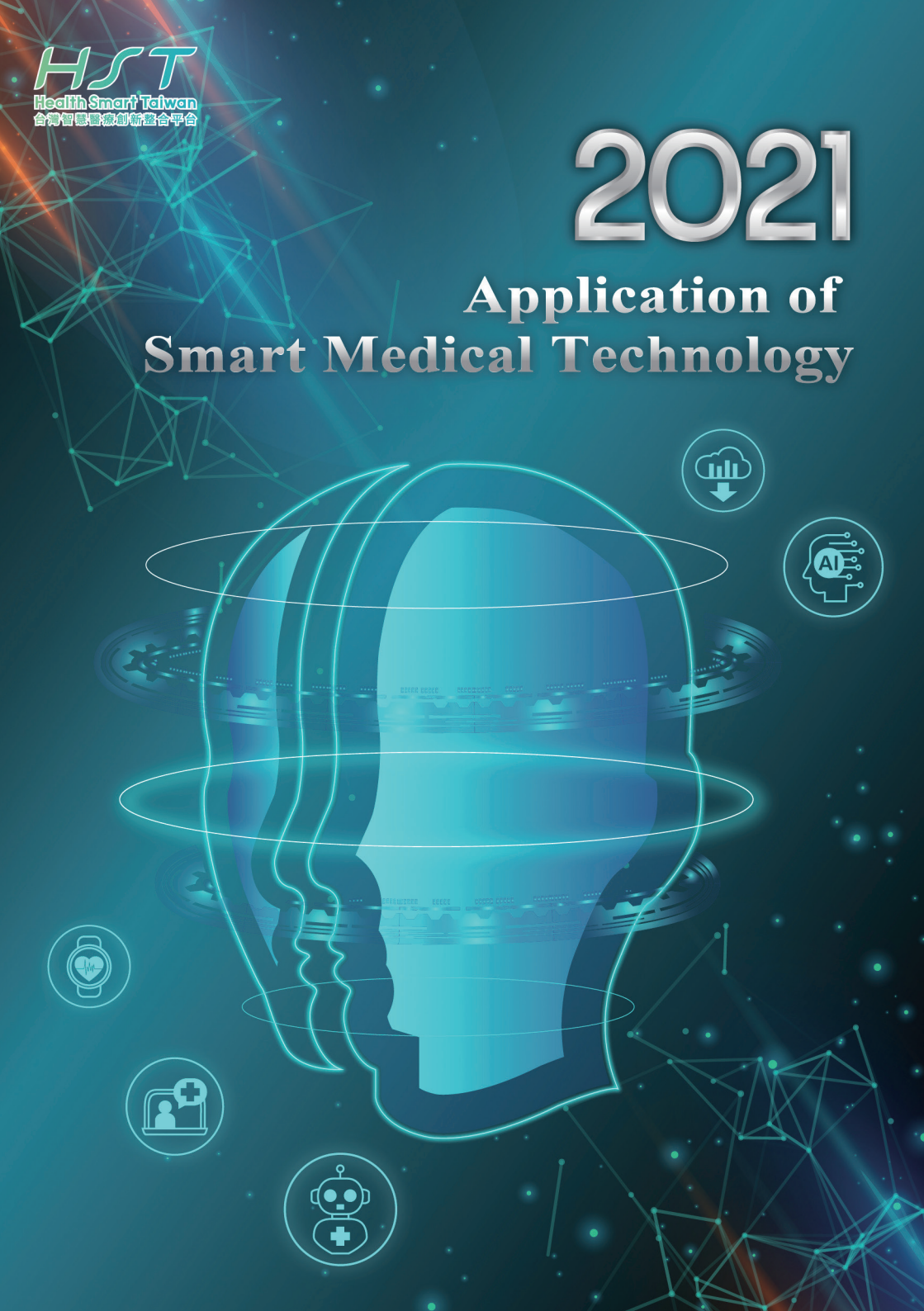
HST
Health Smart Taiwan
台灣智慧醫療創新整合平台

2021

Application of Smart Medical Technology



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Environmental Management

Tamsui MacKay Memorial Hospital

Smart Personnel, Equipment Tracking, and Real-time Inventory System

Overview

This system can be used to see the location of important devices and equipment, simplifies the medical supplies routine count process, assists with device and equipment management, increases the utilization of devices and equipment, and lowers the operating costs of departments. Bluetooth positioning and tracking is used to expand system functions for personnel to call for help. When a potential injury may occur or a security guard is needed, personnel can press the help button and their location and employee information is sent through bluetooth. Security guards will know the location through their wristband within the shortest time possible to ensure the safety of health workers.

System functions include:

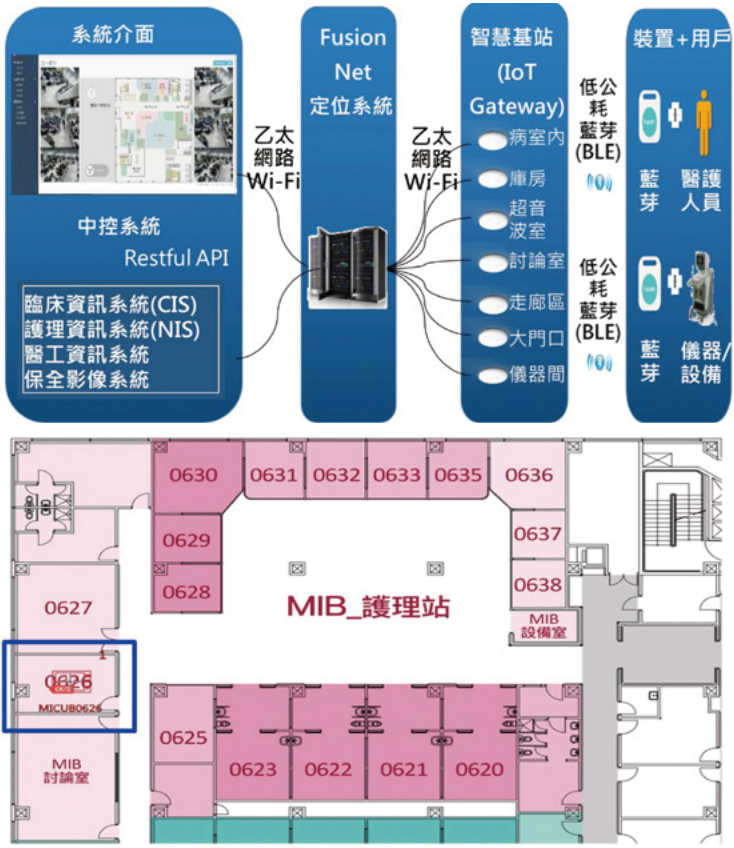
1. Automatic extraction by control equipment: It integrates the hospital's equipment management system.
2. Equipment movement management function: The location of equipment is displayed on a map, and the length of time at the location and equipment usage is determined based on entry and exit records. The system can also rapidly find the nearest equipment, and equipment not in the scope of monitoring is separately displayed in a list.
3. Violence prevention function: When healthcare workers send a signal for help, security guards are able to immediately arrive at the location to handle the situation.

Benefit

1. Economic benefit
   - Device inventory taking was shortened from 20 minutes per shift to 3 minutes.
   - Search for shared devices was shortened from 20 minutes per shift to 5 minutes.

- Able to analyze device usage, which will be referenced when making purchases in the future.

2. Increased employee satisfaction to 97%: Staffs may check the location of equipment at any time, reducing the time spent on work not related to their expertise.
3. Security guards are able to immediately help handle violence incidents, making healthcare workers feel safer at work.
4. The system sends a list of devices with low battery to notify personnel to replace the batteries and maintain positioning performance.



Press the transmitter

Receiving base station

Wristband

Terminal at the ER security counter displays the location

藍芽定位 → 請求支援 → 追蹤動態

About the Hospital

MacKay Memorial Hospital provides holistic health care through professional care services that involve multiple teams, and strives to improve healthcare quality and patient safety.

The hospital has integrated its resources to extend the reach of its services from within the hospital to communities, rural areas, offshore islands, and even the world. The hospital implemented premium healthcare and lean management, and utilizes cloud information to improve its effectiveness and capabilities, creating new value in healthcare services by transforming from a conventional hospital to smart hospital.

Keywords

Bluetooth positioning, Device positioning, Personnel and equipment tracking, Real-time inventory, Violence prevention device

Contact Details
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Environmental Management

Taipei Medical University Hospital

Smart Helper for a Good Healthcare Environment

Overview

The hospital developed the following smart solution to provide patients with friendly care and implement equipment management:

1. Parking lot license plate recognition upgrades parking services.
2. Smart transporter dispatch system improves patient transport performance.
3. The device and equipment management system monitors equipment movement online.
4. The central monitoring system – IAQ and smart server room achieves automatic environment monitoring.

The hospital's smart system takes into consideration both safety and failure prevention measures, such as: Maintenance and management mechanisms were established with vendors for different systems, and data of the device management system is routinely backed up along with hospital-wide data.

Benefit

The hospital implemented 5 systems that have all achieved significant results:

1. Implementation of the smart transporter dispatch system allowed 95.24% of patients to be transported to their destination within 15 minutes, and improved transport satisfaction.
2. Implementation of the device management system has achieved online management of 100% medical devices in the hospital. After vendors complete maintenance, the record or maintenance work order is automatically uploaded to the system, so that it can be accessed. This reduces paper consumption by 100,000 sheets/year and saves management personnel 1,800 hours/year.
3. Implementation of the smart parking lot management system reduced the time it takes vehicles to enter from 1.5 minutes to 5 seconds and the time it takes vehicles to exit from 2 minutes to 5 seconds.

4. Implementation of the central monitoring system - IAQ allows air quality in each area to be monitored in real-time on the system's panel, and eight-hour average CO2 concentration was lowered from 1,207 ppm to 954 ppm.
5. Smart server room monitoring and management:

- Handling internal attack incidents: Able to immediately respond
- Handling external service attack incidents: Actively blocks abnormal connections
- System resource monitoring: Reduced 98% of service interruptions
- Environmental monitoring: Real-time monitoring

About the Hospital

Taipei Medical University Hospital was established in 1976 and currently has nearly 800 beds and over 2,000 employees.

The hospital provides clinical services for 27 medical specialties, including internal medicine, surgery, gynecology, and pediatrics, and 47 medical sub-specialties, including neurology and neurosurgery, plastic surgery, gastroenterology and gastroenterological surgery, and cardiology and cardiovascular surgery.

The hospital strives to enhance its featured medical services and promote cross division and department collaboration and information integration. It established a Reproductive Medicine Center, Da Vinci Surgery Center, Cardiovascular Center, Breast Medical Center, Medical Imaging Center, Weight Management Center, Minimally Invasive Spine Surgery Center, Comprehensive Examination Center, International Medical Center, Aesthetic Medical Center, Hemophilia Center, and Kidney Disease and Transplant Medical Center, providing high quality medical services.

Keywords

Central monitoring system- IAQ, License plate recognition, Medical device management, Smart porter dispatch system, Smart server room monitoring and management

Contact Details

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Environmental Management

Far Eastern Memorial Hospital

Cloud Modularized Mechanical and Electrical Management Platform

Overview

Large hospitals have massive and complex electrical facilities, including power, air conditioning, water supply and drainage, gas, and elevator (escalator), and the management of different equipment systems is not an easy task. The hospital established a central control room to monitor and manage equipment operations, and completed electrical equipment traceability by developing an electrical engineering smart integrated platform along with a mobile app for electrical equipment (the "Engineering All-in-one App").

The electrical engineering smart integrated platform includes all of the hospital's basic databases for engineering equipment, maintenance plans, construction management, and repair management. The Engineering All-in-one App allows users to operate the system on their mobile device by scanning the QR code on equipment for maintenance, repair, and data access. Related functions include:

- Repair cost of devices in the past and maintenance cost of equipment.
- Linked to the repair system and allows a repair request to be made by directly scanning the asset number QR code or entering the app.
- For first level maintenance by each department and second level maintenance by dedicated units, the maintenance cycle can be set in the schedule to carry out maintenance work.
- The annual project budget management platform serves as reference when budgeting for the replacement of old equipment. The system's database is integrated into the Tableau system, and can be linked to the outpatient, emergency, and inpatient systems, surgery scheduling, and special examination databases for analysis, providing a basis for making device procurement and management decisions.

Benefit

1.Smart management

- First level maintenance by

departments: Employees in departments other than the Department of Engineering can perform first level maintenance on their computer or mobile device using the system, or execute safety inspections and first level maintenance of key equipment.

- Periodic maintenance scheduling for major equipment: Equipment inspection forms are simplified and integrated, which reduced the number of forms by 30%, and maintenance is divided into monthly/quarterly/annual maintenance based on their inspection frequency. The entire process is made smarter by using smartphones or tablet PCs.
- Maintenance abnormality reminder: When conducting maintenance inspections, light signals on record forms are used for warnings to quickly learn about the abnormal situation of equipment and give instructions to handle the situation.
- Equipment abnormality repair, transfer, and management functions: Directly select the repair system to enter repair procedures or use a handheld device to scan the QR code on equipment to request repair. If the department that requested repair selected the wrong maintenance department, the request can be transferred in the system.

2.Implementation results

- Improved the manpower required for current operations and errors when inputting data on paper documents.
- Supervisors can view repair requests and contents each day using the app, and achieve more timely repair, in which equipment repaired within three days increased to 92%-94%.

Desktop computer system execution screen

Mobile phone system execution screen

Execute maintenance inspection

About the Hospital

Far Eastern Memorial Hospital shoulders the responsibility of emergency and critical care. It currently has 64 divisions, 2 centers, and a total of 1,408 beds. It provides over 6,500 outpatient services and nearly 400 emergency medical services each day, the fourth highest in Taiwan, and bed occupancy rate is maintained at 85% and above. There are standard operating procedures for all operations, and the hospital implemented ISO9001 quality management system as early as 2004. The hospital sets quality goals each year and passed care quality certifications of five disease.

The hospital encourages research and established 3 common laboratories, 1 animal laboratory, and a 24-hour electronic library that provides electronic services. The hospital publishes approximately 150 journal papers each year, in which at least 120 are SCI papers.

Keywords

Electrical maintenance, Engineering maintenance platform, Engineering cloud, Engineering management system, Smart engineering app

Contact Details
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