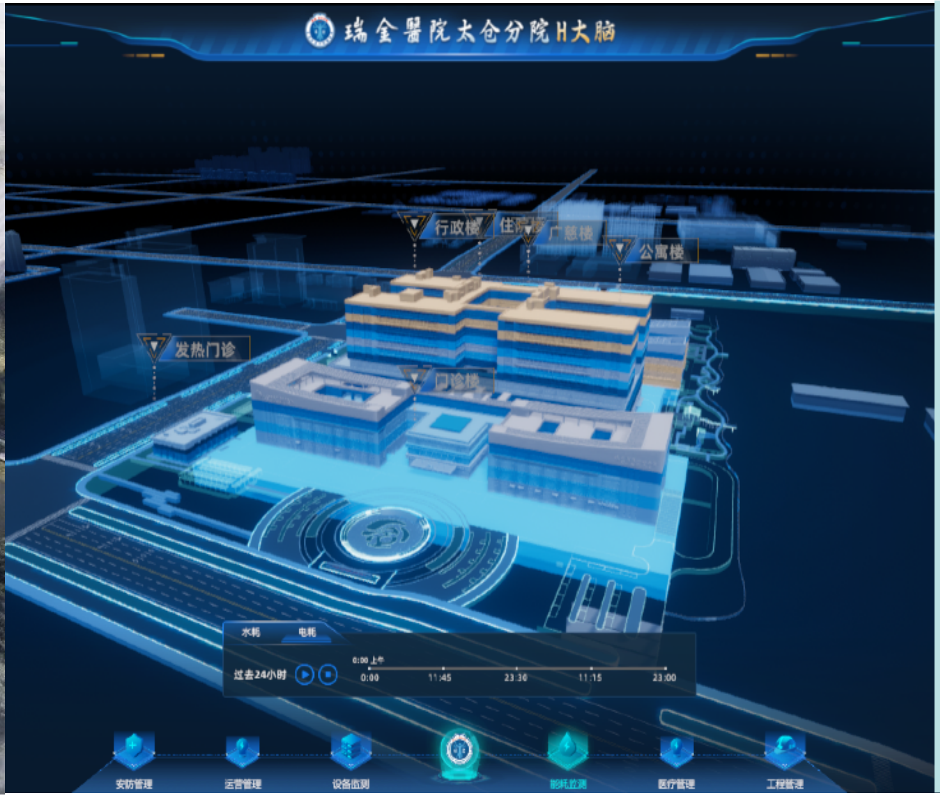
Introduction to the Digital Twin Platform Construction Scheme of Ruijin Hospital Taicang Branch

Project Overview and Positioning:

Ruijin Hospital Taicang Branch



Ruijin Hospital Taicang Branch (full name: Taicang Loujiang New City Hospital) is a major livelihood project in Jiangsu Province. Construction started in October 2021, and it is built in accordance with the standards of a tertiary first-class general hospital, with 1,000 beds planned. It is scheduled to be officially put into use in 2025. The hospital is located in the Linhu International Community of Loujiang New City, with a total construction area of about 270,000 square meters and 1,000 inpatient beds planned. The Taicang Branch is fully integrated into the integrated management system of Shanghai Ruijin Hospital, implementing "vertical management, integrated operation, and homogeneous medical care".

Project Positioning and Services:

- Regional Positioning: As the first research-oriented tertiary first-class hospital in Taicang, it focuses on serving residents in the local area and the Yangtze River Delta region.
- Functional Features: Covering the diagnosis and treatment of difficult and critical diseases, telemedicine collaboration, and clinical research transformation.
- Industrial Collaboration: Linking with the Taicang Biomedical Industrial Park to promote the industrialization of medical technology.

Demand Analysis

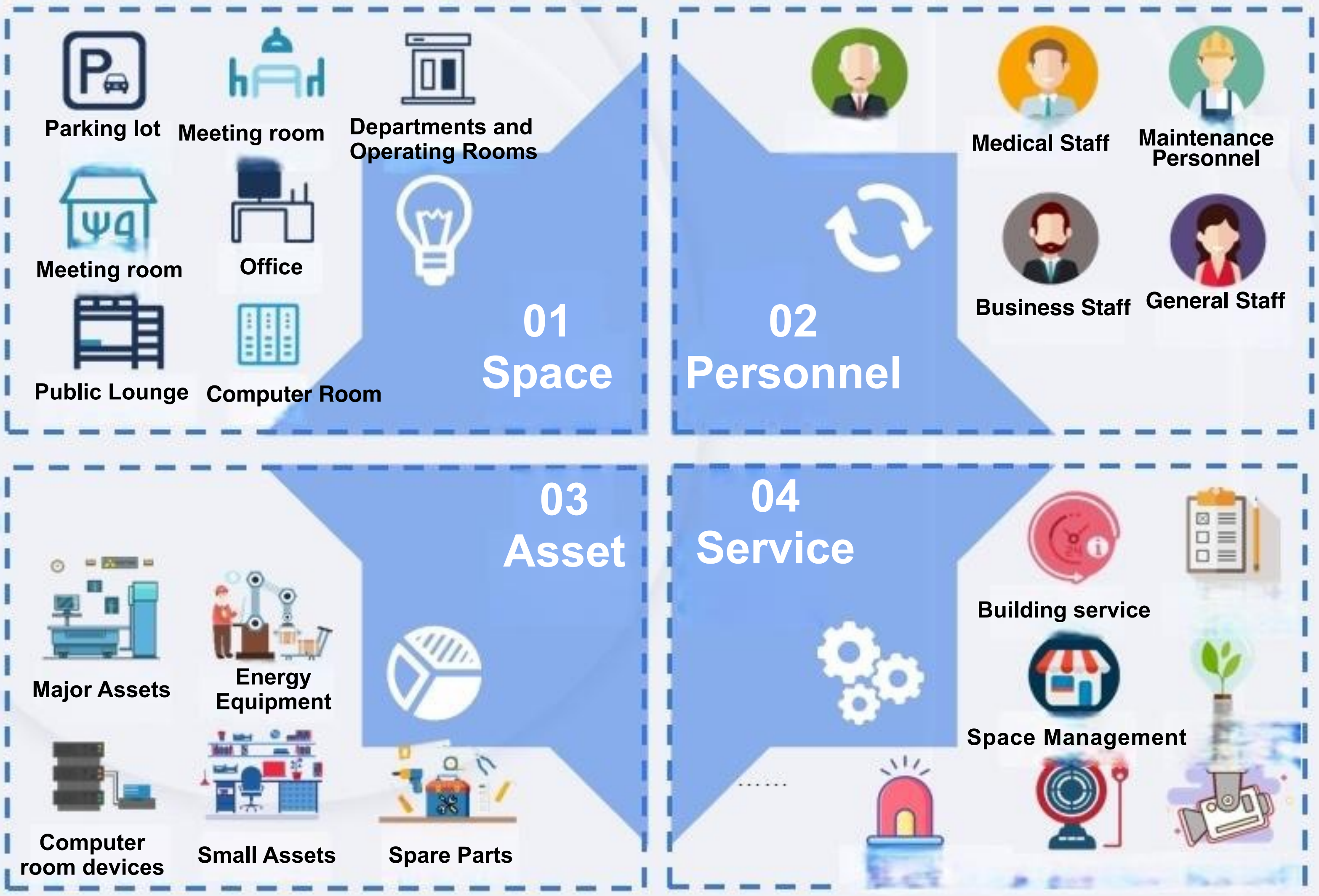
Main Management Issues: 1. Information silos lead to low operation and maintenance efficiency. There are information barriers between various systems, which are not interoperable in function and cannot share data. While single-functional services cannot fully meet the management needs of the hospital campus, information transmission between different departments (systems) consumes a lot of human and material resources, resulting in low operation and maintenance efficiency.

Spatial Resource Management and Utilization Requirements

- Classified management of different types of spaces
- Real-time grasp of space utilization
- Flexible adjustment to maximize utilization
- Covered spaces: Parking lot, conference room, various departments and operating rooms, cafeteria, office, public rest area, equipment room, etc.

Asset and Equipment Management and Utilization Requirements

- Achieve energy conservation and emission reduction
- Ensure normal and efficient operation of equipment
- Real-time grasp of equipment linkage status
- Extend equipment service life
- Improve asset and equipment safety
- Improve warehouse turnover rate
- Reduce asset loss
- Covered assets and equipment: Major assets, energy equipment, equipment room equipment, small assets, spare parts, etc.
- Service and Experience Improveme



Personnel Management Requirements

- Improve operational efficiency
- Reduce management difficulty
- Reduce management costs
- Improve office efficiency
- Strengthen safety assurance
- Provide humanized services
- Improve employee satisfaction
- Involved personnel: Managers, medical staff, maintenance personnel, business personnel, ordinary employees, etc.

Service and Experience Improvement Requirements

- Automated and intelligent processes
- Interconnection of data information
- Reduce manual intervention
- Improve service level
- Improve management efficiency
- Strengthen safety prevention
- Reduce operating costs
- Related businesses: Building service work order management, space management, energy consumption monitoring, emergency management, equipment monitoring, security monitoring, etc.

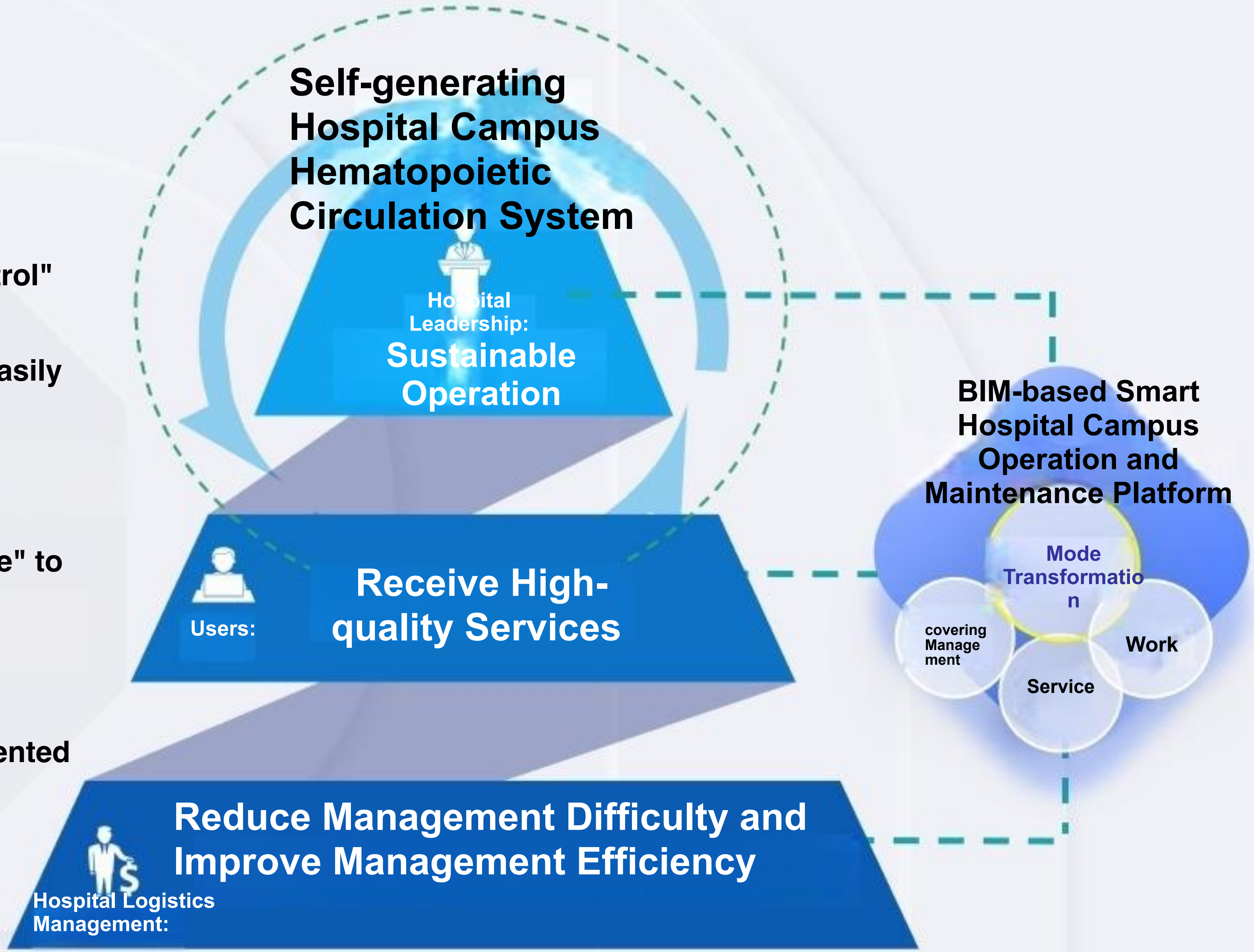
Construction Objectives

From "passive response" to "proactive control"

From "invisible resources" to "visible and easily accessible resources"

From "decision-making based on experience" to "application of data analysis"

From "management control" to "service-oriented with people"



Construction Highlight 1:

BIM Operation and Maintenance Features

Based on BIM technology, various intelligent systems in the building operation and maintenance process are integrated uniformly with the BIM model as the carrier, realizing the interconnection among people, equipment, and buildings, and providing a comprehensive control platform for building operation and maintenance, thereby better exerting the functions and roles of the building.

- **Whole Life Cycle Management:** It includes building operation data information, building space and location information, equipment attribute information, operation and maintenance information, and associated information of different professional systems, etc., to realize the whole life cycle operation and maintenance management of building operation and maintenance.
- **New Property and Operation and Maintenance Management Mode:** Based on the data information carried by the BIM building model, through information means and Internet thinking mode, it assists property management personnel to better realize the operation and maintenance management service of equipment and facilities, and ensure the normal operation of the building interior.
- **3D Visual Monitoring:** It enriches the traditional purely digital monitoring method, converts the planar display form into a three-dimensional spatial display method. Based on 3D space, what you see is what you get, realizing a new management concept and management mode.
- **Multi-System Collaborative Linkage:** With the advantage of 3D space management of the building BIM model, and taking the BIM model as the carrier for data and system integration, horizontal data association and information linkage between various systems can be realized in the same space, coordinating multiple systems to make linkage responses, and providing managers with multi-faceted monitoring and management means.
- **Continuous Monitoring and Effective Management of Facilities and Equipment:** The BIM model provides a basis for the whole life cycle management of the building. Based on every object inside the building, various corresponding data can be associated with the model and stored permanently in the BIM operation and maintenance platform.

Construction Highlight 2:

Traditional management relies on "human-based defense", ensuring the safety of areas and equipment through inspections and patrols, which leads to low efficiency in problem-solving. We will transform from the traditional "human managing human-based defense" to "machine managing machine-based defense", and build a "Digital Campus Smart Operation and Maintenance Platform" supported by BIM + AI + IoT. It integrates various electromechanical equipment and monitoring systems with different functions in a unified manner, enabling buildings to proactively respond in advance based on prediction and self-learning functions instead of passively handling through alarms. This is a new mode of operation and maintenance management. Its purpose is to reduce on-site fixed maintenance personnel on the one hand, and to realize optimized management of equipment operation with the help of building control and lighting systems on the other hand.

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Virtual Inspection + Regular Maintenance Reminder

AI Dispatching

AI Operation and Maintenance (Machine-based Defense)

Descriptive Data Analysis + Predictive Data Analysis + Diagnostic Data Analysis + Interactive Behavior Data Analysis

Artificial Intelligence Algorithm + Building Operation and Maintenance Model Simulation

→ **Improve energy utilization efficiency**

→ **Improve operation and maintenance management efficiency**

→ **Reduce operating cost expenditures**

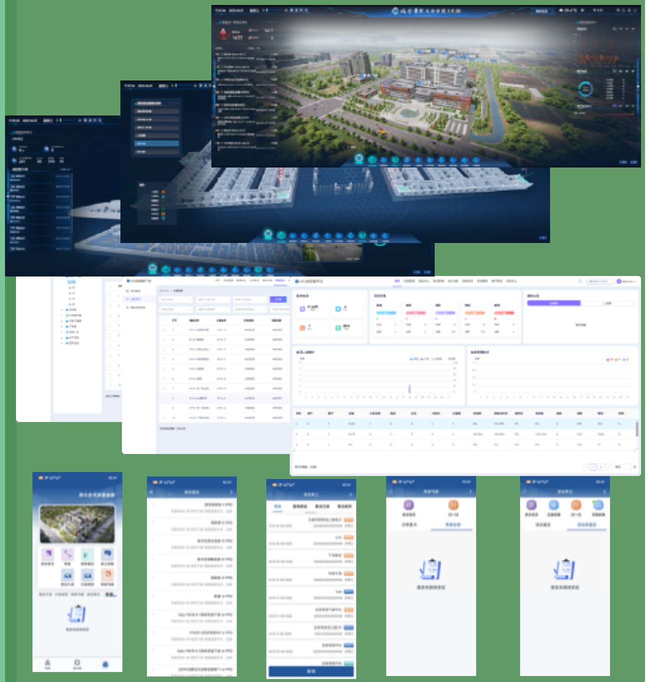
Main Construction Content:

Platform Capability

By integrating BIM (Digital Twin Technology), AI (Artificial Intelligence Technology), Internet of Things and other technologies, various information systems, security monitoring systems, management resources, and medical systems of Ruijin Hospital are organically integrated and connected to build a comprehensive management platform for Ruijin Hospital. It breaks down information barriers in the hospital campus, realizes interconnection, resource sharing and collaborative work, and forms a networked and intelligent hospital campus management ecosystem.

Construction Content

- Ruijin Hospital Intelligent Digital Twin Platform
- Internet of Things Middle Platform
- Data Middle Platform
- Logistics Operation and Maintenance Management Platform (Web)
- Logistics Operation and Maintenance Management System (APP)



Application Scenarios

- Security Management: Video surveillance, alarm center, access management, intrusion alarm, electronic patrol, fire protection system, fire drill, parking management, access control management
- Operation Management: Conference system, information release, public broadcasting, smart library
- Equipment Monitoring: Heating, ventilation and air conditioning, water supply and drainage, power supply and distribution, chiller group control, lighting, elevators, environmental monitoring
- Energy Consumption Monitoring
- Medical Management: Intelligent infusion, medical waste management, smart ward, track logistics, intelligent warehousing, smart operation, bedside call system, operating room, VIP ward, medical gas monitoring
- Engineering Management: Equipment ledger, inspection and repair reporting, maintenance, equipment inspection

Value and Role

✓ Standardized and normalized management processes;

✓ IoT data linkage and analysis to reduce operating costs;

✓ Smart alarm, abnormal perception, multi-terminal linkage, and rapid alarm;

✓ Closed-loop business scenarios, synergizing various subsystems, and deeply exploring scenario value-added services;

✓ Assisting managers in decision-making and quickly grasping the overall situation;

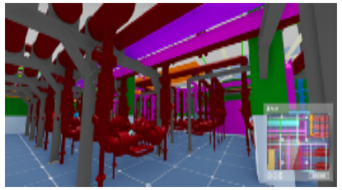
✓ Data interconnection, breaking information silos, and improving user experience

Visual Application:

Building Visualization

Intelligent System Visualization

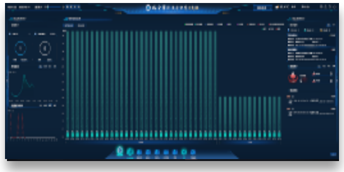
Establish a one-to-one mapping relationship between real equipment and BIM models. Associate the object models in the Internet of Things and the equipment in the property management system with the BIM model. Take the BIM model as the twin body of the real world to carry and feed back real-time operation data.


Chiller Group Control System Visualization


Lighting System Visualization


Power Supply and Distribution System Visualization


HVAC System Visualization


Elevator System Visualization


Water Supply and Drainage System Visualization


Visual Roaming

Building Visualization

Medical Visualization

Facility Visualization

Security Visualization

System Architecture:

Interaction Layer

Large Screen

PC

Mobile Terminal

Application Layer

- Public Service Management
- Operation and Maintenance
- Operation Management
- Energy Management

Platform Layer

- H-Brain of Ruijin Hospital Taicang Branch (Unified Management on One Screen, Overall Situation, Command and Dispatch, Cross-System Linkage, Event-Driven Business Closed Loop)
- Business Process Engine (Design, Execution, Monitoring and Optimization of Business Processes, Process Node Management, Flow Management, Process Example Management)
- Internet of Things Platform (Intelligentization, Electromechanical, Application Integration)
- Data Middle Platform (Data Integration, Governance, Analysis, Service)
- ICT Infrastructure: Computing, Storage, Network, Security

Wireless Private Network (5G/Lora/eLTE-IOT)

Wired Private Network (Optical Cable/Twisted Pair)

Perception Layer

Internet of Things (IoT) Edge Gateway

Building System	Security System	Access Control System	Lighting System	Information Release	Medical System	Operating Room Management
Fire Protection System	Parking System	Environmental Monitoring	Energy Consumption Monitoring	Public Broadcasting	HIS System	Warehouse Management

Comparison with Conventional System Integration Platforms:

Conventional System Integration Platforms

XX Hospital Intelligent Management System, IBMS Intelligent Management System

VS

Ruijin Hospital Taicang Branch H-Brain

System Digital Monitoring and Management Display

① Traditional purely planar display

② Traditional purely planar display of system topology diagrams

③ Equipment management is simple form-based management

④ Data cannot be linked between various subsystems

1. Three-dimensional spatial display method, based on 3D space, what you see is what you get, realizing a new management concept and mode
2. Various facilities and equipment that operate and are operated independently in traditional buildings are integrated into a unified BIM 3D visualized graphics-based intelligent building property and facility management platform for the building through IoT edge gateways. This realizes unified facility management and equipment monitoring. The spatial positioning and location information of building facilities, electromechanical, fire protection, security, cameras, access control, medical and other monitoring system equipment and monitoring points in the building are collected, analyzed, applied, and presented through BIM 3D visualized graphics

Platform Construction and Management Concept

① Based on computer networks and with software as the core, through information exchange and sharing, integrate various independent weak electronic systems with complete functions in the building into an organic whole, realize information sharing of systems, reduce system operation costs, improve the automation level of system maintenance and management, and provide personalized services

① Based on BIM technology, various intelligent systems in the building operation and maintenance process are integrated uniformly with the BIM model as the carrier, realizing the interconnection among people, equipment, and buildings, and providing a comprehensive control platform for building operation and maintenance, thereby better exerting the functions and roles of the building.

② Based on the data information carried by the BIM building model, through information means and Internet thinking mode, it assists logistics departments to better realize logistics services and the operation and maintenance management services of equipment and facilities, ensure the normal operation of the building interior, and realize a new property and operation and maintenance management mode

Digital Intelligent Cockpit:

Quickly reach every corner of the hospital campus and accurately perceive every pulse of the hospital campus

Visible

BIM-based IoT perception

Hospital campus situation, event situation

Equipment dynamics, personnel flow dynamics

Operation situation, medical situation

Manageable

Management and control of people, events, and objects in the hospital campus

Security operations, monitoring operations

Inspection operations, patrol operations

Repair operations, work order operations

Controllable

Trend prediction, risk controllability

Comprehensive management, emergency plans

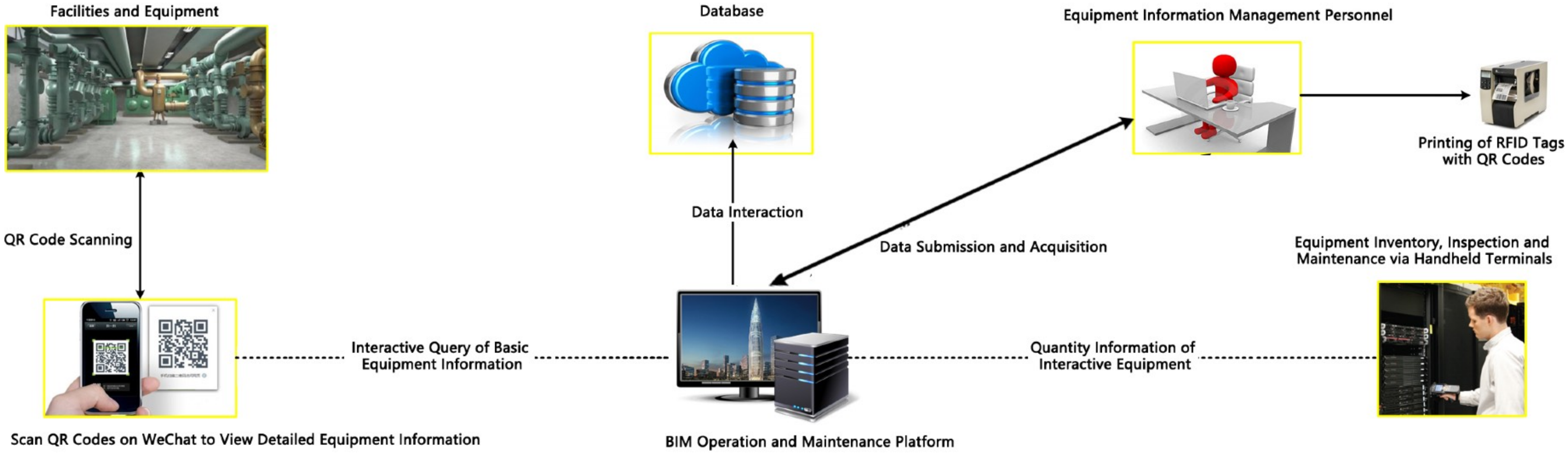
Security operation, operation and maintenance services

Asset operation, energy consumption operation

Operation and Maintenance Management - Facilities and Equipment:

◆ Equipment Account System Covering the Whole Life Cycle of Equipment

- ➢ Realize the comprehensive management and query of basic equipment information, such as various basic attribute information, spatial location information, and drawing documents, and realize the unified management of the BIM operation and maintenance platform and cloud business.
- ➢ Select the corresponding equipment, and quickly obtain the whole life cycle record of the equipment, including basic information, procurement information, commissioning information, maintenance information, information, and repair information, so as to facilitate operation and maintenance managers to accurately locate and view.
- ➢ Facilitate on-site application in the campus. The management mode integrated with mobile terminals can quickly realize work order query and processing, and on-site records of QR code-based inspection and maintenance.



Twin Unit: What You See Is What You Get

Refined Modeling of Units to Achieve Visual Spatial Management of Units and Improve Management Efficiency

Operating Room

- Usage Status
- Surgery Duration

Department

- Usage Status
- Reservation Status

Equipment Room

- Online Inspection Mode
- Unmanned Equipment Room Management

Office Area

- Allocation and Usage
- Refined Management

Consulting Room

- Reservation Status
- Usage Status

Conference Room

- Reservation Status
- Usage Status

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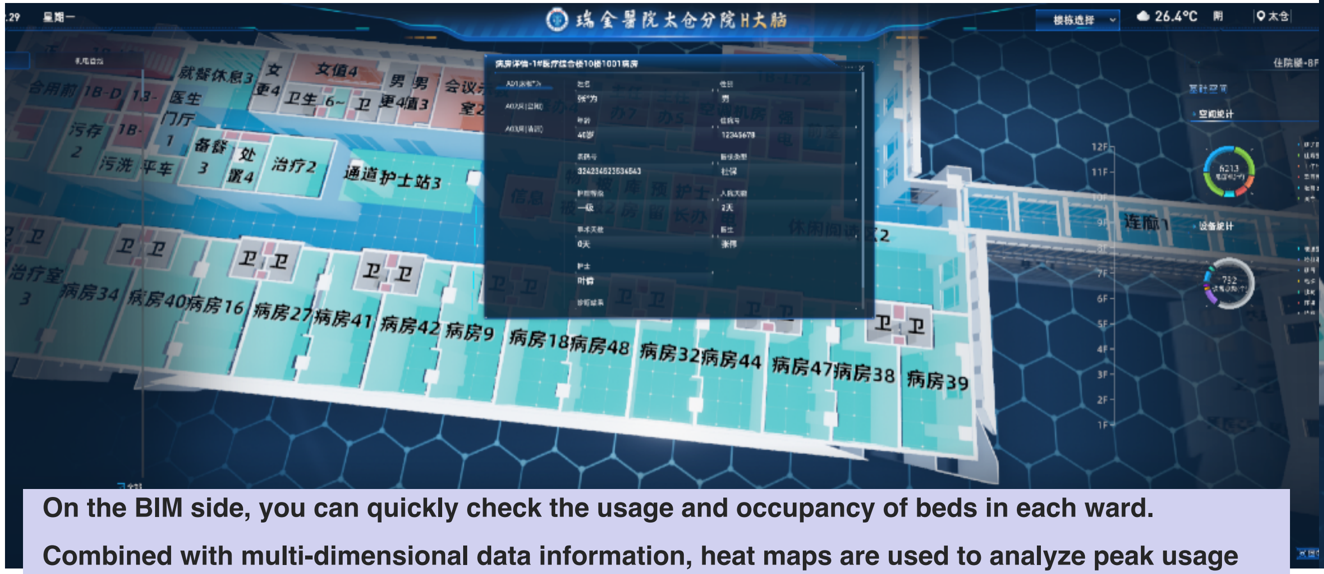
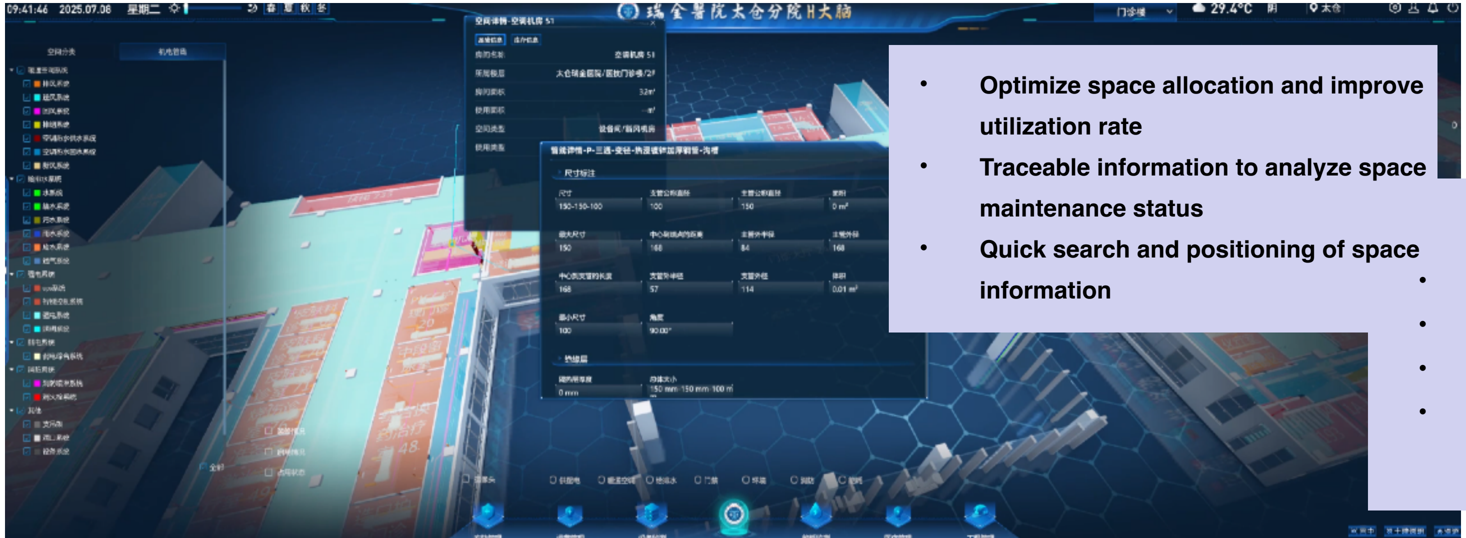
Twin Space Management:

Spatial Ward Management



On the BIM side, you can quickly check the usage and occupancy of beds in each ward. Combined with multi-dimensional data information, heat maps are used to analyze peak usage periods, utilization rates, etc.

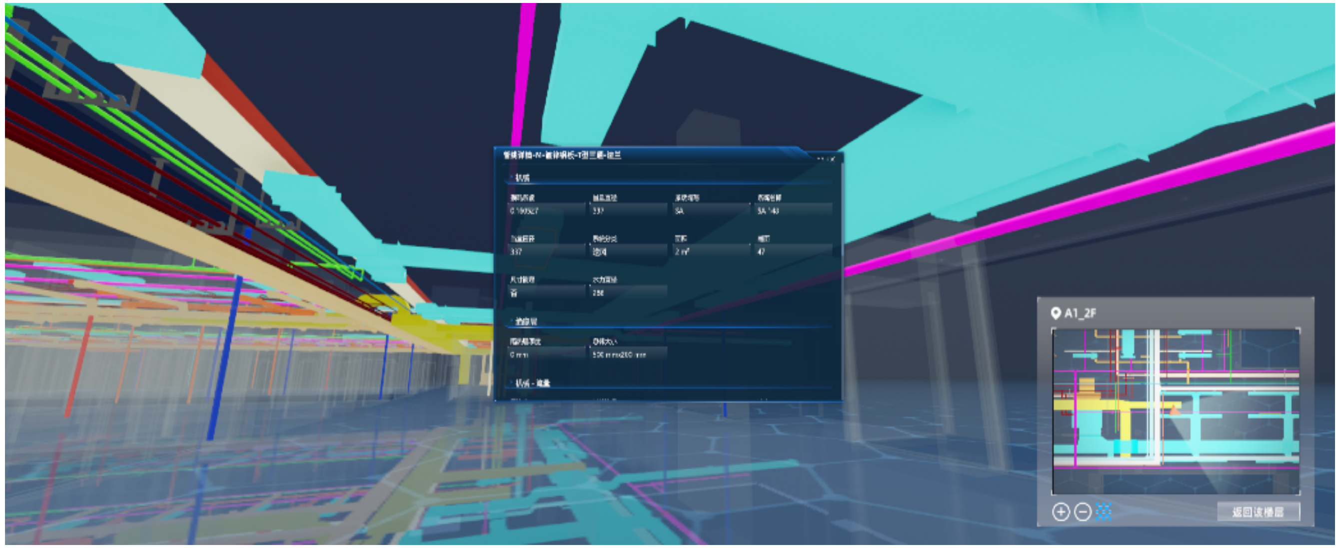
Spatial Analysis Indicators



- Optimize space allocation and improve utilization rate
- Traceable information to analyze space maintenance status
- Quick search and positioning of space information

- Space vacancy rate
- Space equipment management
- Space department management
- Space personnel management

Equipment and Pipeline Viewing:

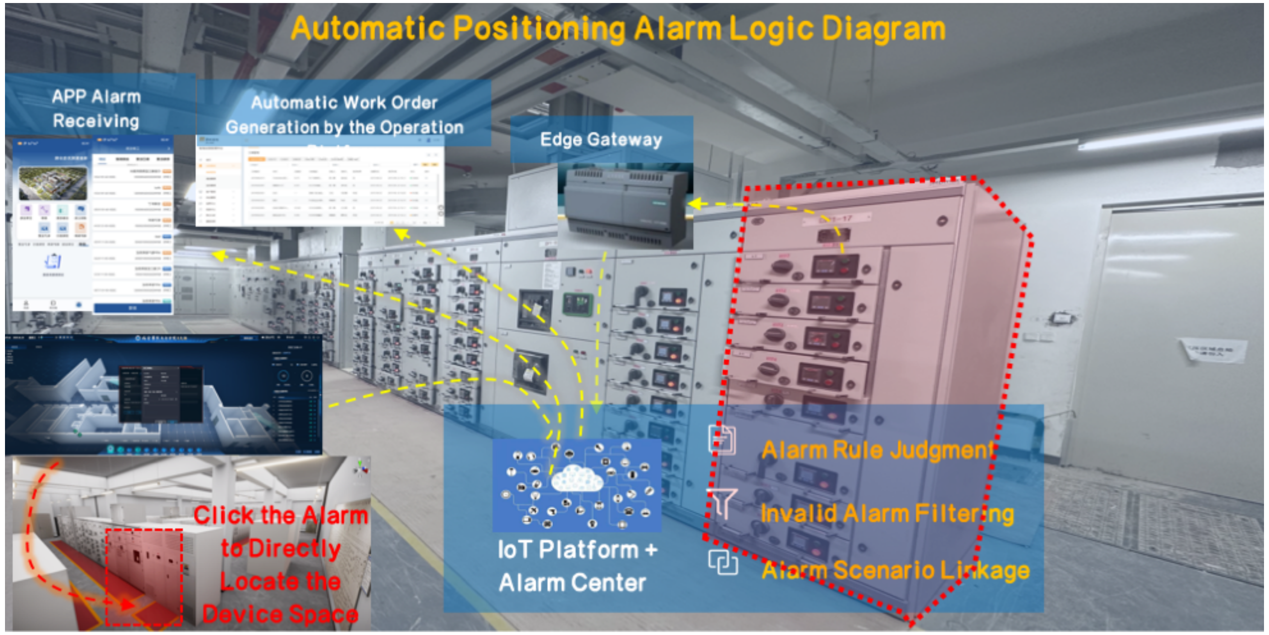


Concealed Faults, More Time-saving Maintenance

Through the BIM system, equipment or concealed equipment/pipelines inside ceilings and walls can be viewed in real time, greatly avoiding time waste caused by searching for fault points.
By clicking on equipment in the digital twin space, you can view basic information related to the equipment, real-time monitoring data of IoT devices, and equipment business data, achieving dynamic and static dual data management of equipment.

Automatic Alarm Location Logic Diagram

The process involves APP alarm reception, automatic work order generation by the operation platform, edge gateway, IoT platform + alarm center (including alarm rule judgment, invalid alarm filtering, and alarm scenario linkage), and direct equipment/space location by clicking the alarm. This realizes efficient and accurate fault alarm and location, improving the responsiveness and processing efficiency of equipment maintenance.



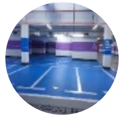
Equipment Monitoring and Alarm Center:

3D visualization, centralized integrated alarm information management, and real-time push of alarm reminders (avoiding separate alarms from each subsystem in the hospital campus, high labor costs, and low alarm reception efficiency).

Video security monitoring system

fire alarm system

intrusion alarm system



parking lot management system

access control management system

more systems…

System equipment linkage

Data Interaction with Ruijin Hospital Taicang Branch H-Brain

Real-time collection and monitoring of equipment data, including fault alarms, operating status, and operating parameters

System equipment linkage

Alarm Device BIM Model Auto-positioning

BIM 3D Visualization Model for Spatial Position Confirmation and Visual Alarm Management

Real-time collection and monitoring of equipment data, including fault alarms, operating status, and operating parameters

PC notification messagesSMS notification messagesAPP notification messages

CS/BS End

- Alarm Correlation Check
- Alarm Information Recheck
- Alarm Event Handling

Property Management Mini Program End

- Alarm Work Order Assignment
- Alarm Work Order Execution
- Alarm Work Order Review

Value:

Improve efficiency: Real-time push reminders of alarm information from hospital subsystems, and precise positioning to spatial alarm equipment based on the BIM 3D visualization model, improving the efficiency of alarm handling.

Enhance quality: 3D visualized BIM model management operations, enhancing the hospital's technological management experience and improving the quality of corporate image, etc.

Reduce costs: The smart hospital management platform uniformly monitors and controls all connected subsystems in the campus, reducing the labor time cost of the campus property safety management department for scattered monitoring operations of each subsystem.

Operation and Maintenance Management - Comprehensive Security:

Video Wall - Acts as a Monitoring Room

Video Grouping

Video Wall Customizatio n

Video Rotation

Video Spatial Association - From Finding Cameras to Linking Cameras

Intrusion Alarm and Video

Fire Protection and Video

Access Control and Video

Device Location and Video

Alarm + Positioning + Video Viewing

Remote Barrier Lifting + Video Confirmation

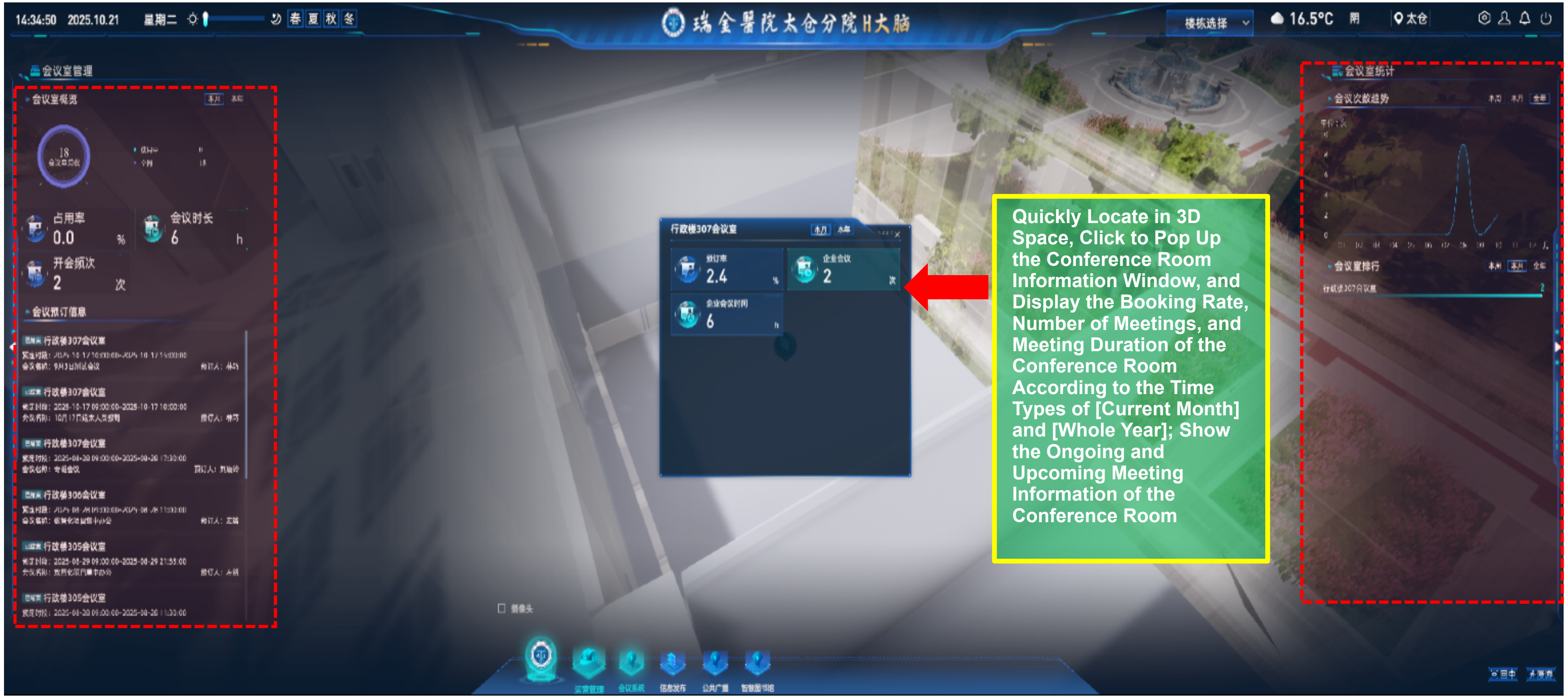
Video Inside and Outside the Elevator

Access Control + Video Confirmation

Video Patrol - Conduct Remote Video Patrol Like Browsing Douyin

Operation and Maintenance Management - Conference System:

•Conference Room Overview: You can view the usage of conference rooms in various areas of the hospital campus in real time, including statistical data such as occupancy rate, meeting frequency, and meeting duration. You can switch the view by dimensions such as this month and the whole year.
•Meeting Reservation Information: You can view the detailed information of meeting reservations in real time, including statistical data such as building, conference room name, status, reservation person, reservation time period, reservation time, and meeting name usage.



•Meeting Frequency Trend: Count the number of meetings by this week, this month, and the whole year. For this week/month, statistics are made on a daily basis; for the whole year, statistics are made on a monthly basis, forming a trend curve.
•Conference Room Ranking: Count the number of meetings for each conference room by this week, this month, and the whole year, and rank them according to the number of meetings.

Operation and Maintenance Management - Public Address System:

•Public Address Statistics: You can view the status of broadcasting equipment in various areas of the hospital campus in real time, including statistical data such as the total number of equipment, online count, offline count, and fault status.
•Equipment Status Statistics: You can view the online, offline, and fault lists of broadcasting equipment in real time. Click [Locate] to quickly navigate to the corresponding space and view the detailed panel.

•Meeting & Broadcasting Equipment Usage: Count the usage and current status of equipment by the floor where the equipment is located. The current status includes the equipment's playback status, volume level, mute status, offline status, fault status, etc.

Operation and Maintenance Management - Information Release System:

•Hospital Campus Information Release Statistics: You can view the status of equipment in various areas of the hospital campus in real time, including data such as the total number of equipment, online count, offline count, and fault status.
•Equipment Status Statistics: You can view the online, offline, and fault lists of equipment in real time. Click [Locate] to quickly navigate to the corresponding space and check the detailed panel.

Prison Safety and Fire Protection: Linked Control of Key Facilities

Lighting Visual Management and Control:

Based on the BIM model, the visual management of the lighting system is realized, achieving real-time monitoring and visual presentation of the lighting environment. Through the IoT control of lighting fixtures (on/off, brightness adjustment, color temperature adjustment, etc.), and the real-time monitoring and statistics of the operating status, operating parameters, and cumulative operating energy consumption of lighting distribution boxes and power distribution circuits, on-demand remote scenario-based configuration and control (PC terminal, APP terminal) are realized to achieve real-time monitoring, efficient management and energy-saving optimization.

Value Presentation

- Linkage of lighting and energy-saving strategies (peak-shifting, vehicle-coming mode, etc.), optimize circuits, eliminate invalid lighting, and reduce operating costs
- Lighting self-inspection, self-inspection is activated when the lighting plan is turned off, improving lighting quality and enhancing lighting experience
- Fully automatic lighting operation, automatic location and alarm of equipment failures, reducing the incidence of safety accidents of lighting equipment

Smart Parking

Traffic Flow Analysis

System Linkage

Vehicle Guidance

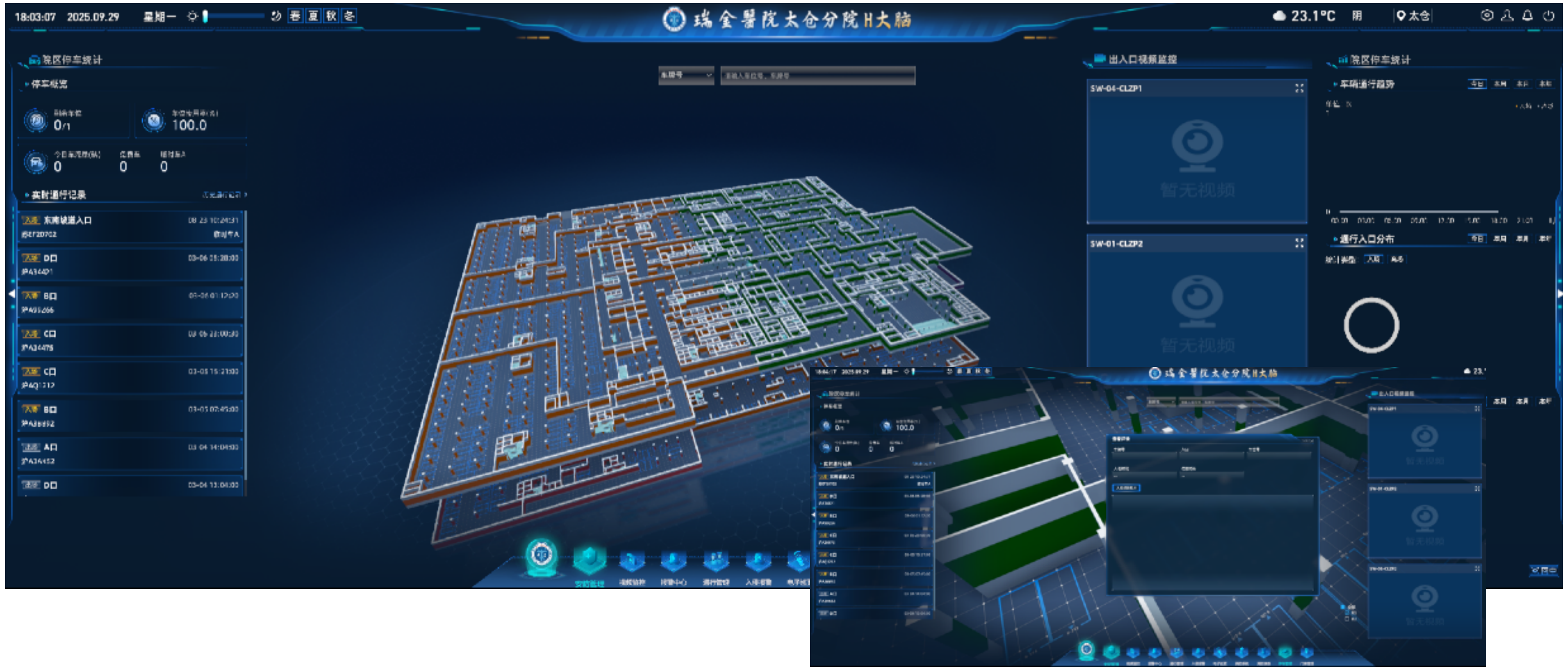
Vehicle Navigation

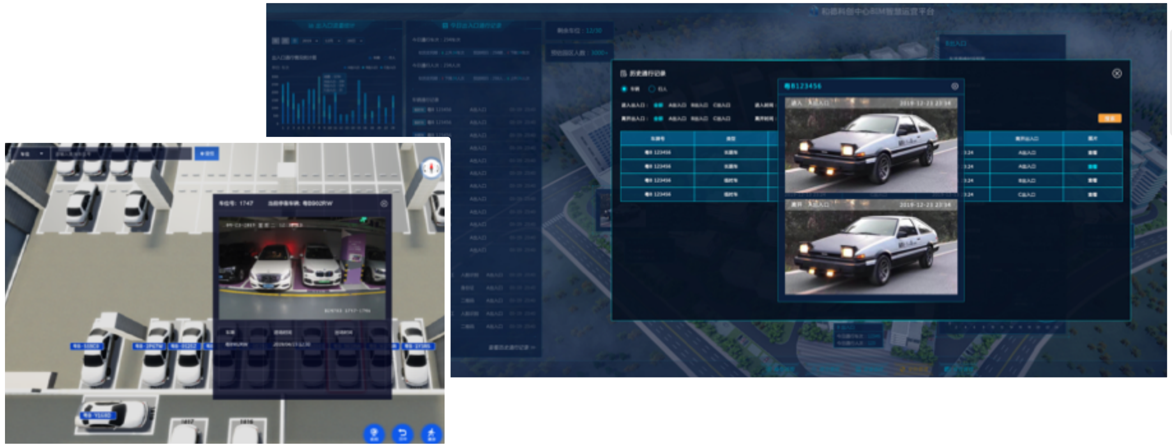
Parking Space Management

Reverse Car Finding

Vehicle Positioning

Seamless Passage





View the overall situation of the entire parking lot globally

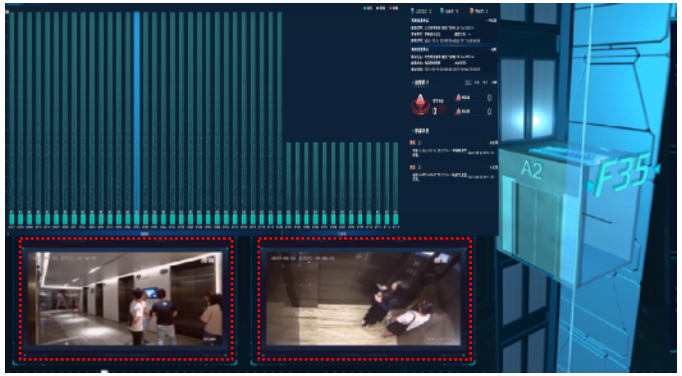
1. Guide traffic and pedestrian flow through visualization to solve the problem of quickly finding parking spaces when parking spaces are highly mobile, and improve parking efficiency.
2. Establish an automated, unmanned and intelligent parking lot management system to reduce traditional human management costs.
3. Control the overall situation of the parking lot globally and timely direct and dredge parking lot entry/exit congestion emergencies.

Click to view vehicle information (vehicle attributes, entry time, etc.)

Safety and Fire Control in Detention Centers: Linked Control of Key Facilities

Elevator Safety in Detention Centers

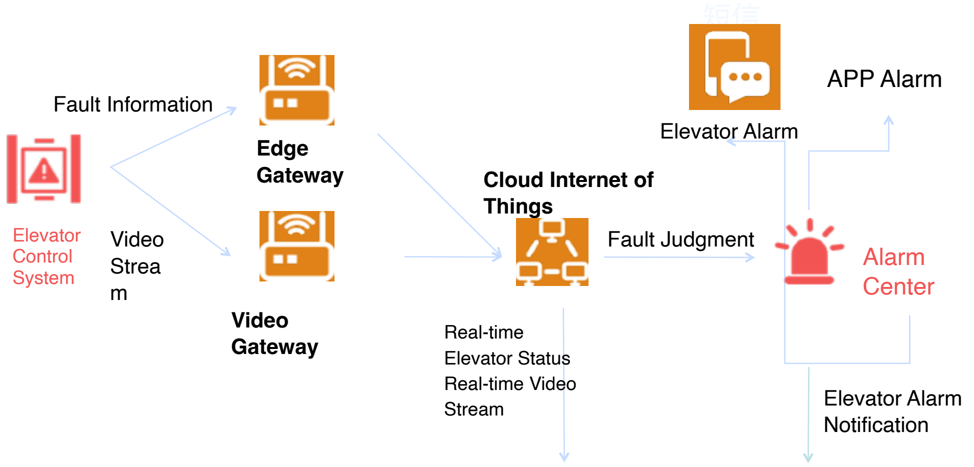
BIM Model and Elevator System Linkage



View the spatial position of the elevator system in the 3D digital twin space and display the operation status of the elevator system

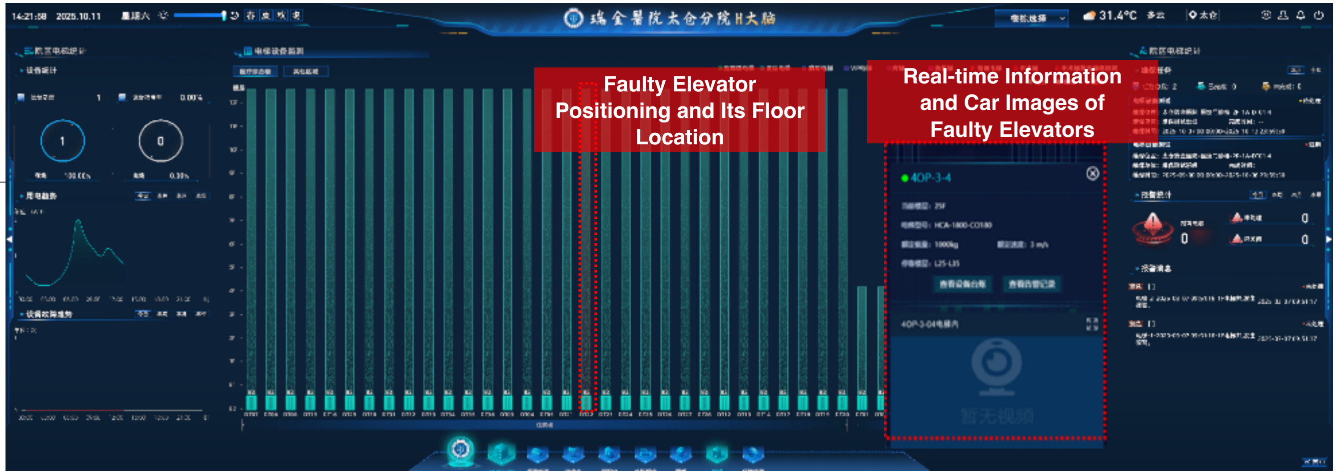
Real-time Monitoring via Mobile App

报警流程



Elevator Alarm Triggers Work Order Process

- ➢ Generate alarm information immediately, pop up forcibly and generate a work order, and send it to the corresponding person in charge and BIM system administrator to check the location and floor of the faulty elevator
- ➢ Link with the camera in the elevator on BIM to check if there is anyone, so as to judge the alarm level
- ➢ Maintenance personnel and elevator maintenance manufacturers carry out elevator maintenance
- ➢ Complete the alarm work order process and display the overall process in BIM



Campus Personnel Safety Control: Heat Map of Patients

- Through the heat map, campus administrators can real-time monitor the distribution of patients in various consulting rooms of the campus, including information such as the number and density of personnel in each area.
- The heat map can display personnel flow trends over different time periods, helping administrators understand the daily activity rules and abnormal flow of patients in the campus.
- Combining historical and real-time data, the heat map enables administrators to assess the safety risks of various areas in the hospital, providing a basis for formulating effective safety prevention measures.
- In emergency situations, the heat map can quickly locate crowded areas, providing strong support for emergency evacuation and rescue work.

Smart Fire Protection: Safeguarding the Safety Bottom Line

Early Warning

Fire Equipment Monitoring

- Support 724 hours all-weather monitoring of fire equipment and situation, timely early warning, and enhance fire supervision;

Pain Points Solved

- ➢ Solve the problem that the campus is large in scale, has many buildings, fire management involves a wide range, and traditional supervision methods are difficult to supervise effectively;
- ➢ Solve the problems of various types of fire hazards and weak intelligent management;

Confirmation

Fire Visualization

- Support visual presentation of fire resources, fire floors, and evacuation exits, and view on-site video situations to improve the scientificity and timeliness of fire decision-making

Construction Value

- Perceive risks and respond in seconds
- Reduce the frequency of fires and accelerate the handling efficiency of fire accidents

Disposal Response

Fire Work Order Processing

- Support multi-terminal access to alarm information and form a closed-loop disposal

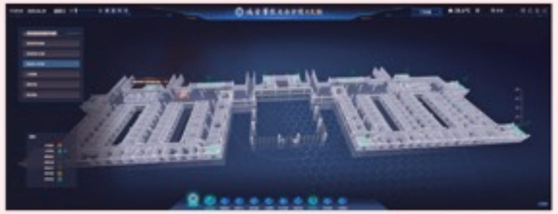
User Entity

Mainly used by the security department.

Emergency Response Plan

Automatically select the emergency response plan and display the relevant specific steps

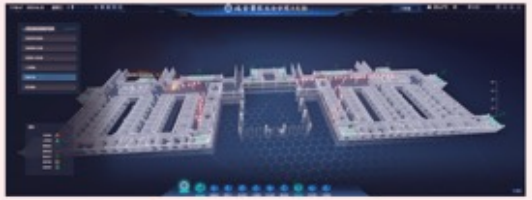
In the BIM system, fire situations and personnel positions can be simulated. After intelligent path planning, it provides emergency response plans for fire drills and emergency drills.



Simulated Fire Location

Simulated Personnel Location

Evacuation Route



Attack Route

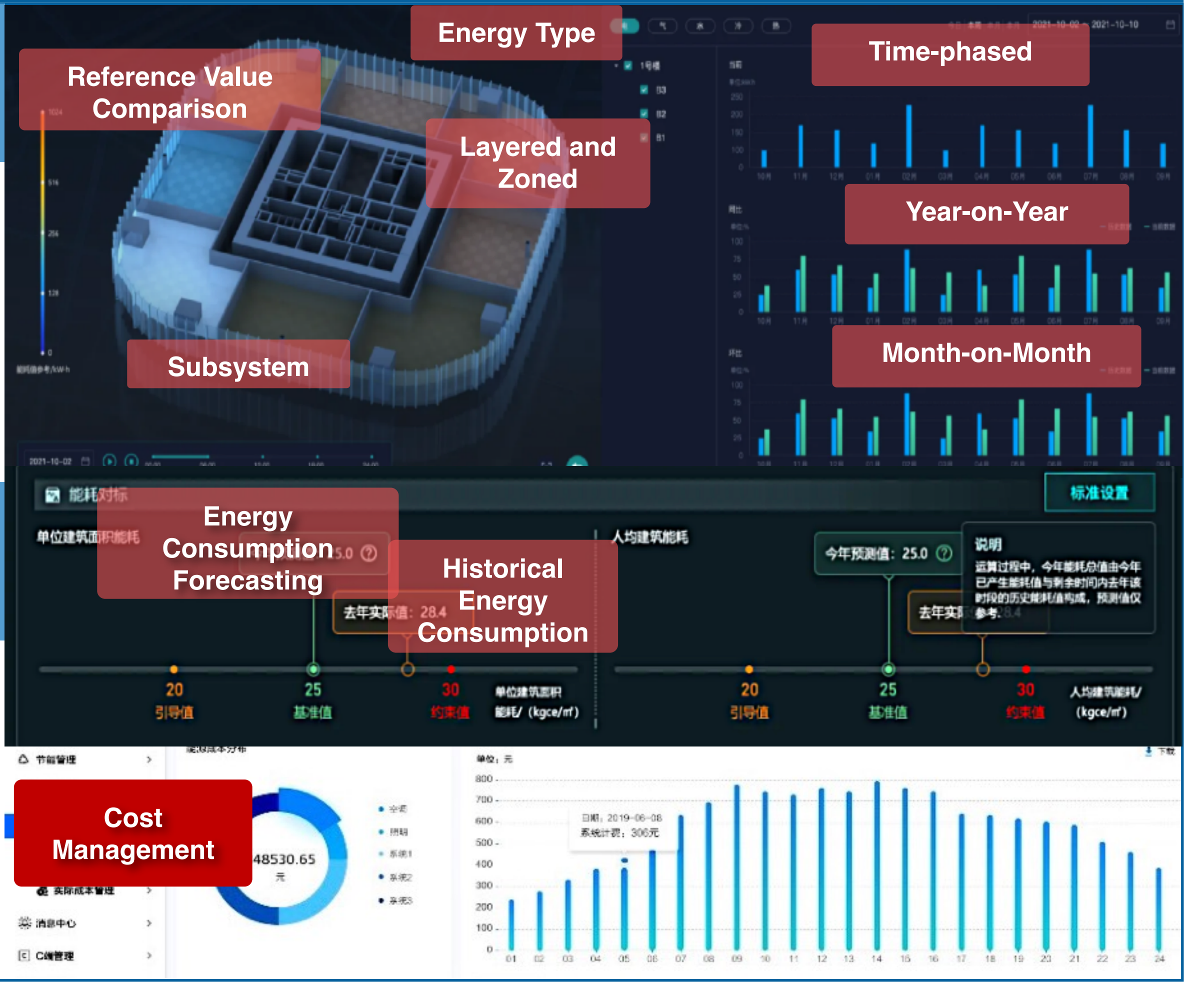
Energy Consumption Management

Energy Plan

Energy Statistical Analysis and Planning

Comprehensive and Multi-dimensional Energy Statistical Analysis

1. It can integrate the energy metering and statistical subsystem to provide a unified view of energy consumption of different types and dimensions (electricity, gas, water, cooling, heating) in different layers/zones, time periods, and year-on-year/quarter-on-quarter comparisons with historical data.
2. Engineers can also view energy flow diagrams and energy consumption system diagrams on the platform to clearly grasp the relationship network of metering equipment and energy consumption.



Scientific Energy Plan Prediction and Cost Management

1. Based on historical energy consumption, formulate reasonable energy performance indicators, predict future energy usage, provide timely feedback, issue excess warnings, and generate reports automatically.
2. Support gradient billing for various energy media, monitor energy costs, predict cost expenditures, and provide timely feedback.

Operation Management - Material Management

Assets are characterized by large quantity, various types, high value, and long service life, resulting in great management difficulty.
Addressing the challenges of traditional paper records, unclear asset status, unknown quantity, difficult implementation of responsibility system, no records of business operations, difficult traceability, and difficult assessment.

Standard Data Coding System
Express the uniqueness of facilities and equipment
Have unlimited expandability
Convenient and concise identification
Flexible data association
Convenient implementation and operation

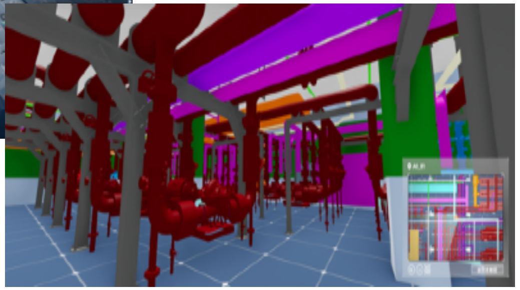
Fast Closed-loop for Abnormal Alarms

When system equipment or environmental parameters are abnormal, the system can proactively locate the abnormal position and type, and notify the relevant person in charge immediately.

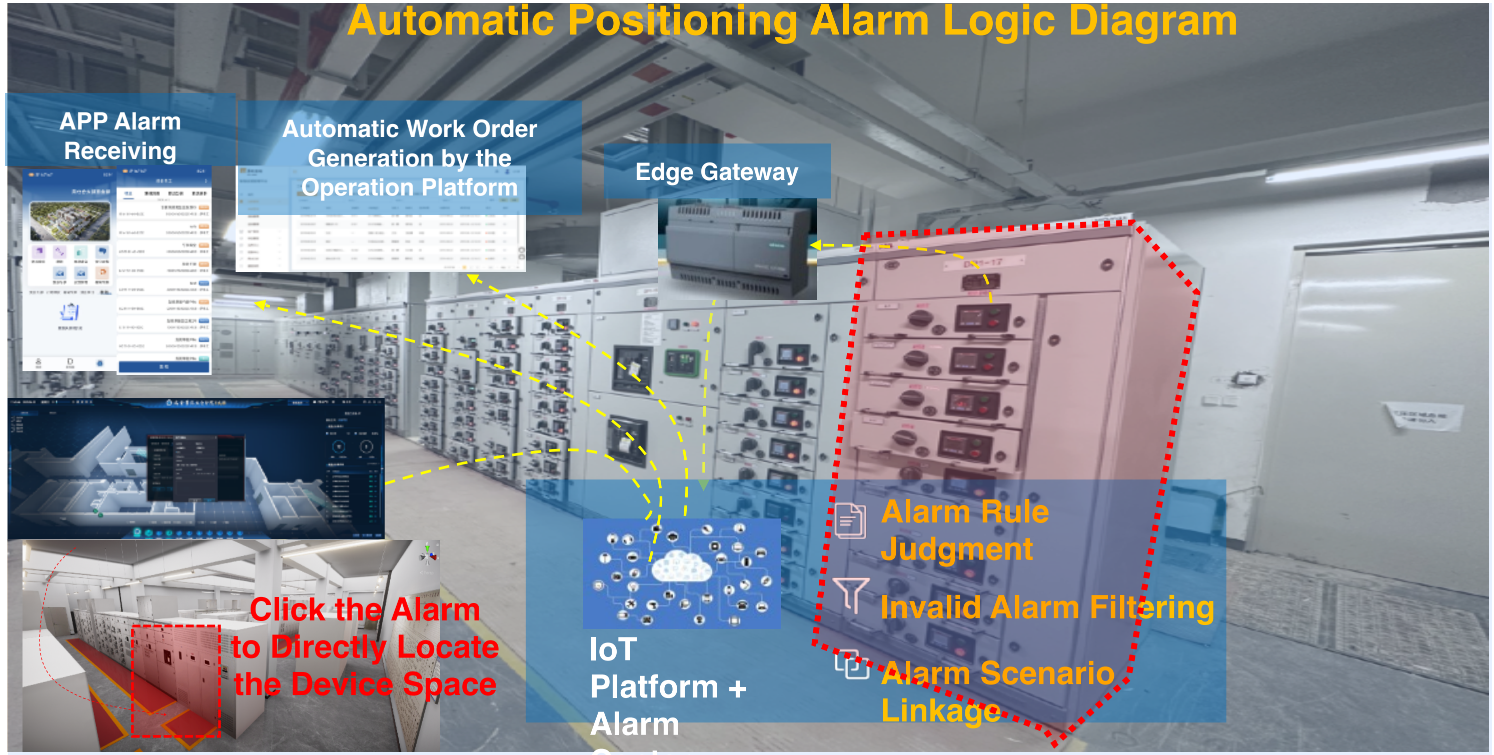
Monitoring of Water Supply and Drainage System

Monitoring of Power Supply and Distribution System

Monitoring of Air Conditioning System



Monitoring of Chiller Group Control Equipment



Value Presentation

- Visual query of equipment information, reducing the difficulty of personnel operation.
- Refined query of pipeline routing, improving the efficiency of fault detection.
- Automatic positioning and alarm for equipment faults, reducing the incidence of equipment safety accidents.

Medical Specialties

Track Logistics

Access the track logistics system to view the driving trajectory of loaded trolleys in real time.

Intelligent Warehousing

1. Access the warehouse management system to view real-time inventory information of the warehouse. The drug inbound and outbound statistics platform can be updated in real time.
2. Expiration reminder for warehouse drugs, which can quickly locate the 3D module to view drug production information, etc.

Intelligent Operation

Supports viewing the medical guidance and triage system, nurse station intelligent information system, medical staff intercom system, etc.

Smart Ward

Based on the 3D model space, you can view the spatial distribution of all wards. Click on a ward to view patients' basic information, medical insurance type, diagnosis result, nursing level, number of hospital days, number of surgical days, responsible medical staff, etc.

Connect the Hospital Information System with the Digital Twin Management System, and Integrate Business Data Organically

Bedside Call System

Supports docking with the bedside call system; supports linkage with devices such as smart bracelets and smart bed pads. When call information is received, it is uploaded to the platform, and patient positioning is performed based on the digital space.

Medical Waste Management

Supports the whole-process management of medical waste in various departments.

Operating Room Management

Intuitively view the occupancy of all operating rooms in the hospital, surgical duration monitoring, operating room personnel information monitoring, patient information monitoring, and air conditioning operation monitoring in the surgical area.

Smart Infusion

Supports viewing the number of patients in the infusion room and real-time viewing of patients' infusion progress.
Supports real-time monitoring of the infusion process: timely alarm for too fast, too slow, and stopped infusion, etc., and timely processing through the linked medical staff APP.

Medical Gas Monitoring

The medical gas system can real-time detect the total pressure in each device, the gas supply pressure and gas flow at each node. When the actual detection index exceeds the set upper and lower limits of the index, real-time alarms (SMS or phone calls, etc.) remind relevant personnel to take corresponding measures.

VIP Ward

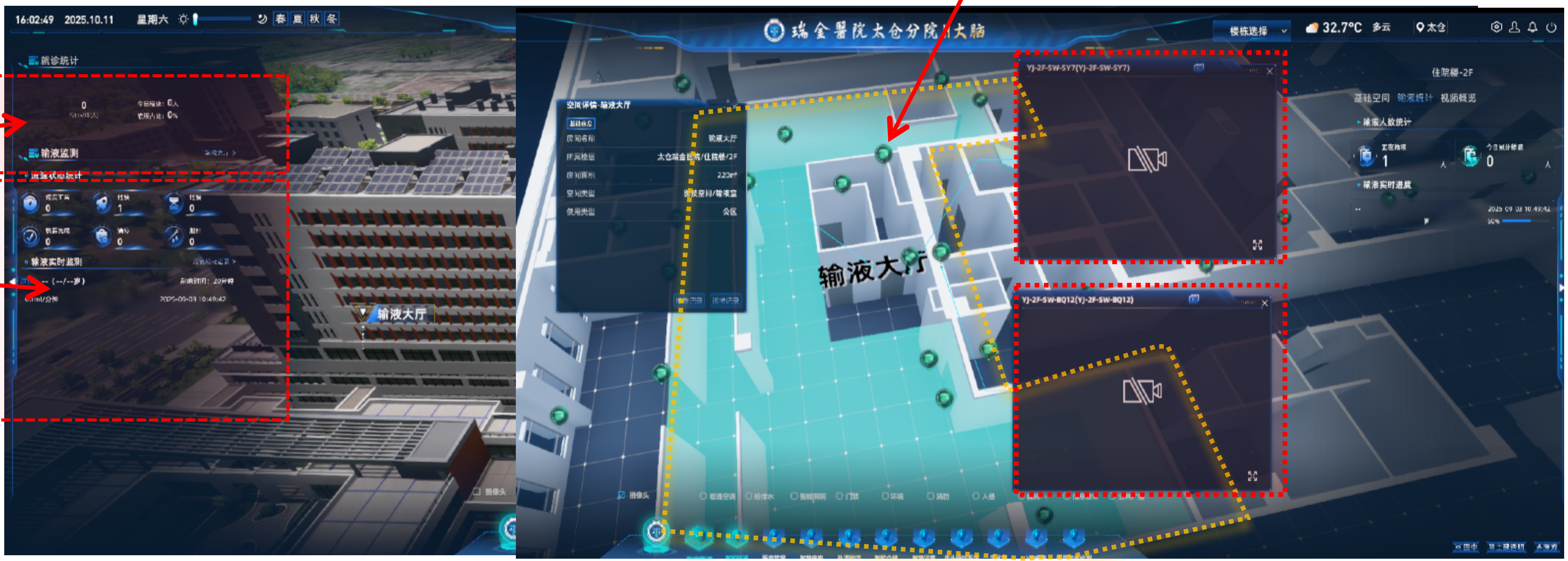
Supports bed allocation in the ward, including bed status tracking, facilitating managers to update and allocate; supports extraction of relevant information from bedside interactive screens and smart home-related information (control of air conditioners, curtains, lights).

Medical Specialty - Smart Infusion

Real-time Positioning of the Consultation Space, Linking with Surrounding Monitoring to View On-site Situations

Real-time View of the Number of Patients in the Campus on the Day

Real-time Monitoring of Infusion Equipment Status and Real-time Control of Infusion Process



Integrate intelligent infusion monitors, Internet of Things units and intelligent infusion management platforms. Based on infusion positioning in the digital twin space, it provides real-time infusion monitoring and early warning services for patients to ensure patients' infusion safety.

Medical Specialty - Medical Waste Management

•Medical Waste Type Statistics: Count the weight proportion of various types of medical waste generated by the hospital by day, month, and year.

•Cumulative Medical Waste Statistics: Count the total amount of medical waste since recording.

•Departmental Medical Waste Type Statistics: Count the different types of waste generated by each department by department.

•Daily Proportion Statistics of Medical Waste: Monitor the daily proportion statistics of different types of waste.

•Equipment Monitoring at Garbage Room Processing Center: Monitor the total number of equipment, online, fault, and offline status. Real-time viewing of video surveillance information around the garbage room in a 3D scene to achieve linked viewing.

•Robot Operation Status Monitoring: Online monitoring of operation, sleep, and fault status.

•Alarm Information: If medical waste is stored in the hospital for 48 hours, it can actively send warning information and view the details of the alarm information.

Medical Specialty - Smart Ward

- Smart Ward Statistics: Real-time viewing of bed usage status such as occupied, idle, reserved, disinfecting, and under maintenance.
- Ward Details: Display bed information for each floor of every building, including the building's floor, number of wards, number of beds, occupied beds, idle beds, update time, etc.

- Based on the 3D model space, you can view the spatial distribution of all wards in real time. You can click on a ward to view patients' basic information, medical insurance type, diagnosis result, nursing level, number of hospital days, number of surgical days, responsible medical staff, etc.
- Based on the 3D model space, you can quickly view ward alarm information and quickly check locations, and realize multi-system linkage to view surrounding real-time images simultaneously.

Medical Specialty - Track Logistics

- Monitoring of Loading Trolley: Real-time viewing of the trolley's monitoring status, including running and stopping.
- Detailed Information of Loading Trolley: View detailed information of the loading trolley, including usage times, driving mileage, electricity consumption, load capacity, etc., and real-time viewing of trajectory.
- Track Logistics Statistics: Real-time viewing of the robot's monitoring status, including running and stopping.
- Detailed Information of Robot: View detailed information of the robot, including usage times, driving mileage, electricity consumption, load capacity, etc., and real-time viewing of trajectory.

- Based on the 3D model space, you can view device details in real time. You can click to view data such as device load, electricity consumption, driving mileage, and operation trajectory.

Medical Specialty - Smart Warehousing

- Inventory Statistics: View inventory statistics, which can be categorized.
- Inventory Emergency List: View the inventory status of various drugs by category. Click on inventory details to locate and view details in the corresponding space.
- Drug Inbound and Outbound Records: View real-time inbound and outbound records of various drugs, including drug name, quantity, inbound and outbound time, etc.

- Drug Expiration Reminder: View the expiration status of various drugs by category. The platform can remind in real time based on inventory status.
- Access the warehouse management system to view real-time inventory information of the warehouse. The drug inbound and outbound statistics platform can be updated in real time.
- Expiration reminder for warehouse drugs, which can quickly locate the 3D module to view drug production information, etc.

Medical Specialty - Smart Operation

- Campus Operation Statistics: Can view appointment status, consultation status, appointment and consultation distribution, and patient information of each consulting room. Supports transmitting multimedia information such as audio-visual information, pictures, and scrolling subtitles to display terminals through the network platform, and real-time release of important information such as registration information, consultation status, medical common sense, hospital introduction, and doctor profiles.
- Campus Nurse Station Management: Supports displaying the distribution of nurse stations in the 3D BIM model. The nurse station intelligent information system connects to various nursing systems of the hospital, automatically acquires data and updates it synchronously.

Medical Specialty - Bedside Call System

- Equipment Management: Real-time viewing of the status of call system equipment. For equipment in abnormal status, it can be quickly located to the corresponding space to view equipment details.
- Real-time Call Records: Real-time viewing of call records of each ward. Managers can quickly locate the corresponding space based on call situations to understand patient conditions.
- Supports docking with the bedside call system; supports linkage with devices such as smart bracelets and smart bed pads. When call information is received, it is uploaded to the platform, and patient positioning is performed based on the digital space.

Medical Specialty - Operating Room Management

- Operating Room Statistics: The status of operating rooms can be displayed in a circular chart, including idle, in use, cleaning, etc.
- Operating Room Information: Displays the location of the operating room, surgery name, chief surgeon, patient, and elapsed time. You can click 【Locate】 to enter the single-floor operating room space.
- Operating Room Air Conditioning Statistics: Displays the total number of equipment and failure rate. Circular chart display: number of normal equipment, number of faulty equipment, and number of offline equipment.
- Operating Room Air Conditioning Statistics: Statistics the total number and quantity of each status of air conditioners in operating rooms by building + floor. Click 【Location Icon】 to enter a single operating room space on a single floor.
- Intuitively view the occupancy of all operating rooms in the hospital, surgical duration monitoring, operating room personnel information monitoring, patient information monitoring, and air conditioning operation monitoring in the surgical area.

Medical Specialty - VIP Ward

VIP Ward Statistics: Real-time viewing of VIP ward status, displayed in a circular chart including: idle, in use, etc.

VIP Ward List: Displays VIP ward location, patient name, age, department, elapsed time, etc. You can click 【Locate】 to enter the single-floor VIP ward space.

Medical Specialty - Medical Gas Monitoring

- Medical Gas Monitoring: Real-time viewing of the status of medical gas equipment, including equipment online, offline, failure rate, etc.
- Medical Gas Monitoring Data Statistics: Real-time viewing of equipment alarm trends, supporting retrieval and viewing by different time periods.
- Alarm Statistics: Real-time viewing of equipment alarm details and historical alarm data, supporting retrieval and viewing by alarm equipment name, equipment location, time, type, etc., and supporting quick positioning to the alarm space.
- The medical gas system can real-time detect the main pipe pressure in each device, the gas supply pressure and gas flow at each node. When the actual detection index exceeds the set upper and lower limits of the index, real-time alarms (SMS or phone calls, etc.) remind relevant personnel to take corresponding measures.

Smart Logistics: Smart Work Order

Ruijin Hospital Taicang Branch

- Property IOC, PC Terminal
- Property App

Report Service Management

Repair Service Management

Maintenance Service Management

Inspection Service Management

Value:

Improve Efficiency:

Based on BIM 3D visual maintenance management, complete and detailed equipment information can be obtained, and inspection and repair work can be completed quickly, making the work efficient and convenient, and improving the overall work efficiency.

Fine Management: Through the work order system, the equipment implementation status, equipment repair and maintenance records, and the performance of repair and maintenance personnel are effectively managed, improving the level of refined management.

Smart Logistics: Web-side Operation Management

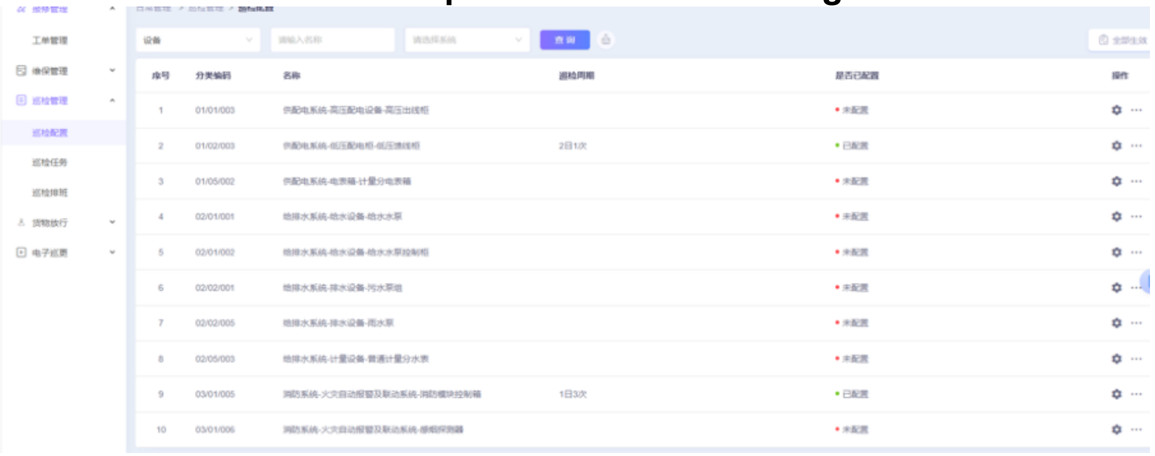
Home Page

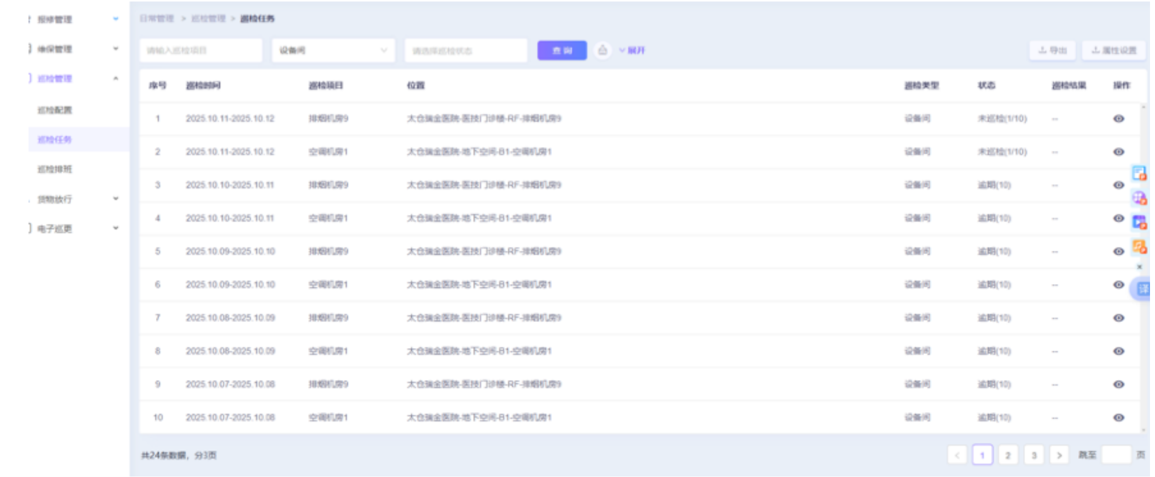
The home page displays the basic information of the campus's daily operations, including work order statistics, inspection statistics, and maintenance statistics. Through data statistics, status statistics of different businesses, and historical data analysis, managers can grasp the basic situation of the campus's operations through the home page data.

Smart Logistics: Web-side Inspection Management

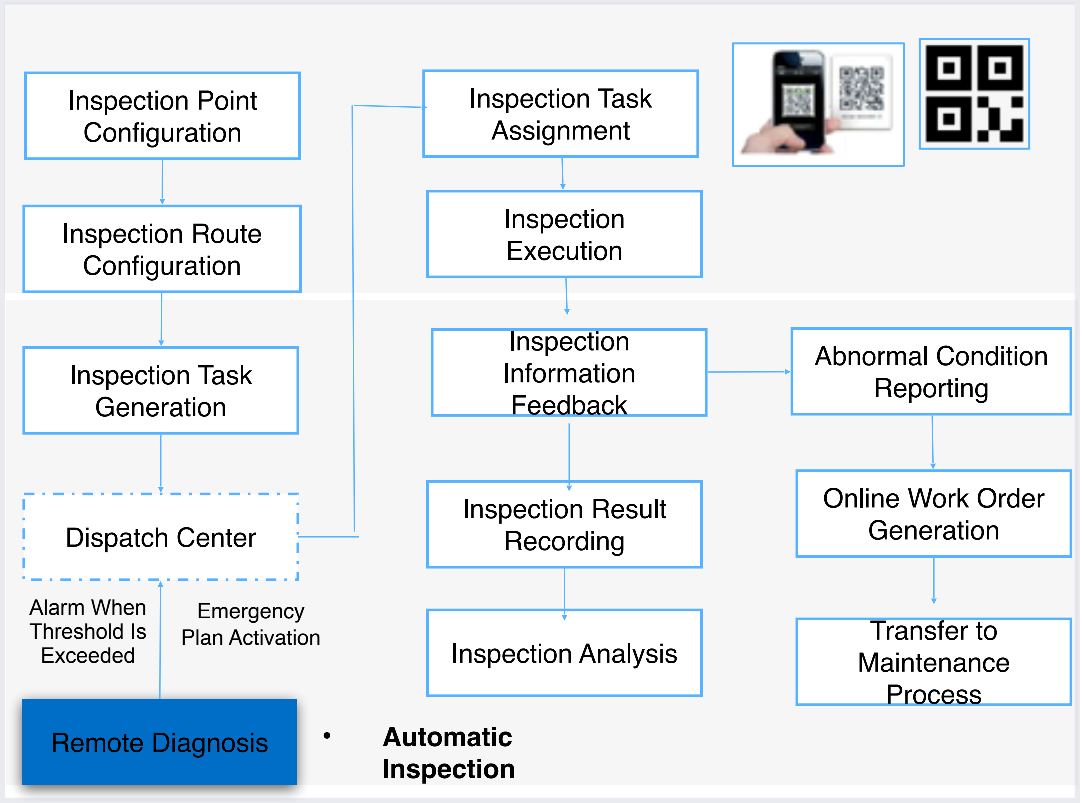
Inspection Management
Provides functions such as inspection scheduling, real-time monitoring of inspection status, statistical analysis of inspection tasks, and offline inspection.

Inspection Function Management



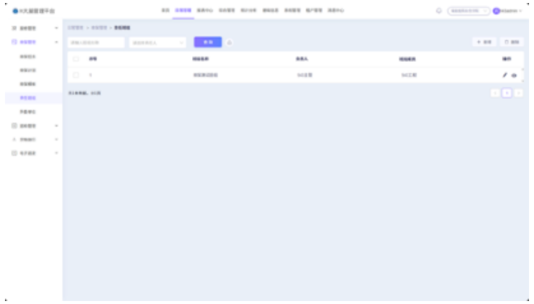


Daily Inspection Process



Smart Logistics: Web-side Maintenance Management

Maintenance Management
The property configures on the PC operation platform in the order of responsible team - maintenance template - maintenance plan. After configuration, the system automatically generates maintenance tasks every day. Engineering personnel use the APP to scan codes on site to execute maintenance tasks.

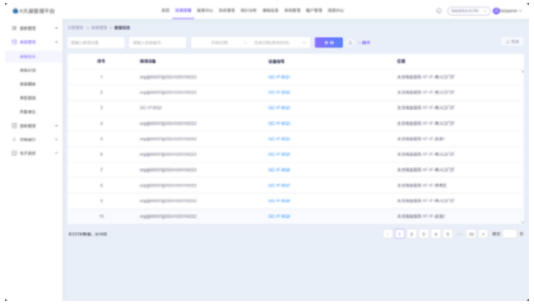


Responsible Team

Outsourced Unit

Maintenance Template

Maintenance Plan



Maintenance Task

Innovative Technology 1: Digital Twin Technology

Utilize BIM technology to build a smart hospital, achieving dynamic monitoring, real-time early warning, and precise judgment.

Real-time Weather Simulation

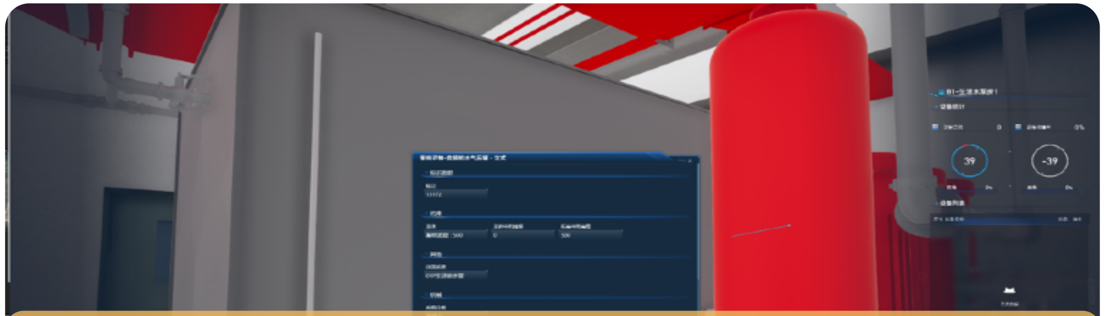
- Supports automatic matching of weather conditions for 24 hours.

Clinic Visualization

- Supports visualization of various spaces.
- Supports viewing of spatial information.

Full-scenario

- Supports custom perspective roaming in full scenarios.
- Supports viewing and roaming of hidden spaces.

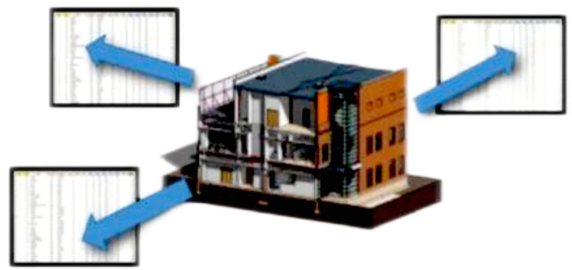


Electromechanical Visualization

- Supports viewing the real-time operation status of electromechanical equipment.
- Supports viewing the upstream and downstream logical relationships of electromechanical equipment.

Innovative Technology 2: Establish a BIM Operation and Maintenance Data Base to Achieve Data as a Service

Limitations of Conventional Solutions: Only Staying at Visualization/Model-driven



① Driven by models rather than data, slow loading and lag affect human-computer interaction experience.
② Most operation and maintenance platforms on the market: Based on game engines, the core is to make beautiful 3D displays, requiring a lot of customization work, high cost, few data management functions, and lack of data linkage.
③ Solve single-point problems, not forming a system.

H-Brain Solution: Data-driven and Data Management

Shift from application centered on model files to application centered on data and based on systems.

Digital-Analog Separation

Model Geometry File

Lightweighting Rendering

Structured BIM Attribute Data

Relational Databas

Operational Data
Business Data

Establish standard, operation and maintenance-based full data.

Geometric Data	Space Data
Coded Data	Engineering Data
Relational Data	...

Data Standard

Multi-source One Model, One Model to the End, One Model for Multiple Uses.

Unified Model Standards

Unified Technical Standards

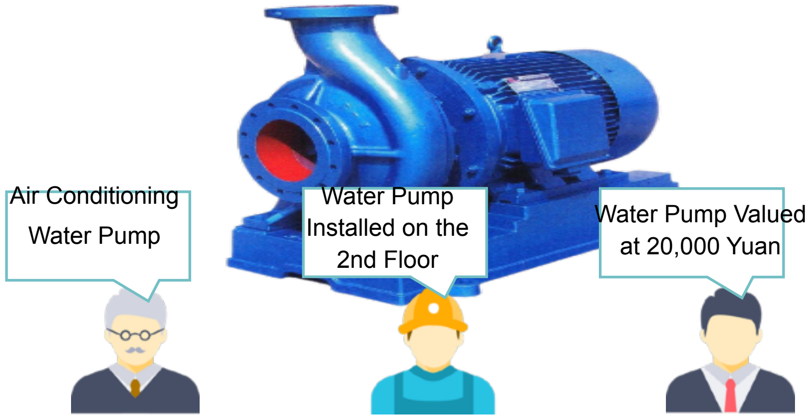
Unified Data Standards

Innovative Technology 3: Standards and Compatibility

Limitations of Conventional Solutions: Coding Fragmentation, No Unified Model Throughout

① The same component belongs to different classifications in the design, construction, and operation and maintenance stages, with different focuses: classified by profession in the design stage, by flow in the construction stage, and by asset in the operation and maintenance stage.

② Un unified coding leads to fragmentation in the upstream and downstream transmission of information throughout the entire life cycle.



H-Brain Solution: Surface Classification Method to Connect Operation and Maintenance Coding System

Serve the Entire Life Cycle of Buildings, Spanning Different Stages

Project Number + Design Code + Construction Code + Operation and Maintenance Code

Surface Classification Method: Each group of classifications is independent and parallel, with no subordinate relationship. No need to worry about repetition, and new additions do not affect others.

	综合信息分类编码规则									
编码内容	空间编码					设施设备编码				
位数	3位	2位	2位	3位	4位	2位	2位	3位	4位	3位
范围值	001-999	01-99	01-99	000-999	0000-9999	01-99	01-99	001-999	0001-9999	001-999
分支1	项目编号	区域	建筑	楼层	房间	系统	类别	类型	设备	参数
分支2		地下、裙楼或大型主楼不分楼栋的分区	楼层	防火分区	房间	系统	类别	类型	设备	参数
备注	与项目主编码进行映射	01~09代表地下区域；11~19代表裙楼区域；21~29代表一个项目分支一类型的正常区域；51~99代表一个大项目编号，不同小项目或者小项目中的区域编号		“000”代表不归属于某一楼层，但归属于某个建筑，如电梯桥厢	“0000”表示没有房间，建一个总空间；	分支2：后续编码和原来编码规则一致。针对于地下区域停车场、裙楼等不分区域，但是区分楼层和防火分区 参数分类：0XX为设备动态属性，9XX为设备共用属性（如901表示设备连接状态）				

Specifically for more than 220 categories of building operation and maintenance business, construct the logical relationship between space and equipment.

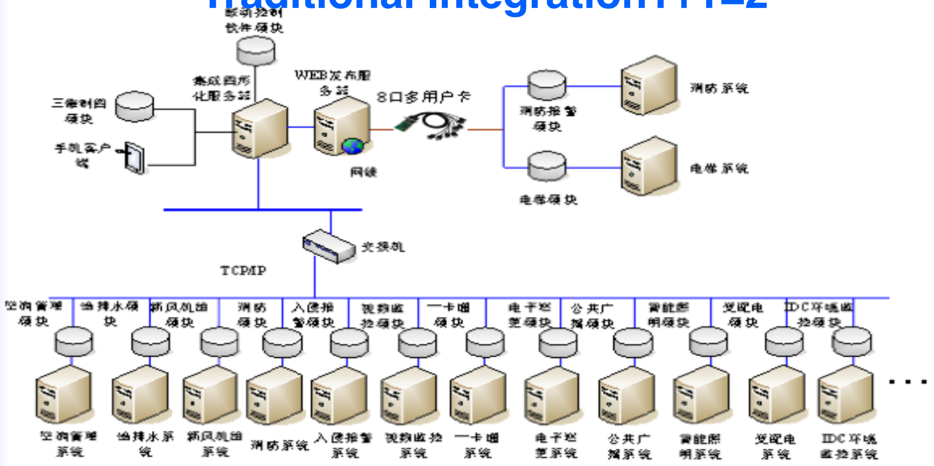
BIM Model Data + Basic Data + Business Data + Intelligent Data

- Facility Object
- Space Object
- Attribute Data
- O&M Data
- Metadata
- System Architecture

Innovative Technology 4: Scene Linkage and Business Integration

Limitations of Conventional Solutions: Single-point and Single-line Business Integration

Traditional Integration1+1=2



① Embedded data integration, without connecting the underlying data of subsystems.
② Only integrated, without integrating data, technology, and business, still in a siloed state.
③ Only conforms to the single-line process of established business. If there are innovative processes/update requirements, the process becomes cumbersome and complicated.
④ Generally does not have mobile terminal functions.

H-Brain Solution: Deep Integration of Data, Technology and Business

① Original Business Process: Check where the lights are not turned off one by one, find a broken light, determine the control range of this light (based on experience), determine the distribution box that controls the light (based on experience), contact maintenance personnel, record on paper, complete maintenance, record on paper, feedback...
② After Integration: The platform automatically inspects, proactively alarms, understands the situation, automatically dispatches work orders, and closes the loop.

More Cases

Integration with Space | Integration with Environment | Integration with Viedo | Customiz-ation

Innovative Technology 5: An Internet of Things Platform that Understands Buildings

Limitations of Conventional Solutions: Only Doing the Basics, Lacking Understanding of Buildings

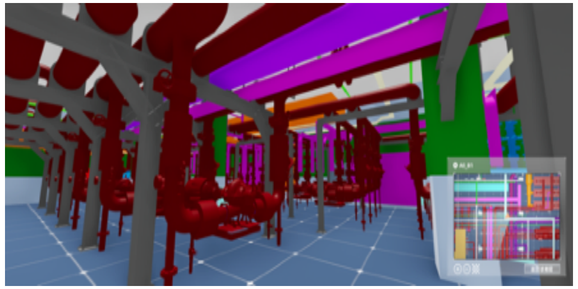
① Conventional solutions only cover system access and data reporting.

② Lack of deep insight into building characteristics, thus failing to provide sufficient data analysis and interpretation capabilities.

③ The connection between conventional IoT platforms and business is relatively weak.

H-Brain Solution: IoT Platform that Understands Buildings

Bring More Value to Building Operation and Maintenance and Data Feedback



✓ Predictive Maintenance Decision System: Maintenance Strategy + Optimization Method + Remaining Service Life Prediction

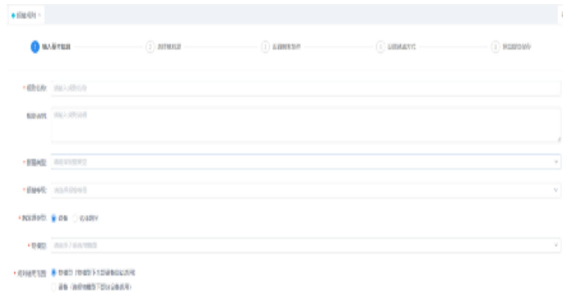
Predictive Maintenance Decision-making System

Maintenance Strategy | Optimization Method

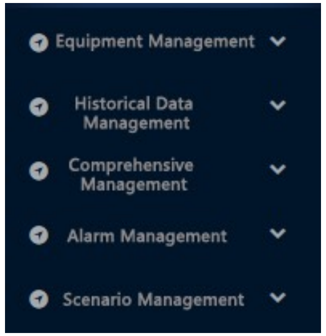
+

Remaining Useful Life Prediction

✓ Predictive Maintenance, Establishment of a Fault Database, and Elimination of Reliance on Manual Experience



✓ The platform has built-in protocol rule engines for hundreds of building systems.



✓ Highly Modular, Configurable on Demand, and Flexible for Expansion

Innovative Technology 6: De-specialization, Reducing Management Complexity

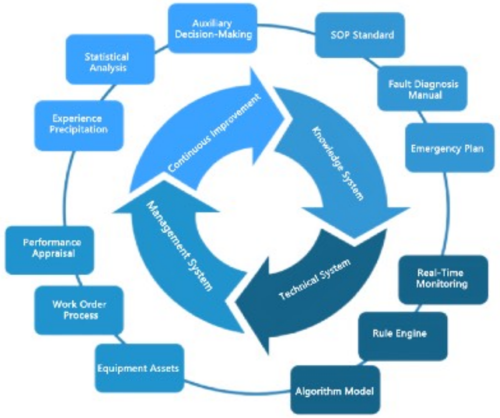
Limitations of Conventional Solutions: Only in the Integration Stage, Not Connected to Each Other

① No building operation analysis, data of each system is viewed separately, no equipment and space linkage.
② Embedded data integration, not yet connecting the underlying data of subsystems.
③ The integrated data content is limited, only integrating key system data.
④ The upstream and downstream logical relationships of equipment are unclear and uncorrelated.

H-Brain Solution: De-specialization, Reducing Management Complexity

Interactive Interface, Simple Logic, Easy to Operate; Intuitive Presentation of Complex System Relationship Diagrams

Built-in equipment logical relationships and SOP standards, no longer relying on manual experience.



Comprehensive Upgrade of Working Mode

The H-Brain management platform of Ruijin Hospital Taicang Branch integrates new technologies such as system integration modules, data management modules, and intelligent analysis modules. It comprehensively upgrades intelligent subsystem management, interface display management, campus safety management, data application management, and business work order management from traditional working modes to intelligent methods. This improves work efficiency, reduces potential safety hazards, and ensures the work and life of the project.

Intelligent Subsystem Management

System Direct, Inconsistent Rules/Data Barriers

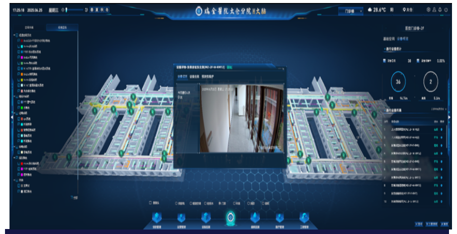
VS

IoT Integration

Interface Display Management

System No Linkage

VS



Multi-system Linkage

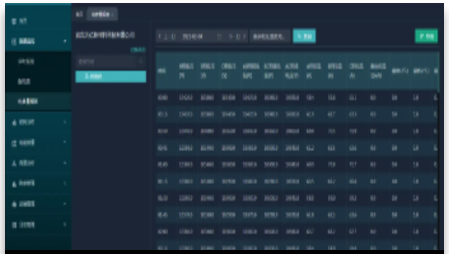
Campus Safety Management

Data No Intelligent Analysis

VS

Data Intelligent Analysis

Data Application Management



Human Viewing Data (Static)

VS

AI Hosting (Dynamic)

Business Work Order Management

Manual Reporting

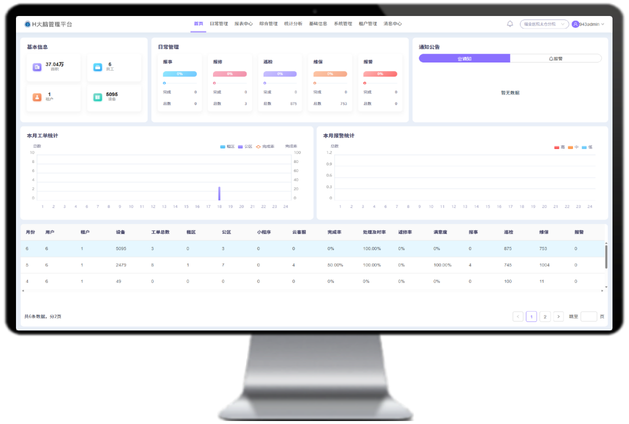
VS

Automatic Generation

Project Delivery

Large-screen Integrated Monitoring

Set operation permissions for personnel on the existing digital twin large screen in the project. Display different scenarios according to role permissions, accurately match the responsibilities of different personnel, ensure the system runs safely and efficiently, and give full play to its role in management.



Business Department PC Monitoring

Each department can view, monitor and control equipment online for the project environment through the PC terminal. Equipment control is carried out in an authorized mode, with full-process visual operation. Personnel of different roles are matched with corresponding operation permissions.

Mobile Online Supervision

Logistics personnel obtain alarm information through the mobile APP, connect with the operators of various on-site systems, and realize online supervision. The whole process is visualized and digitalized. Personnel of different roles view information at different levels.

Decentralized and Zoned Design

THANKS