



Research on The Construction of Intelligent Computer Room Management System in Universities Based on Internet of Things

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Abstract: The Internet of things system, based on the Internet, has greatly expanded the application scope of the Internet in terms of breadth and depth, making the idea and concept of "Internet +" truly implemented. Under the background of the wide application of the Internet of things, the construction of computer room in universities has gained further space and opportunities. Based on the Internet of things technology, this paper establishes the management system of University intelligent computer room, which provides reference for the construction of University intelligent computer room.

Keywords: Internet of things technology, University, Intelligent computer room, Management system.

1. Introduction

With the emergence and gradual development of the Internet, people are also expanding the application of the Internet. The Internet of things is a media form or media technology formed and developed on the basis of the Internet. The Internet of things connects the Internet, things, people and other subjects, forming a more extensive and practical network form.

In order to ensure the safe operation of communication equipment and application equipment in the computer room of universities, the coordination and cooperation of multiple systems are needed. How to realize the automatic management of each system is the focus of this paper. Under the background of the wide application of Internet of things, the construction of computer room ushered in the opportunity of innovation, and it is possible to create a more intelligent, convenient and efficient computer room application and management system. In this paper, the construction of intelligent computer room under the background of the Internet of things is studied to provide valuable reference for the rational application of the Internet of things in

the intelligent computer room.

2. Internet of things technology

As an important part of information technology in the new era, Internet of things technology is the extension and expansion of Internet technology. The core support of this technology is Internet technology. Internet of things technology is mainly used for information exchange and sharing between objects. Compared with the traditional network form, the Internet of things has more advanced sensing technology, which can obtain different formats of target information. In addition, it can use the computer network to transfer the target information to the managers accurately through the network fusion technology. In addition to providing sensor links, the Internet of things can also realize intelligent processing of information. The Internet of things technology is used to effectively integrate information sensors and information intelligent processing devices, and intelligent construction can be effectively realized through intelligent technologies such as cloud computing and pattern recognition.

3. Smart machine room

Smart computer room is a content resource platform built on the basis of cloud computing, virtualization, big data, mobile Internet and other advanced technologies. It provides the school teachers, students and parents with the network space, resource acquisition and sharing platform services required by educational informatization, as well as cloud services for teaching, scientific research, management and other applications.

The intelligent computer room system is composed of many subsystems, such as power monitoring and control subsystem, environment monitoring and control subsystem, equipment detection and control subsystem, intelligent video analysis subsystem, panoramic view subsystem, personnel monitoring and control subsystem, goods monitoring and wireless networking subsystem. The whole system is based on the construction of an integrated system with monitoring objectives covering power environment, video, personnel, security, fire protection, equipment and energy consumption, to realize the safety management system of real-time monitoring, pre-warning, in-process alarm and post evidence collection.

4. The construction of intelligent computer room system in Universities Based on Internet of things technology

Intelligent computer room has the characteristics of small computer room area, dense hardware and software assets, few management personnel and weak technical force. The previous cases have many safety accidents, and the assets are expensive and

under the very serious security risks. Therefore, it is urgent to build a highly integrated intelligent computer room monitoring system to realize real-time monitoring, pre-warning, in-process alarm and post control, storage and forensics, with remote signaling, telemetry, remote adjustment, remote control and remote vision functions. The system diagram of University intelligent computer room based on the Internet of things is shown in Figure 1.

4.1 Establishment of intelligent video behavior analysis system

Intelligent video monitoring can identify illegal intrusion and protect important assets. Among all security risks, the loss caused by stolen assets is the largest. After the computer room is stolen, the managers are worried about the stolen assets. Equipped with high-definition network camera and established video behavior analysis system. Through the establishment of intelligent video behavior analysis system, it can accurately monitor what happens in the environment, and automatically make alarm response or notify the management personnel according to the pre-set rules. It can identify suspicious objects detection, object counting, face recognition, wandering, illegal stay, property loss and other functions.

4.2 Establishment of cabinet micro environment monitoring system

At present, the traditional computer room monitoring system focuses on the overall monitoring of the computer room, but ignores the monitoring of the internal environment of the cabinet. The data of environmental monitoring in the computer room cannot reflect the parameters of the environment in which the equipment is located. Therefore, some large data centers and computer rooms with high requirements for data use cabinets for monitoring. Cabinet microenvironment monitoring mainly monitors the physical environment required by the equipment in the cabinet. Its parameters can best reflect the actual operation physical environment of the equipment, so it has a better protection effect on the data.

4.3 Establishment of remote monitoring system for air conditioning in machine room

The air conditioner in the computer room is one of the most critical equipment. The remote monitoring of the air conditioner in the computer room can automatically adjust the number of teachers and students according to the number of computers running and the number of teachers and students in the computer room. The core is to analyze and judge the signals sent by the sensors such as the computer current monitoring system, the intelligent identification system of the number of people in the room and the environmental management system (temperature, humidity, air cleanliness, etc.) Turn on or off the functions of refrigeration, heating, dehumidification and air purification.

4.4 Establishment of power supply and distribution monitoring system

Real time monitoring of the collection and monitoring of digital power parameters such

as the three-phase and single-phase output voltage, current, frequency, power, power factor, active power and reactive power, apparent power, active power and reactive power in the distribution cabinet. Monitor the important switch status of the distribution cabinet in real time. Once the working status of the power supply and distribution system is abnormal, the system will give an alarm automatically.

4.5 Establishment of water leakage detection system

A large number of precise and valuable computers and network equipment are placed in the computer room. Once there is water leakage accident in the computer room due to air conditioning or other reasons, it will cause equipment damage and information loss to the user, which will bring great, even irreparable economic loss. The requirements of temperature and humidity in the machine room are different. There are server cabinets, precision air conditioners and other equipment in the machine room. Liquid leakage often occurs. At the same time, there may also be water pipe leakage, water condensation, rainwater intrusion and other situations. This requires early detection of leakage, accurate knowledge of the location of the leakage, and timely treatment, so as to ensure the stable operation of the equipment in the machine room, which requires a comprehensive water leakage detection around the air conditioner in the machine room and in the main room. In case of water leakage, the system will give an alarm automatically.

4.6 Establishment of temperature and humidity monitoring system

Due to the influence of area, air supply equipment, server cabinet distribution and other factors, the temperature and humidity of the machine room changes unevenly, so a temperature and humidity monitoring system must be installed. Multiple temperature and humidity sensors are installed in different positions of the machine room, which can monitor the temperature and humidity on site in real time.

4.7 Establishment of fire monitoring system

The smoke status in the control room is detected by the fire controller in real time. In case of equipment fire, the on-site duty room will also give an alarm by multimedia voice and automatically call the relevant personnel to deal with the alarm at the same time. In addition, the history of random detection objects can be queried afterwards.

4.8 Establishment of intelligent machine room inspection system

Inspection of computer room is a very important part to ensure the normal operation and maintenance of information computer room, and also a very important part of information construction. As a new platform to replace the traditional manual input for machine room inspection, intelligent machine room inspection system meets the needs of machine room inspection. Add two-dimensional code labels to each equipment that needs to be inspected in the computer room, break the traditional inspection method of manual number in the computer room, and make it more convenient and efficient

for the inspection in the computer room to be connected to the network with the mobile terminal. The inspection results form various classified reports in the system, which is convenient for the maintenance personnel to understand the current operation status of the machine room more intuitively and improve the efficiency of the operation and maintenance of the machine room. The system has good system integration and can be connected with wechat public platform for system function expansion.

The equipment of each system is connected with the network to form a number of systems. Through the coordination and cooperation between the systems, a university intelligent computer room system based on the Internet of things is established (as shown in Figure 1).

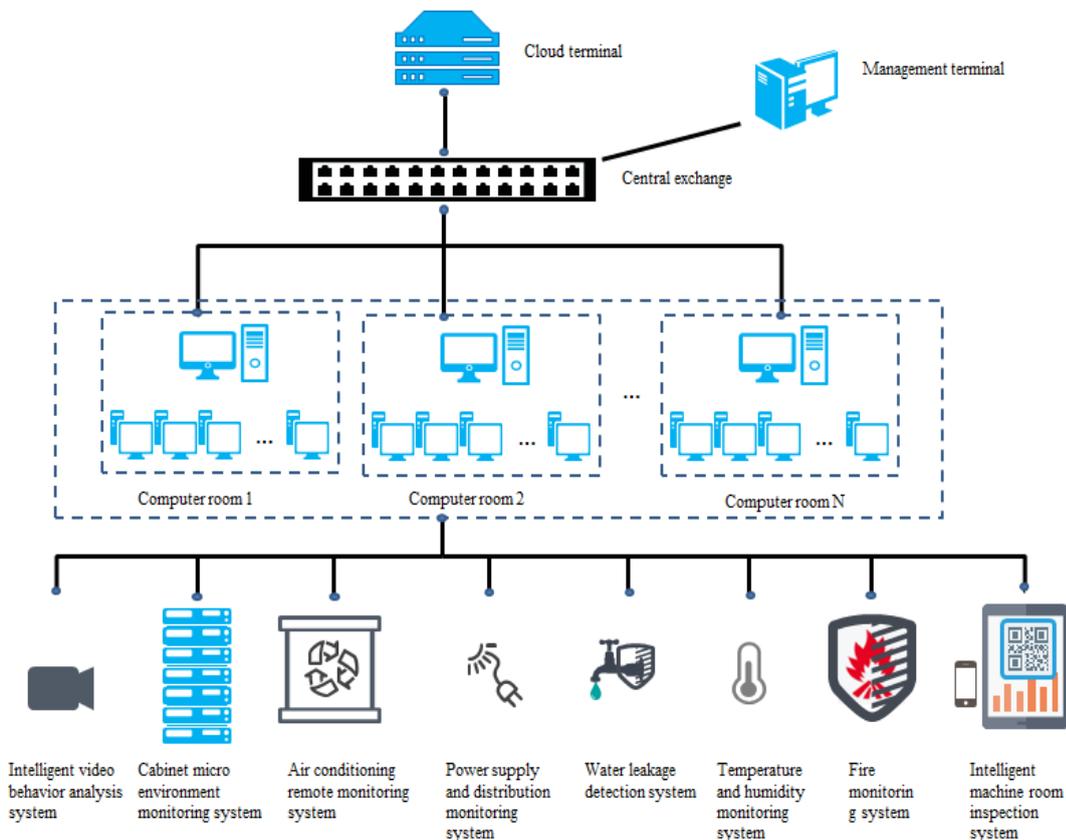


Fig 1: Construction system of intelligent computer room

5. Characteristics of operation mode of intelligent computer room system in Universities Based on Internet of things technology

(1) Automatic operation without manual intervention. Once the system has set various computer rooms to start intelligent control strategy, it will operate automatically without manual intervention; the electrical equipment in the office will automatically realize power on and power off operation without manual intervention; if it needs power beyond the normal power supply time or power supply conditions, it can only be started manually;

- (2) Full time personnel shall be responsible for unified management. The functions of user management, policy formulation, alarm limit setting, etc. in the system are managed and formulated by full-time authorized personnel, and adjusted according to the actual use and demand;
- (3) Mobile client. Relevant leaders and personnel on duty shall be equipped with mobile client equipment, which can conduct centralized monitoring and remote control on authorized equipment to achieve the purpose of monitoring and management;
- (4) Mobile client. Authorized device users can use mobile client software to remotely monitor and control authorized devices;
- (5) Abnormal alarm. All kinds of abnormal alarms detected by the system will be sent to relevant personnel for processing in time through SMS, email and microblog. The alarm information includes all parameters detected by the system, such as: personnel movement, abnormal operation, power exceeding. etc;
- (6) Intelligent learning. Through the collection and arrangement of historical data, the intelligent learning of the system is made by using neural network and other technologies to make the recognition of alarm response environment more accurate.

6. Conclusion

In this paper, under the background of the characteristics and conditions of the existing traditional computer room operation and maintenance in universities, the equipment for realizing the intelligent computer room in universities is included in the system, and then the systems are connected to the Internet. Based on the Internet of things technology, the intelligent computer room management system in universities is proposed, including intelligent video behavior analysis system, cabinet micro environment monitoring system, computer room air conditioning remote monitoring system, power supply and distribution monitoring system Water leakage detection system, temperature and humidity monitoring system, fire monitoring system, intelligent machine room inspection system, etc., further elaborated the functions and functions of each system, and finally analyzed the characteristics of the system operation mode. So that the management and maintenance of the university computer room is not so complex, greatly improving the maintenance effect and utilization rate of the computer room, and providing reference for the construction of the University intelligent computer room.

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