Integration and Development of Intelligent Building Equipment Management Information System

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Abstract. The development of Internet and communications technology have brought great influence on people in every area and changed people's lifestyle since the 21st century. With the accelerating pace of urban construction, technological innovation, a gradual increase in the level of economic development, intelligent building become a comprehensive reflection of the level of science and technology economy countries, regions, and even cities as a result of technological innovation. It has become an important pillar of the development of the construction industry. It is not only the new lifeblood of economic development, but the lifeblood of human beings sustainable development. Intelligent building provide people with a comfortable, universities, secure and convenient environment. This paper described the concept of intelligent building equipment management information system as well as its history firstly, then discussed the major equipment management information system of intelligent building, finally, researched on integrated development of intelligent building equipment management information management system, and made a wonderful prospect of the future of the development of intelligent buildings. 

Keywords: Internet, Communications technology, Urban construction, Intelligent building, Management information system.

Introduction

Intelligent buildings is also called intelligent building or intelligent building, their nature is to set the equipment, services, resources and management capabilities separated in the building into an automation system that is interrelated through the Internet to realize information and resources sharing. Intelligent building is a product of the internet age undoubtedly, it has provided people with an efficient and convenient environment with the power of the internet. Building automation, office automation, communications automation are essential parts of intelligent building.
System integration is not only to provide a unified system platform simply, but also requires consistency of data within the system to ensure standardization of interfaces and internal operational consistency between devices, hardware and software products, systems, communication networks and application software, in order to achieve coordinated building environment. From the popular sense, intelligent buildings integrated meaning that: according to the needs of the construction unit, select mature building automation, information and communication products and security devices preferably and connect them, eventually forming a complete intelligent building solutions with various types of computer hardware.

**Produce of the equipment management information system of intelligent building**

China's book "Intelligent Building Design Standards" gives the definition of intelligent building that it takes construction as platform, is the optimized combination between construction equipment, office automation and communications network systems, set structure, systems, services and management, so as to provide people with an efficient, safe building environment. In European countries, information industry changes rapidly, intelligent building is a combined product of the traditional intelligent building construction and information industry, thus they have different definition of it., which also determines the concept of intelligent building will not be fixed, but changes constantly with the progress of science and technology.

Computer technology, network technology, microelectronic technology is the basis for the final realization of intelligent building. Since the 1980s, due to the rapid development of signal transmission technology and microcomputer technology, the central control room in the building basically can control and display all devices within systems, this will greatly simplify procedures, achieve a centralized management and improve the work efficiency greatly. We can say that the development of information network technology, microelectronic technology, computer technology is a prerequisite for the realization of intelligent buildings, the birth of intelligent buildings is closely related to the social and economic development and technological innovation.

**Systematic exposition of intelligent building equipment management information**

The development of intelligent building equipment management system actually has profound social, economic, and scientific and technological background and constantly update with the development of economic and social and innovation of science and technology. Up to now, the intelligent building equipment information management system mainly includes building automation systems, communications automation systems, security automation systems, integrated wiring systems and integrated building management systems, office automation systems, fire alarm systems and so on. Intelligent building equipment management information system selected complete intelligent building management system that meet the users’ need
mostly through mutual coordination among the various subsystems of the software and hardware platform, database platform and network platforms based on the individual needs of users to achieve the best results.

1. Communication Automation System
   The function of the information communication system of intelligent buildings is to achieve transmission of data, images, voice in a building and an external communication network such as connection on the data network, satellite, computer network, wide network and the telephone network in order to achieve information transfer around the world. Communications equipment management system should consider the needs of office automation firstly, adapt to the development trend of digital, integrated, intelligent, broadband and personal communications network, provide safe and effective information and communication services to the owners such as multiple languages, images, and data, give full consideration to its adaptation to the development of public network on access network and integrated services digital network.

2. Office Automation System
   Computer and network technology enables the storage and flow of information in the system in digital form, working with the various devices within the system automatically according to a specified protocol to enable processing, transmission and use of information, which is the modern office automation system workflow. We can see office automation is integrated with multi-level technology, the formation of systems and equipment. Complete office automation system including information generated and input - processing and handling - storage and retrieval - Copy - transport and communication - information security management. Development of office automation technology are pushing office activities towards digital direction, the paperless office will be just around the corner in the future.

3. Building Automation System
   Building management subsystem, management subsystem and energy security subsystem are three components of building automation system. Building automation system can promote the harmonization of work on electricity, fire, elevators, air conditioning elevators and other equipment in intelligent building and provide scientific operation and maintenance work for its normal operation and is the guarantee of all equipment in the building operate safely and reliably.

4. Security Automation System
   Safety automation system is mainly to acquisition, transmission, monitoring and management information through the establishment of a set of strict perfect security defense system to improve the safety of buildings, the maximum to avoid the purpose of crime incidents. Alert in a certain area may occur intrusion, it’s important to capture and record related impacts timely and provide effective protection for critical areas, and realize automatic recording for important sector.

5. Automatic fire alarm system
   Fire alarm system can transmit initial fire burning smoke, fire, heat, etc. into electrical signals and to the fire alarm controller via fire detectors and displays the time and location information of occurrence, thereby that can promptly extinguish the
fire, maximize prevent damage to property and life. As long as the building fire alarm system is installed, it can warn early when there’s fire, and will not lead to major disasters, so it play an important role in fire safety and security work.

6. Cabling System

Integrated wiring system is the basic management device. When Intelligent building systems connected to various control signals 3A, it can effectively avoid the many disadvantages of traditional cabling system using modular structure, uniform standards, and twisted pair and fiber optic coaxial cable to transmit data, voice, images and monitoring signals within the building, it can fully meet the efficient, flexible and reliable requirements for intelligent building, so it is widely used in intelligent buildings.

7. Integrated Building Management System

Integrated building management systems is to control and manage the equipment automatically in the building through a unified software platform, provide communications and information services for users within buildings, Access to relevant information needed by the provided software platform such as e-mail, scientific computing, Quotes, query, etc. In addition, air-conditioning, power supply, ventilation, fire protection, drainage and other equipment in the building can also be integrated and coordinated, so that the users inside the building can get more efficient, safe, comfortable and convenient living environment, which greatly enhances the building features.

Integrated development analysis of intelligent building equipment management information management system

1. Integrated analysis of intelligent building equipment management system

System requirements of intelligent building system integration can start from the building platform, user requirements of the various subsystems and information systems based platform. Building platform as well as the building itself and the environment, buildings and district plans, structure of plumbing system and so on are all basic elements to learn building platform. Information management system is to achieve the implementation of all management applications through the application of the system operating platform for a user. This explains that before we design the intelligent building information management system, it is particularly important to learn the needs of the user as much as possible. User requirements for each system is the basis for the development of integrated systems design, it needs careful confirm between design and development party and property developers. Secondly, we need to understand the system requirements of network construction, to determine the operating environment, and the distribution system, voice data and other information points.

2. Automation integrated development of intelligent building information management system

Integrated development system is divided into two steps of the initial development and deepening the development. Descript building objectives, functional requirements, technical solutions and subsystems functionally according to user’s
needs, made a reasonable and effective suggestion about type the overall development, equipment as well as construction and so on, made estimates of the total construction budget finally, thereby facilitating the construction side to make a reasonable decision. while the systematic development is the modification of the initial development. They are all deepening development content involved that technical description of development plan, functional description and implementation of each subsystem, performance specifications, project schedule, project equipment budget, system testing and way of acceptance, engineering safeguards, as well as training and service programs.

The key to do systems integration development is depth analysis of the linkage needs and communication interface between the various subsystems, intelligent building integration system should consider the advance, standardization and openness of information exchange of the subsystem and corresponding product selected when deepening development. Openness and standardization determines the basis and the level of building information management system integration to some extent.

3. It is particularly important for security of the system in the development of intelligent building automation system

Security of the system is mainly reflected in two aspects that access control and the security of the database. First, the database is the core of automation system, security of operating system determines the security of servers and data servers, this requires regular inspection of information database to avoid incalculable losses due to accidents, so as to establish a high standard of security policies. Then, the system can manage users’ rights. The system can not only control the user's permission level, the range of data access, but also the read and write operations on the data, and allow you to delete, edit account information, and give different users different permissions and smart.

The intelligent building automation systems filtered information submitted by the user that contained illegal characters and encrypt of confidential information, and then stored in the database through assembly function itself. This made the information must be entered for verification for users to log in to ensure information security.

Significance of integrated development for intelligent building equipment management information system

1. Significantly reduce costs of operating and maintenance

Compared to the traditional inefficient and costly device management that can only rely on manual site inspections, care, intelligent management system can understand the operational status of each sub device, and adjust the equipment operation, enable alternate equipment for rapid fault zone, and repair to ensure the normal operation of building equipment through the central control room. The entire management system is highly integrated, operation and management between the various systems are also highly concentrated to achieve a good integration of resources, thereby greatly reducing the cost.
2. It is helpful for managers to improve efficiency

Security, fire and parking management often requires large amounts of labor costs, and inefficient before the development of intelligent building systems. But with complete intelligent building equipment management systems, fire protection, security and so on can automatically monitor, so you do not need a lot of patrol officers. In terms of security, it can be detected by way of the television monitor whether there is the phenomenon of illegal border crossings into buildings at key gateway, if there are unforeseen circumstances, it can achieve automatic alarm, electronic access control systems can automatically identify whether visitors can enter the building. For parking management, intelligent parking system can identify temporary vehicle and vehicle monthly automatically and realize automatic timing, charges released. For fire safety, detection alarm can automatically detect if there are signs of fires, special circumstances can be automatic alarm, display location and time of the fire, so that timely help curb the fire. This can be seen, the development of intelligent building equipment management system can greatly improve the efficiency of management.

3. Providing people with an efficient, comfortable and safe living environment

Intelligent building system achieve a harmonized scientific management, provide a certain degree of protection for the security of human and financial, and strengthen response capacity of the accident and emergency disaster. Monitor site effectively with the computer, control and optimize the combination of field devices, thereby greatly reduce the human and material resources costs, in order to bring a convenient and efficient life for people.

Summary

Integrated development of intelligent building equipment management system is the result of human technological development of modern science, it creates a comfortable, safe, efficient and convenient living environment for people. The development of intelligent building is the development direction of modern construction and is a reflect of the technological level and degree of economic development in a country, a region or a city. Integration technology is a huge project, the ultimate goal of the development of integrated technology is to apply it to real life and provide convenience. A good integrated system should fully meet business and user needs, intelligent buildings has entered our lives ,it will bring more comfortable and better life to the people in the future.

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