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Research on construction and analysis of intelligent building management system

Ran Gao^{1,*}, Yi Kun Su², Beijin Ye³¹Department of Engineering Management, School of Civil Engineering of Northeast Forestry University, Harbin, (CHINA)²Department of Communication Engineering, School of Civil Engineering, Nanjing University of Posts and Telecommunications, Nanjing, (CHINA)

E-mail: 776736249@qq.com

ABSTRACT

With the rapid development of Chinese construction industry, the intelligent building gradually entered people's life. In this paper, the intelligent building management system is designed, and its core function is to connect other subsystem or equipment to provide comprehensive access function and joint function. Intelligent building not only pursues pretty outline and stabilization, but also seeks to apply computer network, communication network and automation technology to make intelligent building safer and more comfortable. The major task of intelligent building's system integration is to establish the Intelligent Building Management System. Through the design of this system, it can achieve to integrate hardware devices and other systems conveniently, and it also can coordinate with each object which access to this system for the effective operation. Intelligent Buildings are sustainable buildings that result from the application in buildings of IT based on computer technology, and have capacities of friendliness with people and harmony with nature.

KEYWORDS

Intelligent building; Management system; Construction prediction.



INTRODUCTION

Intelligent Building (Intelligent Building), with the rapid development of information technology, people building the proposed information requirements. This can give information about the features of buildings and building systems group called intelligent building systems, also known as building weak system. Intelligent building involves many areas of information technology, may include several or even a dozen different functions subsystems. As communications technology, development of network technology and the continuous improvement of the object inside the building control function, passing information between the various subsystems greatly increased the amount of information outside the building also increased significantly^[1].

Intelligent building system integration has two meanings: First, on-site system, information integration, the second is the high-level application systems networking. Integrated intelligent building systems is the goal of coordinating the various subsystems function, the rational allocation of each subsystem equipment, take advantage of the various subsystems premise software and hardware resources, in order to provide owners with an efficient, practical and economical management tool.

Intelligent Building Management System (hereinafter referred to as IBMS system) is through a computer network and control network technology, the other major subsystems of intelligent building individual separation equipment, functions and information, the goal of intelligent building management systems for a broad system integration, so that the resources to achieve full sharing of information, the real significance of unity, practical, efficient, convenient, reliable, and low consumption purposes.

REQUIREMENTS ANALYSIS OF IBMS

Software system requirements analysis refers to the system designer to study the user needs to get something through careful investigation and research to fully understand the needs of users of the software functionality and user needs of non-formal transformed into a specification can be confirmed requirements definition, requirements definition so that it can be converted into a software design required basis^[2]. Figure 1 shows the requirements analysis of IBMS.

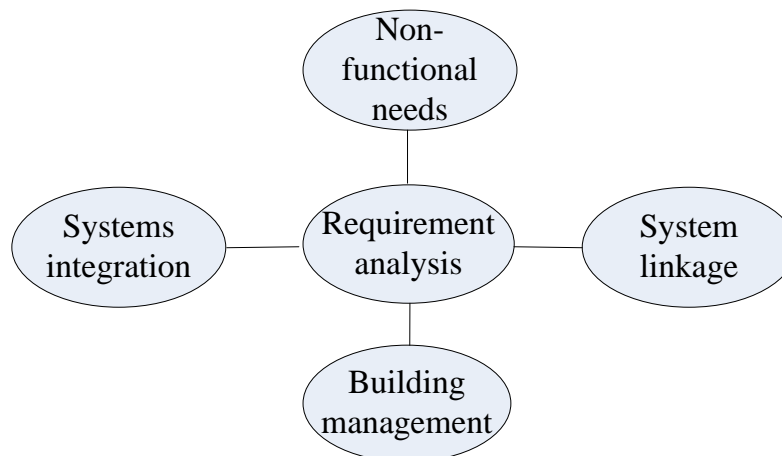


Figure 1 : The requirements analysis of IBMS

System integration is the main access to third-party devices or systems integrated intelligent building management platform, and managed to complete the work flow mainly involves three main areas, including property, equipment or system provider, system administrator. Fill in the form in accordance with the system administrator to add the device to the integrated intelligent building management platform, integrated intelligent building management platform by adding work to complete a series of objects. Integration of systems in order to achieve the ultimate management of the building, an intelligent building using object integrated management platform is the property owners of the building management or the construction of buildings on after the system integration with a certain management functions, divided building management and floor management of two aspects.

Linkage system to achieve the ultimate goal is a system integration after, otherwise each of the integrated system are isolated from each other, the information can't be interactive, so that the building can't achieve intelligent management for system administrators have the right to carry out system linkage configuration, but generally live professional engineering to accomplish this task. Permissions and access control, you must provide a centralized authority and access control module, can make intelligent building control authority on the use of integrated management platform. If you need a comprehensive management platform for intelligent building permissions to control other systems, other platforms may require access control adjustments. Intelligent Building integrated management platform provides a unified rights management interface. Provides a unified access interface personnel information, maintenance personnel information should not be restricted to add data structures^[3].

THE OVERALL DESIGN OF IBMS

Intelligent Building NMS is a complex software system, which not only can be unified management of various weak subsystems, monitoring and control, and the integration of the system should be an open system that allows different interfaces between subsystems and products and protocols to achieve interoperability, but also for the future development can have a certain adaptability. Centralized network management center point of intelligent building all the data in the network, with a large amount of data throughput, therefore, it is necessary to take such actions as the main backbone (COLLAPSED) technology, connect to the server, and the spinal cord of each division to provide maximum the reliability, flexibility and scalability.

Reliability of the design center switches and routers center is hot-swappable modular equipment. Network system in a very long period of time can't be left behind, such as network design solutions fully consider upgrading scalability of network size and network technology. The different levels of the system bandwidth need the communication bandwidth necessary to design levels. Integrated management of the virtual organization and implementation requires integrated information systems as a basis. And project management is related to the subject, the establishment of the organizational structure of the mesh of the project contract system based on integrated information system established to IT-based information through its effective control of the project organization, so that the correct project information flow and consistency is guaranteed, the organizational structure of the body through a coordinated and effective management information system. In the virtual organizational structure and integrated information systems established on the basis of the integrated management, it will be the service for the entire life cycle of building intelligent systems engineering project^[4-5].

Based on the community network system security, we recommend the use of the special needs of a new network application model, from the physical network hardware system platform is necessary to ensure that each user community the absolute privacy of the individual that is to ensure that each user has their own cell secure network mechanisms. In the aggregation layer switches are configured VCN 10 / 100M switches. Need to specify that: VCN switch has an expansion slot, support for fiber optic modules, dual-port Gigabit modules and related modules, VCN switch, because the next version is not supported by the current version will fully support, so in this case, using a fiber optic transceiver VCN10 / 100 M switch related equipment. Figure 2 shows the overall design of IBMS.

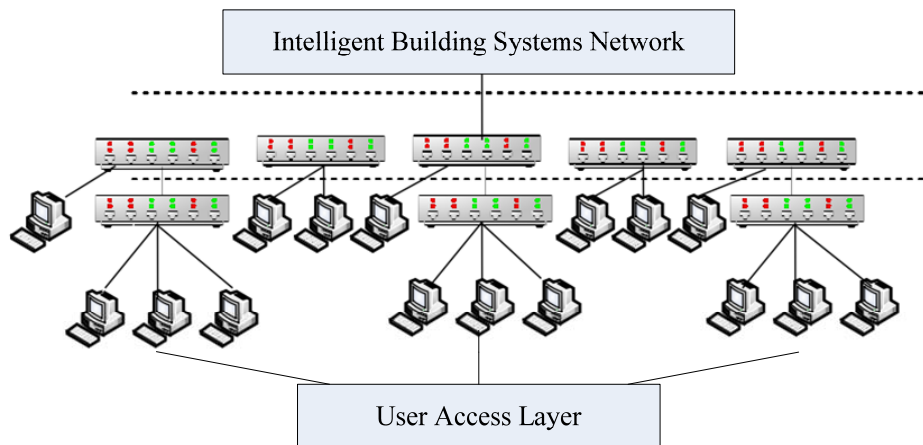


Figure 2 : The overall design of IBMS

THE MAIN TECHNICAL

OPC is a standard set includes a set of interfaces, attributes and methods, process control and manufacturing automation for. OPC is based on Microsoft's COM (Component Object Mode), DCOM (Distributed Component Object Model) and OLE (Object Linking and Embedding) technology. Use OPC client / server architecture, with plug and play functionality. OPC server provided by equipment manufacturers, which provides a standard interface to the field devices, making all kinds of information field devices can enter the OPC server, in order to achieve the underlying physical devices interconnected; while OPC server provides a standard interface to the upper application, so that the upper application OPC client program can use the data stored on the OPC server to achieve upwards of interconnection^[6-7].

Modbus / TCP protocol is part of the Modbus application protocol specification (the specification for serial communications and Ethernet communication), because of the simplicity of Modbus application layer protocol and 100Mbps Ethernet communication capabilities to make Modbus / TCP with the superior performance. Modbus / TCP protocol does not change the Modbus application protocol, and its essence can use the TCP / IP protocol for data transmission Modbus application protocol. Modbus / TCP packets using the Modbus TCP packet embedded in text mode, its low implementation cost, for a variety of applications solutions, has become the most widely supported automation protocols. In China, Modbus /

TCP network protocol has been China National Standardization Management Committee (SAC) to adopt standards for industrial automation GB / 219_5823-2004.

Web services technology is based on existing Web technologies such as HTTP, Internet on, through the development of new standards and protocols to achieve. The main protocols and standards of Web, including SOAP (Simple Object Access Protocol) Simple Object Access Protocol, WSDL (Web Services Description Language) Web Services Description Language, UDDI (Universal Description, Discovery and Integration) Universal Description, Discovery and Integration. SOAP is the core of Web services, there is provided a method of packaging the message. SOAP is using a different programming language, and the application can run on different platforms, the call can be effectively performed. SOAP does not depend on a particular language and specific transport protocol, but did not bind to the tasks of a distributed object infrastructure. It uses industry standard now realized interoperability across multiple environments.

IMPLEMENTATION OF BUILDING INTELLIGENT SYSTEMS MANAGEMENT

Intelligent building systems integration project management in order to become a systematic management, it is necessary to achieve the organizational form of non-static control and flexible management. To the intelligent building systems engineering and project management features and consistent with the rapid development of information technology, network virtual organizations with specialized areas with significant advantages rapid integration with external resources to achieve synergies, to complete the project with a very clear mission cost structure and mobility advantages of this form of organization is very effective project management, and suitable for a wide range of applications^[8]. Figure 3 shows the management model analysis of IBMS.

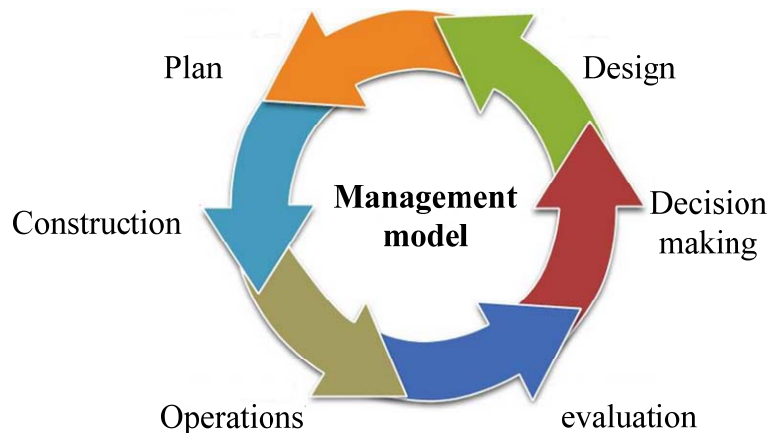


Figure 3 : The management model analysis of IBMS

Intelligent building systems engineering project there is a big difference in the nature, size and complexity of the room, and they are almost the same periodicity. Theory of this paper is to manage the project life cycle characteristics and intelligent building systems engineering project extends throughout the project cycle, including integration tasks and implementation time, the intelligent building systems engineering project life cycle is divided into the following five stages, following on the main content of the work stages elaborate. In order to make the main body of professional knowledge management into full play, and ensure that information required to be provided by the parties to timely integrated information system that allows managers to make decision-making more scientific. In order to make the advantages of network virtual organizational structure into full play, integrated management also requires the use of high-speed and effective integration of information systems^[9].

The main decision-making phase of the project included the preliminary work. Design phase needs according to the requirements put forward by the owners, the project system design, usually containing design, preliminary design and construction design, design process, equipment bidding, design liaison, equipment, research, factories and other work are also monitoring the election it contains within the range. Stage of the preparation of project construction plans and programs referred to the planning stage. Under normal circumstances it would be included in this phase of construction among the intelligent system integration projects due to a greater emphasis on the importance of the construction management program throughout the management process. Construction phase in accordance with the design drawings and construction plans specific project implementation stage, which is in the middle stages of the project. Camp stage mainly refers to the use of intelligent project from the beginning to the removal of the entire process.

CONCLUSION

With the development of the society, the intelligent devices are continually increased in the building. This paper introduces the IB background of society and technology, analyzes the functions and properties of IB, and discovers IB's basic

component and its technology system. The application of IT in IB and its impact on IB are also given. In order to realize the core functions, this thesis design and development two core function platforms, one is the collection system, one is a business system, and implement a joint function on the base of plug-in system, the final goal is to provide users with more perfect construction management functions. With the rapid development of modern information technology, make intelligent building system integration become a research focus, and for relying on in information technology to promote the building of the corresponding ascension whole function have created favorable conditions.

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