The Application of Computer Network Technology in Communication Engineering Project Management

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Abstract. Under the background of information development, the national requirements for communication engineering construction are getting higher and higher. In order to build high-quality communication engineering projects, the application of science and technology needs to be paid attention to in project management. In recent years, with the rapid development of computer network technology and the continuous expansion of its application scope, the research on the application of computer network technology in communication engineering project management has become an emerging hot topic. The previous management form has been greatly deviated from the actual demand at the present stage, and the intelligent application has gradually developed into the mainstream trend. This paper, which is based on computer network technology, can improve the quality of information and communication, relative control efficiency, respectively from the computer network information business, system management module design and system data encryption design to carry out the application research, for the computer network technology effective used in communication engineering project management, provide a reference.

Keywords: computer network technology; communication engineering; project management; application

1. Introduction

At present, there are many problems in communication project management, such as lack of scientific design management, low level of information management, and unreasonable progress management. In order to improve the efficiency of communication project management and professional level, promote the rapid development of communication engineering construction in China, research from the level of technology application analysis, summarizes the significance of computer network technology applied to communication engineering project management, based on the application of computer network technology characteristics and advantages, explore new ways and methods of communication engineering project management. Innovate the form of communication project management, make full use of computer network technology to improve the management quality, so as to enrich the relevant research theory.

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2. The application of computer network technology in communication engineering project management

There are many kinds of communication engineering. With the increasing demand for power, the application energy efficiency continues to penetrate into various fields of social development[1]. As an important force to promote the economic development of China, the innovative development of electric power enterprises is bound to have a positive impact on the social progress. From the current situation, the level of science and technology is constantly improving, which makes the technology application mode gradually show the trend of optimization and adjustment. Therefore, the development of computer network technology can also provide power guarantee for the improvement of the level of power information and communication engineering[2]. Taking the power information and communication engineering project as an example, the application of computer network technology can improve the security and stability of the system, and provide a guarantee for the long-term and stable power supply of the power communication engineering. Combine the information and communication system with the computer network technology, expand the coverage area of the information network, and promote the coordination between the various detailed projects covered in the power operation stage, so as to further improve the operation quality of the communication engineering projects[3]. The computer network system is composed of Ethernet, Internet, external router and other components. Relying on the characteristics of comprehensive optimization of computer network technical performance, it can be based on the optimization of information and communication engineering system to improve the professional level of engineering project management. The system structure of the computer network is shown in Figure Figure 1:

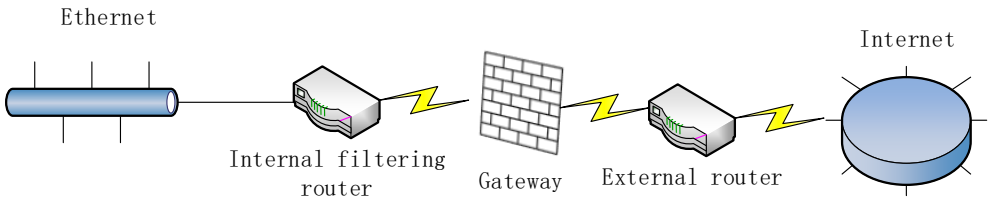

Figure 1. System Structure of the computer network

3. Problems existing in the communication engineering project management

3.1 Design management is not scientific enough

The traditional management of communication engineering projects focuses on schedule management, ignoring the importance of design management, which has a great impact on the management quality. With the increasing business type of communication, scope gradually expand, in the face of new business rapid development and the trend of science and technology innovation, because of the management concept failed to keep pace with The Times, in terms of design management, serious lack of scientific, not reasonable application of the new technology, lead to communication engineering is difficult to adapt to the new era

development form, will eventually eliminated in the intensifying competition[4]. The design scheme of communication engineering project is the core factor affecting the scientificity and rationality of project management. When the design management lacks scientificity, it cannot effectively sort out the work contents and processes of project management, which leads to the slowdown of the progress of communication engineering, and the continuous reduction of the overall construction efficiency and quality level[5].

3.2 The level of information management is relatively low

In the management of communication engineering projects, the management of information data should ensure that the data information has certain security and reliability in the process of transmission, exchange and storage, so as to provide guarantee for the safe application of data information. But from the perspective of domestic communication project management situation, in terms of information management, the overall level is low, and in the management, often appear not in strict accordance with the information data management confidentiality, availability and integrity principle to carry out the corresponding management responsibility, lead to communication project in the construction, construction and investors constraints at the same time, when any party problems, will affect the overall progress of the project.

3.3 Progress management is not reasonable enough

The construction quality of communication engineering is closely related to the project construction progress of the project. In the project construction management, due to the unreasonable problems in the progress management, the construction progress of the project is not strictly controlled according to the relevant regulations, which leads to the extension of the project construction time, higher construction cost, and unnecessary waste of human and material resources. It will not only affect the overall progress of the communication project, but also reduce customer satisfaction, damage the external image of the enterprise, and is not conducive to the long-term development and competition of the enterprise. Due to the ineffective schedule management control, it hinders the construction work of communication projects, resulting in the reduction of project construction efficiency and quality, which may produce a variety of risks and hidden dangers, and ultimately cause irreparable economic losses to the project builder[6].

4. The Application of Computer Network Technology in Communication Engineering Project Management

4.1 Computer network information service

The communication industry directly affects people's vital interests, and involves many contents. Therefore, it is necessary to ensure its safe and stable operation, so as to meet people's demand for power information business. In the current situation, the computer network information and communication services than more, generally speaking, there are the following points:

(1) Administrative telephone and dispatch telephone. In the process of administrative work and power dispatching, the service can realize efficient information communication, and the

service has relatively high requirements for connection speed.

(2) Video monitoring information of substation, using network technology in substation and other key locations, so as to ensure the stability and security of power information communication.

(3) Management information system, referred to as MIS, using network technology to realize the information networking between computers in various departments. The system can also provide relevant query functions, so that the efficiency and quality of information communication can be improved, and the resource information sharing among various departments can be realized.

(4) The real-time information data of power grid dispatching automation, which is reflected in the transmission of real-time data information to the power center. It can ensure the accuracy and effectiveness of information acquisition in the power dispatching, and reduce the network delay to a large extent.

(5) Relay protection signal by utilizing G in PCM equipment. The 703 / 64 kbps interface is connected to the SDH transmission platform. If there is no relay protection signal, the effectiveness of information transmission is difficult to be guaranteed, so this service is the key basis for the realization of power information communication.

At present, China's traditional information and communication network is mainly based on TDM voice communication. Driven by the development of information technology, more IP data services in the future, and the information services carried out by computer network technology are as shown in Table 1.

Table 1. Computer network information service

Business name	type of service	propagation velocity	transmission delay	serviceability	integrity	Communication configuration
data service	MIS	4M	Second level	centre	tall	Two-way / broadcast
Voice business	dispatcher telephone	64K	≤250m/s	tall	tall	two-way
	Administrative telephone	64K	≤250m/s	tall	same as	two-way
multimedia service	GIS	512K	Second level	higher	higher	-
	network application	21M	Second level	centre	centre	-
	video conferencing	2M	≤400m/s	higher	centre	Two-way / broadcast
	Video surveillance	2M	≤400m/s	higher	centre	Two-way / broadcast

4.2 System management module design

Using the computer network technology, the communication engineering project management can be divided into 8 modules, and the structure is shown in Figure 2:

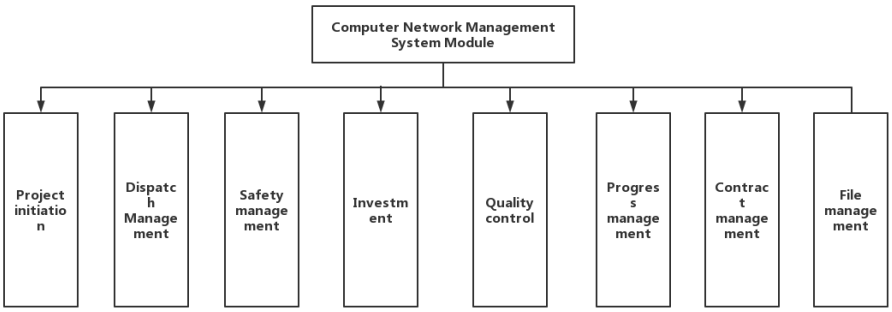

Figure 2. Computer network system management module structure

The design of the computer network system management module has the following characteristics:

(1) APP single delivery system. Combine the construction of different types of business with the acceptance specification of communication projects, clarify the project construction standard and system basis, and use the APP dispatching system to make the work of communication project construction more reasonable and standardized, so as to follow rules to improve the technical level of project management of relevant staff; (2) unified platform. Use the unified platform to realize data and information sharing, manage the construction party, supervisor, designer, construction party and multiple communication project management subjects in the same platform, strengthen the coordination of all parties, ensure the orderly construction of the project, and ensure the construction progress of the communication project; (3) file management. In the process of project construction, strengthen the scientific management of all kinds of data, file and store all the data in time, and build the process track of data transmission and storage to provide the basis for the subsequent use and maintenance; (4) photo acceptance. Based on the characteristics of the remote control of the computer network, the relevant pictures are checked in the way of remote acceptance, and the high-quality site construction is realized through the coverage of the whole site construction.

4.3 Design of the system data encryption

In order to strengthen the security of communication engineering project management, the computer network technology can be applied to generate a public key pair with a public key and a private key as a typical network key based on the asymmetric key RSA in the system. The public key is used for encryption, and the data in the communication project is transmitted to the project manager of the public key, while the private key is only owned by the project manager, which has strong privacy, belongs to the core secret of the communication project, and plays the decryption of all kinds of data in the project construction. The application of computer network technology can use different keys in data encryption and decryption. The encryption and decryption formulas using the RSA algorithm are shown in Table 2.

Table 2. List of key elements of RSA

public key PR	N: The product of two primes, p and q E: mutually prime products with (q-1) and (p-1)
private key PU	N: The product of two primes, p and q d: $e^{-1}(\mathrm{mod}\ (p-1)\ (q-1))$
Encryption formula	$c = m^e \bmod n$
Decryption formula	$m = c^d \bmod n$

Based on the formula in the table, when the encryption calculation length is long, the segmentation operation should be taken, while the decryption calculation can be regarded as the realization of the relationship between plaintext length and key length in RSA algorithm. Through RSA key encryption and decryption, it can provide security guarantee for the data management of communication engineering projects, and make the transmission, storage and application of data and information stable and reliable.

5. Conclusion

Based on the realistic background of the increasing demand for communication project construction, this paper analyzes the existing problems of communication project project management. To enhance the design management is scientific, improve the level of information management, reasonable progress management, research around the application of computer network technology, combined with the significance and value of communication engineering project management, put forward the application of computer network technology, in order to realize the effective combination of communication engineering project management and computer network technology, to improve the efficiency and quality of communication project management, provide a reference. Based on the concept and method of innovative management, we can promote the quality of communication engineering management and construction to improve continuously, and fully reflect the value and significance of computer network technology in the communication engineering project management.

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