

Research on the application of electronic information technology in construction engineering

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Abstract. According to the renovation needs of construction projects and the actual situation of the site, it is necessary to closely combine the application of electronic information technology to provide solid technical support for the smooth implementation of the renovation plan, aiming to optimize and improve the performance of the building structure, and effectively prevent possible problems in the transformation process and subsequent applications. In addition, in the process of strengthening the effectiveness of construction engineering transformation and promoting the progress of the construction industry, it is necessary to deeply analyze the changes in the current situation, deeply think about the integration and application strategy of electronic information technology, and ensure that the transformation project can achieve the expected results and realize the full and efficient use of information resources. This measure can not only significantly reduce the potential risks in the transformation of construction projects, ensure the successful completion of the transformation tasks, but also help to adapt to the development of the times, maximize the advantages of electronic information technology, and inject new vitality into the transformation of construction projects.

Keywords: electronic information technology, Construction, study

1. Overview of construction engineering and electronic information technology

1.1. Overview of construction projects

Construction engineering refers to the process of transforming land resources and building materials into buildings with specific functions and use value through a series of design, construction, management and other links. It covers a variety of types such as residential, commercial buildings, public facilities, infrastructure, etc., and is designed to meet the diverse needs of people to live, work, study, and play. Construction projects not only require a safe and stable structure, perfect and reasonable functions [1], but also pay attention to aesthetics and environmental protection, and reflect humanistic care and the characteristics of the times. With the progress of science and technology, construction projects are increasingly developing in the direction of intelligence and greening, and the continuous emergence of new materials, new processes and new technologies has injected new vitality into the sustainable development of construction projects.

1.2. Overview of electronic information technology

Electronic information technology, abbreviated as EIT, is an interdisciplinary technical field that integrates electronic technology and information technology. It mainly uses electronic devices and electronic circuits to process, store, transmit, and display information. Electronic information technology not only covers the manufacture and application of electronic equipment, but also involves the development and maintenance of information systems. Through high-speed data transmission and processing, this technology realizes real-time, fast and accurate collection, transmission, processing and distribution of information, which is an important cornerstone of informatization and intelligence in modern society. With the continuous development of science and technology, electronic information technology has been widely used in communications, computers, automation control, medical health, consumer electronics and other fields, becoming a key force to promote social progress and economic development. Discussion on the application of electronic information technology in construction engineering

2. Discussion on the application of electronic information technology in construction engineering

2.1. Application of BIM technology

BIM technology, or Building Information Modeling, is an advanced design and management tool that integrates electronic technology and information technology, which uses digital modeling methods, combined with building physical models, databases and computer technology to achieve information integration, sharing and management. In the field of architecture, BIM technology is widely used in design, construction, operation and maintenance and other stages to help designers quickly generate architectural models and analyze energy consumption and lighting, so as to improve design quality. In construction management, BIM technology helps project forecasting, resource optimization and schedule control, and improves construction efficiency. In the operation and maintenance phase, BIM technology supports equipment maintenance, energy management, and safety monitoring to improve operation and maintenance efficiency. In addition, BIM technology also has the advantages of visualization, integration, parameterization, simulation, coordination, optimization, drawingability and information completeness, providing more scientific, efficient and accurate solutions for urban planning, civil engineering, industrial design and interior design, and promoting the digital transformation and development of the construction industry.

2.2. Application of information management system

Through the integration of information technology means, such as database management, network communication, cloud computing, etc., the information management system realizes the systematization [2], automatic processing and monitoring of all kinds of information in the process of enterprise or project operation. The system can efficiently collect, integrate, analyze and display data, improve the efficiency and accuracy of decision-making, optimize resource allocation, and strengthen process management, so as to comprehensively improve the operational efficiency and management level of enterprises or projects, and is an indispensable and important tool in modern enterprise or project management.

3. Problems faced by electronic information technology in the process of construction engineering

In the field of construction engineering, the rapid development of electronic information technology provides strong support for the efficient management and intelligent construction of projects. However, this process has not been smooth sailing, and businesses face multiple challenges when applying these advanced technologies. The following is a detailed analysis of these challenges and corresponding strategies to help construction companies better use electronic information technology to improve project management.

3.1. Technology acceptance and application capabilities

With the rise of electronic information technology such as BIM (Building Information Modeling) and intelligent monitoring systems, some construction enterprises and construction teams have limited acceptance and application capabilities of new technologies [3], which has become a key factor restricting the popularization and application of technology. When a large construction company introduced BIM technology for project management, the team members were not familiar with the new technology, which led to difficulties in the initial implementation of the project and hindered the progress.

3.2. Data security and privacy protection

With the improvement of the informatization degree of construction projects, the issue of data security and privacy protection has become increasingly prominent, and how to ensure that sensitive data is not leaked has become an important challenge for enterprises. In a smart construction site project, due to improper data protection measures, the surveillance video of the construction site was illegally accessed, and sensitive information was leaked.

3.3. Talent shortage

With the rapid development of electronic information technology, construction enterprises have an increasing demand for talents with relevant skills, but the supply of professionals in the market is insufficient, resulting in a prominent shortage of talents [4]. When a high-rise building project was moving forward with intelligent management systems, it found that the existing team lacked professionals who could skillfully operate and maintain these systems.

3.4. System integration & compatibility

There may be compatibility issues between software and hardware systems provided by different vendors, resulting in the unsmooth flow of data, affecting the efficiency and accuracy of project management. In a comprehensive construction project, due to compatibility problems between systems, the data could not be synchronized in time, which affected the project schedule.

3.5. Technology costs and return on investment

When introducing electronic information technology, construction companies need to balance the cost of technology with the return on investment to ensure the economic viability of the project. Small and medium-sized construction companies are hesitant to adopt new technologies because they are worried that the initial investment will be too high.

4. Strategies for the application of electronic information technology in the construction engineering process

With the rapid development of science and technology, electronic information technology has been widely used in the field of construction engineering, which has greatly improved the efficiency and quality of project management. However, how to apply these technologies efficiently and safely is still an important topic that construction enterprises need to continue to explore and practice. The following is a detailed discussion of the application strategies of electronic information technology in the construction process.

4.1. Clarify the objectives of technology application

Before applying electronic information technology, construction companies first need to clarify the goals of technology application. This includes improving project management efficiency, optimizing resource allocation, ensuring construction safety, and improving project quality. Defining goals helps companies to select the right technology in a targeted manner and develop a plan for their application.

4.2. Strengthen technical training and talent reserve

The application of electronic information technology is inseparable from the support of professional talents. Therefore, construction companies need to strengthen the technical training of employees and improve the technical level of their teams [5]. At the same time, we will actively introduce and train professionals with electronic information technology, and establish a talent reserve mechanism to provide a strong guarantee for the continuous application and innovation of technology.

4.3. Build an information management platform

In order to effectively manage all kinds of information in the process of construction projects, construction enterprises need to build an information management platform. The platform should be able to integrate multiple functional modules such as project management, resource scheduling, safety monitoring, and quality control to achieve real-time sharing and efficient processing of information. Through the information management platform, enterprises can more easily grasp the progress of the project, find and solve problems in time.

4.4. Optimize technology selection and integration

When choosing electronic information technology, construction companies need to fully consider the applicability, stability and cost-effectiveness of the technology. At the same time, we pay attention to the integration of technology to ensure that different systems can be seamlessly connected to achieve the smooth flow of data. By optimizing technology selection and integration, enterprises can build an efficient, stable and secure information management system.

4.5. Strengthen data security and privacy protection

With the improvement of the degree of informatization of construction projects, the problems of data security and privacy protection have become increasingly prominent. Construction companies need to establish a sound data security system, using advanced encryption technology, firewalls, and intrusion detection systems to ensure that sensitive data is not leaked. At the same time, strengthen the data security awareness training of employees to improve the overall level of data protection.

4.6. Promote technological innovation and upgrading

With the rapid development of electronic information technology, construction enterprises need to keep up with the development trend of technology and continuously promote technological innovation and upgrading. Through the introduction of new technologies, research and development of new products, optimization of existing systems, etc., and constantly improve the technical strength and competitiveness of enterprises. At the same time, strengthen cooperation with scientific research institutions, universities and other universities to jointly promote the informatization process of the construction industry.

4.7. Improve the system of laws, regulations and standards

In order to standardize the application of electronic information technology in construction projects, construction enterprises need to actively pay attention to the formulation and update of relevant laws, regulations and standards. By complying with laws, regulations [6], and industry standards, companies can ensure the legal and compliant application of technology and reduce potential legal risks. At the same time, actively participate in the formulation of industry standards to promote the technological progress and standardized development of the industry.

4.8. Strengthen cooperation and sharing

The application of electronic information technology in construction engineering involves many fields and links, which requires the joint efforts and cooperation of all parties. Construction enterprises should strengthen communication and collaboration with suppliers, design units, construction units and other partners to jointly promote the innovation and application of technology. At the same time, it actively participates in industry exchanges and cooperation activities, shares experience and technological achievements, and promotes the informatization development of the entire construction industry.

5. Conclusion

To sum up, the application strategy of electronic information technology in the process of construction engineering needs to comprehensively consider the technology application objectives, technical training and talent reserve, information management platform construction, technology selection and integration, data security and privacy protection, technological innovation and upgrading, laws, regulations and standard systems, cooperation and sharing. By formulating and implementing these strategies, construction companies can make more efficient use of electronic information technology to improve project management and project quality, and contribute to the sustainable development of the construction industry.

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