

On the Current Situation of Safety Management in Civil Engineering Construction

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Abstract: Civil engineering information management is a mature and young subject, mature is civil engineering, civil engineering practice has been carried out for thousands of years, such as Qin Shi Huang built the Great Wall. The youngest is the information management of civil engineering, which ensures that the cost, quality, schedule and safety of the project are fully controlled through information management. Civil engineering information management is an emerging discipline that has only been proposed in recent years with the modernization of project management. Although some results have been received, there are still some problems. In order to solve these problems, it is necessary to clarify the significance of information management, discover problems in a timely manner, solve problems, and realize the informatization of construction project management as much as possible. Therefore, this paper discusses the practice of information construction of engineering project management.

Keywords: Informatization; Emerging Disciplines; Project Management; Civil Engineering.

1. Introduction

In the 21st century, with the advent of the information age, engineering project management will inevitably move towards information-based management, and the core competitiveness of project management will increasingly rely on information technology. Only by fully utilizing high-tech, including information technology, can we enhance project management capabilities and technological means, enhance competitiveness, achieve leapfrog development, and align with the international construction industry.

The integration and development of informatization and construction industry is one of the important contents of the 13th Five Year Plan for the development of the construction industry. The integrated application of Building Information Modeling (BIM) is not only a key technical support for improving engineering construction capabilities, building industry informatization construction, and modernization development of the construction industry, but also an important medium for promoting the deep integration of big data and the real economy, and optimizing modern engineering technology in the construction industry. Engineering information is the core of BIM, which is a signal, measurement, and representation that reflects the movement, development, and changes of people, finance, and materials throughout the entire lifecycle of construction projects. It is also a key interactive medium that supports the application of BIM in construction projects; This means that the application of BIM in construction projects relies on information as the carrier of engineering judgment, and the effective acquisition, transmission, processing, output, and feedback of information are the key to BIM project management.

With the continuous development and progress of science and technology, society has entered the era of informatization. At the same time, actively utilizing information technology to drive the development of modern industry has become an important means of development and progress in various countries. As an important category in industrial construction, civil engineering can build various construction projects for humanity, whether it is residential environment or public facilities, which cannot be separated. With the construction of

important transportation infrastructure in China, higher and stricter requirements have been put forward for civil engineering. Therefore, applying information technology to the construction of civil engineering is an important measure to achieve leapfrog development in civil engineering. Therefore, this article explores the current situation of informatization construction in engineering project management.

2. BIM Technique

2.1. What is BIM technology

Building Information Modeling (BIM) is the process of designing, constructing, and managing projects through the creation and utilization of digital models.

The so-called Building Information Model (BIM) refers to simulating the real information of a building through digital information simulation. Here, the connotation of information is not only visual information describing geometric shapes, but also includes a large amount of non geometric information, such as material fire resistance rating, material heat transfer coefficient, component cost, procurement information, etc. In fact, BIM is the use of digital technology to establish a virtual building in a computer, and a building information model provides a single, complete, consistent, and logical building information database.

2.2. The application value of BIM technology in the construction phase

BIM technology is a technological model that runs through the entire process of construction life. The construction phase of engineering construction. It is a key link in turning construction project planning and design into reality. The establishment of a project management information system based on BIM application by construction enterprises can improve the level of construction, ensure construction quality, and obtain more economic benefits. The specific application value of BIM technology in the construction phase is reflected in the following aspects:

(1) 3D rendering, promotional display, giving people a sense

of realism and direct visual impact. Based on the construction plan, visually display the layout of the site and large equipment, the construction plan for complex nodes, the selection of construction sequence, conduct 4D simulation, and compare and select different construction plans. The built BIM model can serve as the model foundation for secondary rendering development. Greatly improving the accuracy and efficiency of 3D rendering, providing owners with a more intuitive promotional presentation, and increasing the chances of winning the bid. For example, the application of reverse construction in the headquarters building of Zhejiang Commercial Bank, Zhejiang Newspaper Building, and subway cover excavation of Zhejiang Construction Engineering Group has achieved good results.

(2) Fast computation, significantly improving accuracy. The creation of BIM database is achieved by establishing a 6D associated database. It can accurately and quickly calculate the engineering quantity, improve the accuracy and efficiency of construction budgeting. Due to the component level data granularity of the BIM database, it can quickly provide the data information required to support the management of various project lines, effectively improving the efficiency of construction management. By using BIM models to extract materials, equipment statistics, control costs, and predict cost, a reasonable basis is provided for project bidding and cost control during the construction process for construction units.

3. Civil Engineering Information Management

3.1. The connotation of civil engineering information management

(1) From a technical perspective, civil engineering informatization refers to a new technology diffusion process that focuses on the development and utilization of civil engineering information technology resources nationwide and even globally, relying on high-tech means such as network technology and communication technology. By achieving online and shared civil engineering information, civil engineering information support and complete problem solutions are provided in a anytime, anywhere, and interactive manner.

(2) From the perspective of industry influence, civil engineering informatization is a process of utilizing information technology to improve the overall level of civil engineering construction and management. It covers many fields such as government supervision, enterprise management, education and training, surveying, design, construction, supervision, quality supervision, etc. Especially in response to the actual situation in China, civil engineering informatization effectively solves the contradiction between the large and extensive construction volume and the serious uneven distribution of information knowledge resources, promoting overall technological progress.

(3) From the perspective of implementation process, like informationization in other industries, civil engineering informationization is also a dynamic process that includes three levels and six major elements. The so-called three levels refer to the development and application process of civil engineering information technology, which mainly refers to the formulation of network transmission standards for civil engineering information in software and hardware based on information technology such as the Internet, and the vigorous

development of transmission terminals for civil engineering information, which is the foundation of informationization construction; The second is the development and utilization process of civil engineering information resources, mainly referring to the construction of the national civil engineering information public network and enterprise local area network as the provider of civil engineering information, which is the core and key of information construction; The third is the continuous development process of the civil engineering information product manufacturing industry, mainly referring to the development of a group of scientific research institutions and enterprises for the development and manufacturing of civil engineering information technology, which is an important support for information construction. The so-called six elements refer to information networks, information soap, resources, information technology, information industry, information regulatory environment, and information talents. Conclusion

The manuscript should include a conclusion. In this section, summarize what was described in your paper. Future directions may also be included in this section. Authors are strongly encouraged not to reference multiple figures or tables in the conclusion; these should be referenced in the body of the paper.

3.2. The necessity of developing civil engineering information management

In China's economic construction, the construction industry has played a huge role as an important pillar industry. With the continuous development of science and technology, the rapid development of the Internet, and the advent of the information age, it has had a great impact on the construction of civil engineering in the construction industry. The application of information technology in civil engineering construction has received great attention, and its application areas are constantly deepening. The informatization construction of civil engineering can not only effectively improve the construction quality and efficiency of civil engineering, but also promote the continuous progress and development of the entire civil engineering industry.

The so-called civil engineering informatization construction refers to the use of Internet information technology and advanced communication technology as a basis, involving various aspects of civil engineering construction, such as engineering management, engineering technology training, government supervision, and quality supervision. It enables the online sharing of civil engineering technical resources and can provide relevant solutions for civil engineering construction at any time and effectively. In short, the informatization of civil engineering can effectively compensate for the problems of large quantity of civil engineering, uneven technical level, and uneven distribution of civil engineering information; Not only is it conducive to internal communication and cooperation in the civil engineering industry, but it also promotes the continuous improvement and progress of the technical level of the entire civil engineering industry. In addition, the informatization of civil engineering can also make the design of civil engineering schemes more convenient, facilitate close communication between the design and construction parties, and promote the improvement of engineering construction efficiency and quality enhancement. The informatization of civil engineering has the characteristics of interactivity, real-time, and remoteness, which makes the use of related

resources in civil engineering very convenient and breaks down the barriers of time and space. At the same time, for civil engineering construction, the informatization of civil engineering realizes the networking and intelligence of soil and wood engineering construction, bringing revolutionary changes to the design and construction methods of civil engineering construction.

3.3. Current issues in the development of civil engineering information management

Overall, the level of informatization in construction units in China is still relatively low. In most current construction projects, extensive management methods are still used. Not only is the management mode relatively single, but also the management is chaotic. There are generally phenomena of decision-making without basis, repeated reporting without reporting, and giving orders with a slap in the head, and the level of informatization is also very low. Although the current construction projects have more participants, more complex investment situations, and larger investment amounts than in the past, they are still managed according to the old methods in these construction units.

(1) Most domestic units do not have a deep understanding of informatization, only believing that being able to receive and send emails and access the internet can achieve information management. However, there is no concept of the core functions of informatization, such as real-time monitoring of engineering, standardization of workflow, strengthening of organization and coordination, planning and scheduling of resources, prediction of engineering changes, measurement of engineering costs, proposal of engineering warnings, and identification of engineering risks. The attitude towards informatization is, on the one hand, willing to adopt it, but on the other hand, concerned that it may cause additional workload.

(2) With the intensification of market competition, the level of informatization in construction units is also increasing year by year. More and more construction units are turning their attention to informatization, and some high-level or large-scale units have even established local area networks to achieve internal data resource sharing. At the same time, some engineering management software has also become one of the focuses of construction units.

(3) In economically developed areas, due to the influence of abundant information sources, construction project managers have a deeper understanding of information management, while those located in economically underdeveloped or remote areas have a relatively weak understanding of information technology. From an industry perspective, the foundation for promoting and applying informatization in municipal construction projects is superior to that of highway construction projects, while railway construction projects have the poorest promotion and application of informatization. In short, there is still a regional imbalance in the information management of construction projects.

(4) Compared with famous foreign software, domestic engineering management software is still in an immature state and there is a certain gap. However, foreign software may not necessarily be suitable for domestic units, especially due to the different organizational structures of domestic and foreign units, so the scope of software application varies accordingly. However, Chinese software only translates foreign languages into Chinese, and there are still difficulties in effective

maintenance. In addition, most of these foreign software are expensive, which is difficult for general construction units to accept [2].

4. Development Strategy of Civil Engineering Information Management

4.1. Continuously innovating and strengthening communication and reference

The informatization construction of civil engineering cannot be separated from developed computer network technology and information communication technology. With the rapid development of the economy and the continuous progress of science and technology, there is great development space for networks and information technology, and huge progress has been made in China, especially in the construction of network infrastructure. Network communication has basically covered the whole country. At the same time, with the development and progress of the times, China has also accumulated rich experience in network operation, and related technology companies in China have also received great development opportunities. A group of high-tech network software companies have grown, providing effective technical support for the informatization construction of civil engineering in China and bringing great impetus in this era. However, in addition to these necessary information technologies, civil engineering information builders also need to actively accumulate experience, identify shortcomings, and solve them in a timely manner in specific implementation projects. They cannot be satisfied with the existing achievements, and must continuously innovate and improve. For their own shortcomings, they must pay attention to them, actively learn from advanced foreign construction experience, and strengthen communication and cooperation. Based on the actual construction of civil engineering informatization in China, continuously develop civil engineering informatization with its own personality and most suitable for oneself.

4.2. Correct understanding

Understand the importance of disciplines driving industries and promote the construction of civil information disciplines. Firstly, civil engineering informatization is a major industry that is related to the national economy and people's livelihood. Currently, civil engineering is still a pillar industry of China's national economy, and it must be comprehensively promoted from scientific research, talent, system, education and training aspects. Discipline construction is the best way to achieve this goal. Secondly, disciplinary construction can effectively integrate social resources, systematically propose and solve problems in the field of civil engineering informatization, and provide momentum for its sustainable development.

4.3. Actively transform work concepts and establish correct information technology awareness

The informatization construction of civil engineering is a historical inevitability of the development of the times. Whether it is civil engineering enterprises or specific practitioners of civil engineering informatization, they must

clearly recognize the importance of civil engineering informatization construction, strengthen attention, actively change their work concepts, establish a correct awareness of informatization, and build a framework and platform for informatization. We need to have a long-term perspective, break traditional concepts, and drive the continuous change and innovation of the entire civil engineering industry. The informatization of civil engineering is an important way for the continuous development and progress of the construction industry. Therefore, only by effectively grasping the trend of civil engineering informatization construction and having its own unique advantages in informatization can civil engineering enterprises continuously enhance their market competitiveness and develop steadily and sustainably.

4.4. Vigorously developing civil information technology

Information technology is the integration of various technologies such as computers, communication, control, and information processing. Through the application of information technology, architectural designers can more intuitively present the structure and form of buildings. At the same time, it is more convenient to design and regulate the building structure, fully unleash one's imagination and creativity, and improve the level of creative achievements. At present, with the help of advanced design software, three-dimensional visual effects of industrial projects can be achieved, and the establishment of solid models facilitates the design work of architects. In addition, visualized 3D industrial models also facilitate the verification of design results [6].

4.5. Integrate social forces and allocate social resources reasonably

Promote the formation of the new industry of civil engineering informatization in terms of policies and systems. The principles proposed by the state are "overall planning, national leadership, unified standards, joint construction, interconnectivity, and resource sharing", and the same applies to the informationization construction of civil engineering. To ensure the smooth progress of civil engineering informatization work, it is necessary to fully mobilize the enthusiasm of government departments, various professional committees of civil engineering, civil engineering enterprises and other relevant parties, adopt a strategy of combining industry, education, research, and politics, actively carry out international economic and technological cooperation, and form a strong and sound promotion mechanism in policy and

system.

5. Conclusion

In short, with the development of the times and the progress of technology, information technology has penetrated into all aspects of people's lives, profoundly affecting and changing people's production and lifestyle. The application of information technology in the field of civil engineering construction has facilitated the design and implementation of construction projects, and improved the efficiency and quality of project construction. In order to promote the informatization construction of civil engineering, the first step is to continuously innovate, transform work concepts, vigorously develop information technology, and integrate social resources. We should actively build an information platform for civil engineering design and construction, thereby promoting the continuous development and progress of civil engineering construction.

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