Research on the Project Management of BIM Technology Based on “Internet +”

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Abstract: The new data system guided by BIM technology and based on cloud computing big data is becoming a new trend and new normal in the future development of the construction industry. The key to improving the level of project management, reducing the consumption of project resources and enhancing the core competitiveness of enterprises is to build a sense of project management based on “Internet +” thinking. Based on the author's learning and practical experience, this work first analyzed the present situation of BIM technology in the era of “Internet +”, then put forward the countermeasures for the project management of BIM technology based on “Internet +”, and finally summarized the development trend of BIM under the background of “Internet +”.

1. Introduction

Construction management of constructional engineering is a complex system engineering. Strengthening construction management is of practical significance to enhancing the competitive advantage of enterprises in the construction industry. At present, there are some problems existing in the construction management of constructional engineering in China, such as waste of resources consumption, difficulties in scheduling and cost controlling, defects in project quality and untimely coordination among all parties [1]. As a result, the construction quality and safety are difficult to be effectively guaranteed, and the construction cost management of enterprises is difficult to effectively controlled. The comprehensive factors above will affect the overall development level of the enterprises [2]. With the increasing recognition of more and more experts in China, the application of BIM technology based on “Internet +” in construction management of constructional projects and the establishment of construction management mode with “modern information network and BIM” has a more profound impact.

2. Development Status of BIM Technology

BIM technology was introduced into China's construction industry in 2003. After years of development, it has been applied more and more widely in China's construction field. Government, research institutes and construction companies are all vigorously promoting the development of BIM technology. However, at present, domestic BIM technology is still not mature enough. The application field is still based on design, and it is very difficult to explore the value of BIM. How to use BIM technology based on “Internet +” to create new business formats and new business models, thus forming a stronger productivity has become a major issue and problem [3]. However, the enthusiasm of construction enterprises to pursue information reform has not been affected at all, so using information technology to improve the core competitiveness of enterprises is still the key to the future development of enterprises. Nowadays, the construction industry is facing a critical period of reform, and BIM has quickly become a new hot spots of constructional innovation with its unique technological advantages. It is gradually transforming the project management methods and operation means of traditional construction industry, and the exploration of BIM technology based on “Internet +” has gained initial experience.

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3. Project Management Countermeasures of BIM Technology Based on “Internet +”

3.1 Information exchange

In the information management process of BIM's construction project, each participant adopts different information management systems. With the advancement of construction projects and the increasing amount of information data, the time aging correlation within information will become the biggest problem. In the database, through establishing the building side data Table, the design side data Table, the construction side data Table, the material side data Table and the supervisor side data Table, each side can store respective information in real time and can intensify and summarize different information data from various participants, as shown in Fig.1. When each side establishes, modifies and updates the information, the views and documents associated with the BIM model are automatically updated to maintain the consistency of the information data [4]. In addition, they set the information reminder function and promptly feed back to other participants, so as to quickly transfer information and communicate, realize synchronous operation with multiple sides, and realize information effective transmission and real-time management control through BIM platform based on “Internet +”.

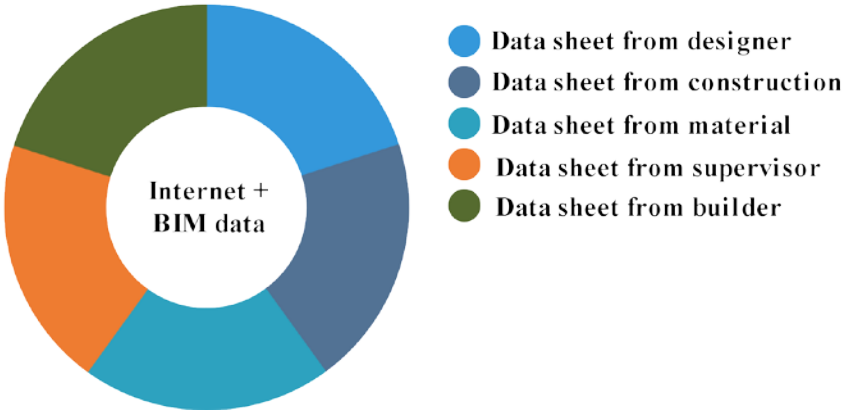

Fig.1 Real-time information transmission mode

3.2 Coordination of all participants

According to the project management model of BIM technology based on “Internet +”, all participants work together on the database platform. Under the traditional management mode, each participant needs to carry out design, construction and other adjustments, or submits, approves and uses various documents due to changes in actual construction conditions in written or oral form. However, through the “Internet +” method, all participants of the BIM system can form an interconnection mode, and they can work according to their needs based on predefined authority, thus forming an independent and mutually coordinated working mode. The “Internet + BIM” database system can develop coordination and modification functions and synergy functions. If any participant needs to change, extract and use data, it can operate through the database platform, thus forming collaborative work among all participants [5]. At the same time, through the “Internet + BIM” platform, it can form a paperless office model, in which project managers can use the “Internet + BIM” system platform function to complete electronic document signature, annotation, review and other work. In this way, not only the shortcoming of the delayed information exchange among parties can be avoided, but also the work efficiency of all parties can be improved, so as to save a large amount of resources and provide guarantee for the smooth progress of the follow-up projects.

3.3 Data sharing

“Internet + BIM” is a data database that integrates various information from each participant, and at the same time, it carries out network transmission in the form of files. All parties involved have the permission to use the database and have their own permission to enter, modify, update, or delete

data. For example, the design side has the right to read, write, modify, delete, and extract the data Table, but does not have the authority to write, modify, or delete other professional data Tables [6]. Therefore, it finally realizes the access, call, and sharing of data among all parties, so as to meet the data storage and use requirements of different construction projects and different professions. On the “Internet + BIM” data platform, providing Internet-based data sharing mode and achieving access requirements in different distances can store data, manage data and exchange data. Attributes of viewing project construction components and buildings not only avoid inputting same information in different software, but also reduce the problem of personnel operation errors, thus ensuring the accuracy, consistency and timeliness of data, and achieving the effect of data sharing and valid data acquisition of all parties involved.

4. The Development Trend of BIM Under the Background of “Internet +”

The BIM technology is a new technology for project management with the popularization of information technology such as big data and cloud computing in the Internet era. It can be used in all stages of engineering projects to provide collaborative work platform for various departments. Due to the significant advantages of BIM technology, the low efficiency of the traditional construction industry can be greatly improved, so it is rapidly spreading [7]. In recent years, the government is also striving to promote the application of BIM technology in China. On the one hand, it keeps up with the international development trend and continuously collects foreign advanced experience; on the other hand, it actively cooperates with the domestic engineering industry, and introduces BIM for application and research in the project construction, thus accumulating valuable BIM experience and systematic establishment of knowledge. What is more, it also continuously promotes the popularization of BIM by holding BIM exchange forums, which fully shows that the government has realized the reform of future construction industry brought by BIM and pas attention to BIM technology. In the future development, BIM technology will have the following development trends:

First, data collection helps decision making. Monitors and sensors can be installed in the building, and the temperature, air and humidity will be monitored through the wireless sensor network. Combined with ventilation, heat supply and water supply situation, the engineer can have a comprehensive and intuitive understanding, which will provide an effective scientific basis for further improvement and refinement of design and construction plans.

Second, the maturity and popularity of cloud computing technology. Information such as cost, structural analysis and energy consumption needs to be processed and analyzed by cloud computing technology. When the technology develops to a certain degree, it can achieve simultaneous calculations in the modeling and analysis process, so that designers can quickly select the best design and solution.

Third, digital reality capture. For bridges, railways, ports and roads, their early data can be determined by laser scanning. Such technology can create visualizations for customers. It is conceivable that future designers can work in an immersive and interactive way similar to VR technology in a 3D space, and they can simply and intuitively display product development.

Fourth, collaborative project management. As a full life cycle model, BIM provides a full visual collaborative design platform, which strengthens the cooperation among designers, owners and construction companies, and they can share ideas to improve construction efficiency. The sharing of BIM technology has enabled project stakeholders to achieve win-win results [8]. In the era of green low-cost and environmental protection concepts being more and more valued, BIM technology based on “Internet +” can make designers pay more attention to whether the whole construction stage of the project meets the requirements of energy conservation and efficiency, so as to realize greater value in the whole field.

5. Summary

BIM technology based on “Internet +” integrates the Internet into the field of traditional

construction engineering. Using modern information network technology and establishing a project management model based on BIM application can improve the production efficiency of the project, improve the quality of the construction project, shorten the construction period and reduce the cost. The comprehensive application of the two will bring great changes to the construction engineering industry. The construction industry of China is in the most critical period of transformation and development, and the green environmental protection will become the theme of the new era. The BIM model based on “Internet +” has begun to become the latest engine for the transformation and upgrading of the construction industry, carrying the new mission of green environmental protection and energy saving. Under the tide of architectural industrialization, BIM, as an advanced management tool, will be widely used by enterprises. Even if it will face great obstacles, BIM technology based on “Internet” will promote the development of green buildings and the realization of construction industrialization.

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