Research on the Application of Bim Technology in Building Engineering Construction

Long Han, Hui Liang

Binzhou Polytechnic, Binzhou, China

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Abstract: BIM technology can play a huge role in the construction of construction projects, with diversified advantages and unique characteristics. By collecting data and information and establishing models, it can provide a strong basis for making various decisions and realize efficient and convenient operation. This article will introduce the concept of BIM technology and its application value in construction, and then conduct research on its application in construction engineering.

1. Introduction

With the continuous development of society, various industries in China have higher and higher requirements for the construction of construction projects. Therefore, a series of advanced technologies should be applied in the construction of construction projects to break the limitations of traditional technologies on construction projects and ensure the construction speed of construction projects. In addition, the quality has been further improved. The application of BIM technology in construction engineering can not only provide construction personnel with three-dimensional spatial structure diagrams, but also dispatch unreasonable areas in the construction plan of the construction project, and promote the smooth development of the construction project [1].

2. Analyze the Characteristics of Bim Technology

2.1 Visualization

The visualization of BIM technology is mainly manifested in two aspects. First, the information structure of the construction project constructed by BIM technology is transparent and the visibility is very prominent [1]. The design and construction personnel can fully consider the project through the transparent structure. There are various problems in the design to avoid accidents or problems in the actual construction process. Secondly, BIM technology can present the construction renderings of the construction project in front of the designers and construction staff, instead of relying on imagination [2]. The previous construction drawings were two-dimensional, and many building structure information could not be directly fed back. The application of BIM technology has overcome this point well, it can enhance the interaction between the design and construction personnel, and better reflect the structural status of the construction project.

2.2 Coordination

The application of BIM technology also provides a means for the design unit and the construction unit to coordinate with each other, which helps to better solve the problems existing in the construction engineering design and construction process. If problems are encountered in the construction management process, the design and construction unit can organize technical personnel to analyse and solve the problems in a timely manner based on the data information resources provided by the BIM technology [2]. At the same time, BIM technology can simulate the effects of many solutions developed by designers, so that the most scientific and accurate judgments can be made to help designers make the best decisions. Before BIM applied technology, in the same

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situation, designers could only discuss solutions for two-dimensional drawings. In this process, different professional fields will inevitably lead to obstacles and frictions, which hinder the smooth progress of communication and coordination.

2.3 Simulation

Simulation is the main advantage of BIM technology application and has outstanding advantages in construction management. BIM technology can not only simulate the shape of a construction project according to various design parameters, but also accurately simulate its internal structure, and can simulate a building structure model, and adjust it according to the design requirements of the designer to help design [3]. The department effectively completed the design work of the construction project. Before the simulation, the designer needs to collect the design parameters of the construction project, and then use computer software to use BIM technology to present the shape of the building structure, and then perform subsequent optimization and improvement until the best design has formed a program.

3. The Application Value of Bim Technology in Building Construction

3.1 Three-Dimensional Rendering, Publicity Display

This technology can provide a realistic image. According to the design plan, it is very specific and true to improve the installation and distribution of the site and large-scale equipment, the construction plan of some special links, the overall construction process selection, and the selection of multiple analysis and comparison of construction plans, etc. [3]. The BIM model can also become the model for secondary rendering development, greatly enhancing the quality and effect of 3D rendering, and can give users a more vivid description of publicity and increase awareness.

3.2 Fast Calculation, Greatly Improving Accuracy

The BIM can realize accurate calculations, which greatly improves the budget efficiency and accuracy of the pre-construction design link. Because the BIM information database has reached the component level, it can quickly realize the data calculation required by various major project management, which also greatly improves work efficiency [3]. Use the BIM model for material analysis, data statistics, cost management, etc., to provide units with a more specific and reliable cost budget basis during the bidding process.

3.3 Accurate Planning to Reduce Waste

The main factor that construction units cannot really carry out refined management is the inability to accurately and effectively obtain data in a large number of databases to help construction design, resulting in excessive reliance on experience [3]. However, the application of BIM can enable relevant staff to accurately obtain engineering data in a short time, provide a solid data guarantee for the entire construction process, and greatly reduce the excessive consumption of various resources, and ultimately is used to implement quotas and budget control. Provide strong technical support.

3.4 Virtual Construction

Combining three-dimensional visualization with the dimension can simulate construction operations. In this way, the entire construction plan and the specific construction schedule is compared intuitively and unrestricted [2]. In addition, collaborative work is required, so that no matter the construction party, the supervisor or some senior management personnel can understand the problems and the progress of the entire construction project have a comprehensive understanding. The use of BIM technology and construction planning, three-dimensional simulation and real-time monitoring and other elements can effectively reduce the quality incidence and rework costs [1].

4. The Bim Technology Application in Building Construction

4.1 The Bim Technology Application in the Construction Plan Layout

In the past, if the graphic design was not fully considered, it would cause many problems during the construction process, and the construction progress could not be completed normally. If you change the plan again, you will need to consume huge financial resources and even more precious time. Increasing work resistance invisibly, making the construction time longer, and seriously threatening the quality of the construction project [4]. The usage of BIM technology can realize the visual supervision and management of the entire project through three-dimensional model building when designing drawings. During building construction, if an emergency occurs, BIM technology can use its own advantages for internal coordination, and the data model will be automatically adjusted based on real-time feedback. The operation is simple and convenient, and it will not affect the development of building construction [4]. The impact is shown in Figure 1. Through the rational use of BIM technology, different construction plans is comprehensively summarized and a most suitable construction plan is calculated.

Fig.1 The Application of Bim Technology in the Construction Plan Layout

4.2 Application of Bim Technology in Construction Inspection Work

BIM technology related operators could create building models, building structural models and electromechanical models with the help of related technologies. Operators can apply related models to inspection software and apply this technology. Simulate inspections of construction conditions of construction projects [5]. In this way, problems existing in the construction design of construction projects are discovered in time, errors are corrected, and problems are corrected in time. This application can avoid rework in construction, reduce resource waste, and achieve optimized configuration of construction resources [5]. Not only that, the BIM technology application in building construction monitoring will also help strengthen the monitoring of all aspects of building construction, help achieve comprehensive inspections in building construction, and ensure the quality of the project.

4.3 Progress Control

In the process of in-depth research on BIM technology, I learned that this technology has many advantages. Not only can an accurate building space model be constructed, but also a query table for construction data information can be built with the support of the building space model to avoid the loss of various data and information during construction, as shown in Figure 2. In addition, there are many factors that need to be considered during the construction of a construction project, which virtually increases the possibility of problems during the construction of the construction project, which also has a great impact on the construction progress of the construction project [6]. With the support of BIM technology, relevant personnel can be required to carry out corresponding construction in accordance with the building space model, control the loss of data and information during construction, and optimize construction procedures. Affected by the BIM construction model of construction engineering, the traditional construction project can no longer meet the modern development needs of the construction industry [6]. This requires the use of BIM technology to adjust the structure of the construction system of the construction project, retain the actual progress of the construction project, and fully respond to the requirements of the previous construction project construction plan.

Fig.2 Bim Progress Control Tool

4.4 Bim Technology is Used in Construction Drawings and Document Management

For engineering project management, the effective management of relevant drawings and documents is realized by means of the drawing collaboration platform of BIM technology. Different professional models can use BIM technology to integrate information to achieve multi-disciplinary integration. With the help of BIM technology, the design drawings of different majors is further deepened based on the work needs, and the drawing information is changed in time [7]. Make reasonable adjustments to contracts, documents and other information, and effectively link relevant documents and information with professional model construction, so that relevant personnel can dynamically consult and apply different documents in the construction phase. In addition, with the help of related browsers and mobile devices, relevant personnel can browse the engineering model at any time, combine relevant drawing information, and conduct effective communication. In this way, relevant personnel can conduct on-site office work, and can timely consult relevant drawings and files. Approval and marking improve office efficiency [7]. At the same time, the application of BIM technology also provides strong technical support for cross-professional collaborative office.

4.5 Application of Bim Technology in Resource and Cost Management

Resource and cost management is an important part of project management. With the help of BIM technology, effective cost and resource control is achieved, effectively saving cost input. With the help of BIM technology, the relevant personnel can effectively integrate the project schedule information and cost information with the three-dimensional model information, so that a 5D building information model is established [8]. Through the 5D building information model, it is possible to effectively calculate the construction resource requirements during the construction phase, and to realize the simulation and optimization of the construction resource requirements. The relevant personnel can use BIM technology to formulate reasonable and scientific labour, materials and equipment Resource demand planning to promote the optimal development of cost resource management. In the construction phase, it is necessary to apply automatic periodic calculation and statistics of actual construction support, and timely statistics of actual input costs, timely collection and analysis, and then comparative analysis of relevant results with budgeted costs, contract revenue and other relevant information [8]. In this way, the over-value and profit and loss of the project is effectively grasped. In the relevant work process, BIM technology is used to optimize the work. With the help of BIM technology to find out the reasons for the over-value cost, then the relevant managers can adopt a targeted cost control method to control and manage the cost, which is great for saving resource and cost saving is a great promotion [8].

5. Summary

The BIM technology application in construction engineering has a positive and significant role in improving the level of construction technology and promoting the modernization and informatization of the construction industry. At present, my country's BIM technology is in its infancy. To truly

realize building informatization and play a positive role in value, relevant technical personnel need to have a good grasp of professional knowledge, actively explore the application of BIM technology, and continuously improve my country's construction the level of development of the industry.

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