

Characteristics and Application Analysis of Building Design Based on Parametric BIM

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Abstract: *With the rapid development of social economy, people's living standards are gradually improved, and there are higher requirements for architectural design. In this context, architectural designers should change the traditional design concept, comply with the development of the times, and apply parametric bim technology to architectural design. This paper mainly analyzes the characteristics of bim technology based on parameterization, and discusses its application in architectural design for reference.*

Keywords: *Parameterization, BIM, Architectural design*

The application of BIM Technology in architectural design can effectively improve the level of architectural design and is conducive to the optimal allocation of architectural resources. Therefore, architectural designers should master the characteristics of architectural design based on parameter BIM, and strengthen the application of BIM Technology in architectural design, so as to improve the quality of architectural design. Through the application of BIM Technology, we can deeply optimize the architectural design, ensure its rationality and economy, and promote the long-term development of China's construction industry.

1. Characteristics of 1Bim Technology

1.1 Authenticity

BIM Technology has the characteristics of authenticity. Through this technology, a three-dimensional model is established to truly show the actual situation of the building, so that people can intuitively see the shape and internal structure of the building, so as to clarify the specific content of the building and have a clearer understanding of its internal elements. At the same time, architectural designers can obtain information related to architecture through the model, such as the price and performance of building materials, construction progress, construction quality, etc., so as to provide reference basis for design management and decision-making of construction engineering. The application of BIM Technology has changed the situation of displaying the scheme design through traditional paper patterns. Through the application of BIM Technology, the architectural design scheme can be completely displayed to people. It can not only make the designer more rigorous in the architectural design, but also effectively reflect the actual situation of architectural design, and coordinate various elements inside the building through three-dimensional images.

1.2 Coordination

In the traditional architectural design process, designers usually carry out engineering design for a certain link, which inevitably leads to professional conflict, such as the problem between architectural structure and pipeline design, so that major changes must be made in the actual construction process to ensure the smooth implementation of the project. The application of BIM Technology can coordinate conflict problems and optimize design schemes. For example, when the architectural designer conducts field survey, he can use BIM Technology to manage the on-site pipeline and simulate the pipeline collision test, so as to find the deficiencies in the design in time, correct them in time, minimize the unreasonable design and other problems, and lay a good foundation for the actual construction of subsequent projects.

1.3 Simulation

BIM Technology can simulate various situations and emergencies that will occur in architectural design engineering. For example, the traditional architectural design can not simulate the earthquake resistance and wind resistance of buildings, and can not determine whether the architectural design can meet the requirements. The application of BIM Technology can well solve this problem by designing relevant parameters, continuously optimizing and adjusting the simulation exercise process, observing the actual impact through parameter adjustment, improving the scientificity, and helping architectural designers choose the best design scheme.

2. Application of 2Bim Technology in Architectural Design

2.1 Modeling Design

With the rapid development of China's construction industry in recent years, the application of BIM Technology can show the architectural design to people in the form of modeling and present the actual data resources inside the building. Through this technology, the staff can fully understand the whole construction process, and conduct reasonable scientific analysis according to the actual situation of the construction project and combined with this technology to ensure safety Reasonable construction to improve project quality [1]. Firstly, the application of BIM can timely find the problems existing in the internal structure of the building in the architectural design, and take corresponding measures to deal with them effectively, so as to improve the architectural design level, improve the project quality, comprehensively grasp the key points of work and ensure the smooth construction of subsequent projects; Secondly, BIM Technology is applied in the bidding process, the bidding scheme is carefully analyzed, and the best scheme is selected to reduce cost consumption and improve economic benefits; Finally, the effective application of BIM Technology can improve the residential structure. By simulating the actual construction process of architectural design, combined with the collected parameter information, find the existing problems in time, take corresponding measures, formulate solutions and deal with the existing problems in time. To sum up, the application of BIM Technology can not only improve the overall environmental design effect, but also scientifically allocate building resources, improve the design level and create a high-quality living environment for people.

2.2 Coordination of Building Structures

Architectural designers can use BIM Technology to establish three-dimensional models and reasonably add or process architectural information, so as to fully ensure the construction quality. At the same time, it should be noted that the three-dimensional models established for different building construction contents will also have obvious differences [2]. Therefore, in order to express more accurate architectural information, architectural designers can insert accurate data information into the 3D model and add the auxiliary description function of the 3D model. The database can also be processed in a scientific way, so that the designer can fully grasp the data information, effectively communicate with the technicians in combination with the data information, and coordinate the construction process with the technicians, so as to achieve the perfect construction effect. During 3D modeling, the designer can select the corresponding modeling software according to the actual needs. It should have the main functions of establishing models, generating drawings and analyzing and simulating, such as Revit software. This software is like a database, which can organically combine the internal structure of buildings and the relevant contents of architectural engineering, Architectural designers can choose the desired model for free design from this software, update relevant data according to actual needs, and share architectural design information in real time, which has strong practicability.

2.3 Control Construction Risks

For construction engineering, it is a continuous process, in which many factors will change, resulting in an impact on the overall project. If the impact cannot be effectively managed and controlled, it will cause risks to the project. Therefore, relevant personnel should take effective measures to do a good job in risk management and control of factors that will have adverse effects. Through the application of BIM Technology, the risks that will occur in the actual construction process of the project can be managed and controlled. The BIM Technology is used to establish a three-dimensional

model to simulate the relevant factors in architectural design. The software system recalculates and models the changes of the building, and gives a new architectural model. This method can efficiently and accurately help designers find out the potential risks and master their existing effects. At the same time, help designers master the anti risk ability of architectural design scheme, and give targeted solutions.

2.4 Project Cost Control

Although BIM Technology is usually used in the design stage of architecture, it can also be used as a tool for project cost control. The basic model is established through BIM Technology, and the corresponding data information is obtained according to the building model. Through detailed analysis, an accurate cost control scheme can be planned. In addition, when using BIM Technology for architectural engineering design, the construction cost and profit can be analyzed through the design scheme. This method can not only improve the design level, but also find the best construction scheme in economic control.

2.5 Simplified Construction Project

For the environment with complex geological conditions, the effective application of BIM Technology can play the greatest role. Through BIM Technology, collect and integrate the corresponding data information for complex building types, verify the specific content of the data information, and design multi-dimensional curves. Architectural designers should give full play to their creativity, show their ideas, intuitively observe the effect of architectural design, constantly improve the effect and quality of architectural design and optimize architectural design. In addition, the application of BIM Technology in the design process of construction engineering can effectively simplify the construction projects. This technology will reasonably divide the construction projects with complex structures into separate structural units, establish the corresponding three-dimensional model for each unit, trim the corresponding modules, improve the module content, and reduce the errors in the design work from the source.

2.6 Optimize Fire Performance

At present, with the increase of building floor height and the continuous expansion of building scale, there are some super large building facilities. When designers design this kind of building, if they still use the traditional fire design concept, their fire performance can not meet the fire protection standards stipulated in our country. The application of BIM Technology can optimize the fire performance and formulate a more scientific fire design scheme. The application of this technology can accurately calculate the diffusion time and range of toxic gas, consider the fire resistance of construction materials, reasonably design the evacuation distance, and simulate the evacuation scheme, so as to ensure people's life safety and maintain building safety.

2.7 Design Integrated Pipeline

With the development of China's social economy, the building scale is gradually expanding, and the distribution of its internal pipelines is gradually complicated. Therefore, in the process of architectural design, the comprehensive pipeline should be designed reasonably to prevent pipeline crossing and collision and improve the construction quality. For China's traditional architectural design, we often do not pay attention to the design of pipelines, and usually use the way of human visual inspection for pipeline detection. This detection method is not only single, but also prone to pipeline crossing [3]. The application of BIM Technology can effectively prevent the occurrence of pipeline crossing and collision, and strengthen the detection performance, so that the constructed building pipe network model can be directly observed. The detection system will automatically detect the pipe network design, mark the location of pipeline crossing, optimize the inspection workflow and improve the pipeline design level.

3. Conclusion

BIM architectural design based on parameterization can effectively improve the design level and quality of architectural engineering, and optimize architectural resources. With the development of

society, the wide application of BIM Technology in architectural design can effectively promote the long-term development of China's construction industry and improve social economic benefits.

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