

Computer-Aided Analysis of Engineering Design Planning by Ubiquitous Communication and Building Information Modeling Platform

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Abstract: With the vigorous development of the construction engineering industry, in order to effectively improve the management level of construction engineering design, in recent years, Building Information Modeling (BIM) has been introduced into the field of architectural design and has been gradually promoted. Combined with the case of modular housing design, combining the integrated technical route of design collaboration under the BIM platform, and summarizing the efficient collaboration mode and work characteristics within and between majors. From the two aspects of software application and project management, explore the construction of BIM integrated multi-professional collaborative design process framework. Based on BIM, the computer-aided engineering design and planning platform has been greatly improved, up to 7.6%.

Keywords: Computer Aided Analysis, Engineering Design Planning, Ubiquitous Communication, Building Information Modeling Platform

1. INTRODUCTION

The architectural design management mode not only has a huge impact on improving the technical level of architectural engineering design, but also has a great impact on the investment, progress [1], quality and safety of the entire engineering project. In order to effectively improve the level of architectural design management, the building information model should use three-dimensional digital technology in the process [2], and at the same time combine the information and data models existing in the corresponding construction projects [3]. The application of this technology for architectural engineering design can promote the realization of digitalization of engineering design [4].

Therefore, building information modeling technology is widely used in the construction industry. In recent years, Building Information Modeling (BIM) [5] has been introduced into China. During the "Twelfth Five-Year Plan" period, Building Information Modeling (BIM) [6] has been listed as one of the overall development goals of informatization in the field of architectural design. Based on the building information model technology, this paper briefly discusses the architectural design management mode in the new era. China is at an important stage of urbanization [7] development. While the rapid growth of the national economy has made great achievements, problems such as environmental pollution and energy waste have also caused natural problems [8]. The sustainable development of the ecological environment brings new challenges. In the national "13th Five-Year Plan", green buildings are clearly listed as the key development direction of China's construction industry, and the domestic green building industry is facing a full-scale rise [9].

Due to the maturity and wide application of the technology, the purpose of VR is to experience the scene from the "high" [10], but it often requires a lot of pre-model simplification and the cloud gradually "flies into the homes of ordinary people", which makes us produce a new process to meet the needs of the engine [11]. At the same time, it also needs the idea of a

professional VR development team: whether VR and BIM can be integrated and involved in the whole life cycle of the building [12]. If the model needs to be modified, a lot of adjustment work will be inevitable in different stages, fully understanding the relationship between VR and its application environment, and the information in BIM is often difficult to integrate [13]. For design, the advantages of VR and BIM are used to complement each other. The widespread popularization of information media has pushed computer technology to a new height [14], and there are more and more fields that can use computer technology to solve problems. convenient. For example, in the construction industry, with the advent of BIM technology [15], many problems and deficiencies in the traditional engineering field have been alleviated, controlled and solved. It can be said that BIM is a turning point in the construction industry [16]. The benefits of BIM in project schedule management are mainly divided into two parts: direct benefits and indirect benefits [17].

Among them, the quality of direct benefits is the key factor for BIM technology to be widely used by enterprises, while indirect benefits relate to the long-term benefits of the company's [18] recognition by the society and the public, and the improvement of benefits is related to the size of the company's market competitiveness [19]. Rich information integration management methods. The BIM-based information integration method is usually based on the BIM model. During the whole life cycle of the construction project, each participant or [20] each professional stores the information related to the specialty in the BIM model to support the work of the specialty or Collaborative work with other majors, because the BIM model integrates different multi-dimensional information from various majors [21]. In recent years, with the continuous expansion of the scale of construction projects, the disadvantages of traditional architectural design management have become increasingly prominent [22]. Therefore, in the new period It is very necessary to apply BIM technology and promote BIM technology in architectural design management work. Full-

dimensional modeling is mainly used in virtual engineering, which can help construction units save costs [23].

In the process of use, the construction process parameters and construction influencing factors are mainly connected in series, in which the template reflects the interaction between the construction model and the design model, thus making the construction model more reusable [24].

2. THE PROPOSED METHODOLOGY

2.1 The Ubiquitous Communication and Building Information Modeling

The data reflects that in 2015, the number of national green building design labels experienced a rapid growth. On the other hand, it can be interpreted that most of my country's green buildings are still in the design stage, and the proportion of projects that take the operation and maintenance stage as green building certification is still very small. As a typical interdisciplinary subject, VR has inherent advantages in improving the application effect of BIM, BIM is handy, "like playing a game", which makes design teaching and improving the quality of education and training have inherent advantages. We propose that the process of constructing learning becomes Easy and fun. Build a "BIM+VR teaching application platform_" to further couple the existing BIM model with 2.3Fuzor compatible with various mainstream digital model VR models, and promote it with the support of the Internet.

chnology has pushed architectural design management to a new stage of development. The implementation of BIM technology is not only conducive to the more rational use of information resources, to improve the quality of work of designers, but also to improve the scientific and technological content of architectural design. Computer simulation belongs to a relatively complex Ade display system. The application of the computer can abstract, refine and simplify the corresponding design content to form a system model.

The model operates on an analytical basis, enabling the reproduction of a range of statistical properties in the system. Computer simulation is basically divided into 7 steps, the first step is to study the system, the second step is to collect data, the third step is to establish the corresponding system model, the fourth step is to determine the simulation algorithm, and finally the results are output. Fuzor supports the current mainstream VR equipment designers to immerse themselves in the VR scene. The experience of the space is interactive, dynamic and real-time. They can enter the design at any stage and experience the spatial scale, material texture, etc. Shadow change, ring sound.

2.2 The Antenna Engineering Design

It's far easier to spot design problems and mistakes than sitting in front of a screen watching a 2D design. BIM technology realizes its role through information technology. It collects, stores and processes related data information through visual models. At present, there are many BIM modeling software, because the BIM concept involves a wide range of fields, including architectural The reason for the entire life cycle of objects from planning and design, construction to operation management, so each field has BIM software related to it.

In architectural design management, using BIM technology to count material tables, two-dimensional design drawings can be directly extracted, and the construction material table list can be automatically generated from BIM technology. In this

way, we can use special computer software. In order to meet the development needs of green building operation and maintenance, domestic design units have been actively exploring a design method that conforms to green building operation and maintenance. Many design companies still use the traditional architectural design process in the design process, that is, after the schematic design is completed, the design results are sent to the green consulting team.

The professional team will formulate specific technical solutions according to the specifications and complete the green building design of the project. Such "post-green design" cannot realize the control of the final operation and maintenance delivery effect. Through the comparative analysis and introduction of the two schemes, the practical application of the first method needs to be based on the comprehensive material information contained in the BIM model components. Therefore, it has a strong dependence on the design depth of the model; for the second scheme, the process name information related to the task is pre-defined in the cost library. Task. With the support of the BIM+VR platform, the experience and evaluation of roaming in the city are also higher. "The research is made possible, and the interactive Fuzor environment allows urban design to be presented in a realistic and easy-to-understand way in which images are applied to landscape environment design.

2.3 The Engineering Design Planning of Building Information Modeling Platform

All participants can get a sense of "live" from the perspective of "real people". We directly combine the borrowed scenery elements and people of the garden site in "walking, driving or even flying in the virtual three-dimensional city scene". In the dynamic feeling of urban space on the garden road, the urban space system and the field of construction engineering are observed from different angles, and collaborative design is generally divided into two-dimensional collaborative design and three-dimensional collaborative design. Two-dimensional collaborative design is an external reference of computer-aided drawing software. Based on document-level collaboration, it is a periodic collaboration method based on regular updates of 2D drawings.

FUZor's plant library is also a distinctive highlight, providing super. There are more than 200 different types of tree species, which can turn over 15 years of growth. The optimization of the design and design is realized by considering the safety of the inspection facilities and the barrier-free security. The work set method is a work mode of "work sharing", that is, a real-time collaborative design method using the same BIM data model. In this method, the central file is divided in the form of a working set. The members of the working group synchronize the parallel design of the same BIM model in the server at the local terminal, and synchronize their design content to the central file on the file server in time. At present, our country It is very common that the final settlement of the construction project exceeds the budget cost when the project is completed, so the cost control during the construction process is particularly important.

In the construction process of the project, by tracking the completion of project tasks in real time, on the one hand, the task engineering quantity is extracted or automatically calculated through the model components associated with the task, and on the other hand, the cost database resources matching the task are found, and the percentage of task completion It is multiplied by the task engineering quantity

and the resource unit price. The BIM-based green operation and maintenance reverse design method realizes two innovations. The first is the innovation of working methods, establishing a systematic working method that starts with the end in mind, first considering the goal of green operation and maintenance, and reverse the work in the construction and design stages.

3. CONCLUSIONS

BIM collaborative design is an innovation in architectural collaborative design, but it is still in its infancy and faces many challenges. There are some application problems and technical shortcomings in information, engineering and management. Collaboration also requires a process of mutual acceptance and adaptation. The geometric attribute parameters such as volume, area, length, width, etc. contained in the Revit model lay the foundation for the engineering quantity of the extraction task. According to the material resource information required by the task.

4. REFERENCES

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