Application Value Analysis of BIM Technology in Assembly Building

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Abstract. With the help of BIM Technology, the design, production and construction level of Assembly Building (hereinafter referred to as AB) can be effectively improved, and the production chain from design to operation and maintenance of AB can be more compact and reasonable, which can play a quite active role in the process of realizing energy conservation and emission reduction, reducing pollution and promoting the development and transformation of the construction industry in China. However, in order to achieve a closer combination of BIM Technology and prefabricated building, it is necessary to further run in and improve in practice, which still needs the joint efforts of the practitioners in the construction industry.

Keywords: BIM Technology, Prefabricated Building, Production Management, Application Value

1. Advantages of BIM Technology
Building information model can be used in all aspects of the building, and can build their own model, and in the process of modeling, use several coordinate systems to constrain them, these coordinate systems can be engineering settings, construction and color and so on. In the traditional construction engineering, there is a problem, that is, because several related specialties in the construction engineering work independently in the design, it will lead to information asymmetry, this situation exists in the process of design and construction, which will bring adverse effects. But using BIM Technology, we can solve the problem of data asymmetry [1-2].

2. BIM and prefabricated building
The relationship between BIM and prefabricated building is shown in Figure 1.

Figure 1. The relationship between BIM and prefabricated building
2.1. The connection between industrialization and digital information technology
At present, China's economy is in a three-stage superimposed stage, namely, the growth rate shifting period, the economic adjustment pain period, and the digestion period of early stimulus policies. At the same time, the construction industry is also changing from high-speed growth to medium speed growth, and the slowdown of economic growth forces the transformation of construction industry. Building is no longer just a problem to solve. Green development, ecological protection and energy storage have been integrated into people's demand for buildings [3]. Therefore, the development mode driven by low factor cost is difficult to continue. Technological innovation will be the driving force for the development of the construction industry. The construction industry has gradually begun to change from factor driven, investment driven to innovation driven, in order to improve the quality and efficiency of buildings. It is necessary to re-evaluate and re-integrate the existing architectural design process, production and construction process and operation management process.

2.2. The combination of BIM Technology and prefabricated building
The traditional prefabricated building project construction mode is from the design to the factory manufacturing to the site installation process, but the three stages are separated, this separation of the work process can not be well coordinated, the whole system has many unreasonable places, often design errors are not found until the actual construction and installation, thus the direct impact is design and construction The unnecessary modification caused by the contradiction of construction, including the delay of construction period and waste of resources, will eventually affect the quality of the whole project. With the promotion of BIM concept, digital technology has been effectively introduced into the whole life cycle of prefabricated building engineering, including the process of design, construction, maintenance and demolition of later buildings. BIM Technology realizes the integration of scheme design requirements, manufacturing requirements and installation requirements. We can start to consider the requirements of design, manufacturing, installation and other aspects before the actual construction, to maximize the avoidance of problems found after the start of manufacturing and construction, standardize the design process in advance, and try to eliminate possible problems in advance [4].

2.3. Prefabricated construction is different from traditional industrial construction
At present, the construction industrialization has gone through two stages of development. The first stage has three characteristics: component standardization and patterning; construction mechanization; on-site assembly, division of labor and procedural. With the promotion of information technology, the construction industrialization has entered the second stage. The characteristics of this stage are that in the Internet environment, the cloud adopts big data architecture to realize intelligent decision-making application, and supports the visualization and Simulation of the front-end, which will provide efficient, rich and unsolvable solutions for the construction industrialization. The problems in the first stage, such as the contradiction between the uniqueness of building components and the standardization of industrial production, the contradiction between the separation of architectural design and component manufacturing, and the contradiction between architectural design and construction can be effectively solved in the second stage of construction industrialization [5].

3. Application value in the production of prefabricated parts
In order to ensure the quality of prefabricated components and establish the traceability mechanism of prefabricated building quality department, manufacturers can implant RFID chips containing the geometric dimension, material type, safety location and other information for all kinds of prefabricated components in the production stage of prefabricated components. Through the chip technology, the logistics management of prefabricated components is carried out to improve the storage and transportation efficiency of prefabricated components.

The production of prefabricated parts can be said to be a crucial step in the production cycle of AB, because the level of its treatment will directly determine the smooth results of the subsequent
connection and construction. In order to ensure the timely and accurate guidance information in the production of this part of parts, the relevant production entities can consider obtaining the geometric dimensions of parts and the design coordination of the production plan of parts through BIM model, so as to avoid any sign of delay in the later construction progress.

4. Application of BIM Technology in the operation and maintenance stage of AB

4.1. Improve equipment maintenance level
In the operation and maintenance stage of AB, an effective equipment operation and maintenance system can be established by applying BIM Technology. Through the use of BIM Technology for data management and emergency management functions, in case of fire hazards, firefighters can more accurately locate the location of the fire through the building and equipment information in BIM information management system [6]. At the same time, effective measures can be taken to put out the fire and reduce the damage caused by the fire. At the same time, in the process of maintenance and maintenance, operators can get information from prefabricated components and equipment from the BIM model, so that the efficiency of maintenance can be greatly improved.

4.2. Improve the inventory and site management of prefabricated components
In the production process of prefabricated building components, the classified production and storage of prefabricated components need a lot of manpower and material resources, and prone to errors. Using BIM Technology and RFID technology, by embedding RFID chips containing component information such as installation position and purpose information in the production process of prefabricated components, the storage acceptance personnel can directly read the relevant information of prefabricated components, realize automatic comparison of electronic information, and reduce the deviation and structure of acceptance quantity in the traditional manual acceptance and logistics mode. The occurrence of the problems such as the deviation of the stacking position and the inaccuracy of the ex-warehouse record can obviously save time and cost. In the stage of AB construction, construction personnel use RFID technology to directly transfer out the relevant information of prefabricated components, inspect the installation location of prefabricated components and other necessary items, and improve the quality management level and installation efficiency in the process of prefabricated component installation.

4.3. Building BIM model of prefabricated building
In the process of model design of the project, firstly, the model components are split. According to the design procedure of prefabricated building, the characteristics of engineering structure are fully considered, and the BIM Technology is applied to split the components of the building model of the project, so as to avoid design errors caused by poor communication at various stages. The component split diagram is shown in the figure 2.
5. Conclusion
Although BIM Technology has been applied in the construction industry of our country, it has great positive significance for the development of the construction industry, especially the AB. But because this technology is relatively new, the number of construction industry practitioners who are familiar with this technology is small, resulting in the application scope of BIM Technology is small, and the combination and connection between BIM Technology and prefabricated building is not close enough, which needs to be further improved and improved.

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