

Application of Bim Technology in Project Management and Construction Cost Control

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Abstract: The rapid development of the construction industry is closely related to the progress of China's economy. At this stage, China's economy has begun to shift from high-speed to high-quality. Under the economic development, the construction industry has gradually slowed down its development and began to gradually develop. Explore in high quality. Based on this, this paper focuses on the application of bim technology in the application of bim technology in engineering management and construction cost control, and conducts theoretical analysis and exploration on the development of China's construction industry.

1. Introduction

The construction industry itself is extremely important. Whether it plays a role in the development of the national economy or based on the development of the construction industry, it is demonstrating its importance to the development of the country, and the development of the construction industry in the past. In the process, due to the rapid development of the economy, the industry has developed extremely rapidly. This has led to a lot of quality and management-related content in the industry beginning to be out of line with the industry itself. The quality of construction cannot be consistent with the development speed of the construction industry. In the long run, it is not only not conducive to The development of the industry itself will seriously affect the related economic construction work.

2. Analysis of Related Content of Bim Technology Application

The bim technology is the building information model. It is divided into three stages: design, behavior and delivery. With the bim technology, the design content of the project can be relatively specific when the relevant construction projects are carried out. The form of digital expression, and the resources of this number expressing itself are shared, can clearly make a specific data simulation process for the whole life cycle of the entire construction project, and combined with the construction industry itself, a project needs to be different in the operation process. Industry stakeholders negotiate and analyze, and this information can also be used to insert data and form real-time data updates with bim technology, thus laying a good foundation for subsequent collaborative work[1].

China's application of bim technology has relevant personnel certification qualification examinations, which are mainly divided into junior technicians, intermediate technicians and senior technicians. Correspondingly, it is a variety of strict registration requirements, and the registration requirements of general intermediate technicians and senior technicians. China will set restrictions on work experience, and need to have a higher level qualification to apply for the next level of qualification. Ensure that the relevant technical personnel in the application stage of our bim technology are professionals with professional literacy.

At this stage, both the water conservancy project and the architectural design itself can see the figure of bim technology, but because the learning and application of bim technology in China is relatively late compared with foreign advanced countries, and the technology is not very mature, it is still at In the promotion application stage, this paper analyzes the practical application of bim technology from the perspective of theory, from the aspects of construction engineering quality

management and cost control, and further elaborates the application advantages of bim technology.

3. Specific Applications in Quality Management and Cost Control

The application and development of bim technology in quality management and cost control is based on the application of current bim technology in China's construction field.

3.1 Quality Control

For the work of engineering quality management, its main purpose is to protect the entire construction project through a series of work in engineering quality management, including the safety of the project itself and the environmental protection of building materials selection. In terms of it, it is to help the quality of construction projects meet the standards. In this work, the most important data analysis is used to complete the statistics on the relevant quality work, and then turn it into a quality management process. With the help of bim technology, we can first analyze the feasibility of the project in the early design stage, and combine the work demands between different types of work to make appropriate improvements for conflicting areas, and to make the rationality and safety of the subsequent construction stage. Lay the foundation. In addition, when using bim technology to collect and count relevant data, it is possible to compare data more comprehensively, avoiding the phenomenon of missing data in traditional data analysis, and then complicated project engineering can also be organized into quality. The management work has laid a good foundation.

In the construction phase, the data information of the completed construction project model can be imported into the construction project model road. During the construction process, the quality status comparison can be carried out at any time, and real-time tracking work can be carried out. For the effective management and supervision of the work ability and quality of the construction workers involved in the construction, on the other hand, the management work can be supplemented from the aspects of project schedule and safety protection measures.

Finally, the bim technology is applied to improve the quality of the quality management work after the project is completed and in the acceptance stage. After the project is completed, the completed project data can be established in the form of modeling and compared with the original design data. There is a basic control over quality, and based on the comparison of raw data and completed data, it can effectively reduce the inspection time after the completion of traditional construction projects, deliver the project faster, and promote the further development of the urbanization process[2].

3.2 Cost Control

The bim technology is reflected in the cost control, which is also reflected in the three stages of construction design, construction process and project completion. Among them, in the project design stage, with the help of project design data analysis, it is possible to effectively lock in the raw materials of the market, find the most suitable raw materials for project construction, and then purchase the most cost-effective materials through market price comparison. Or use the simulation method to complete the actual simulation of energy saving, and then optimize the design drawing itself.

In addition, the traditional project construction engineering design stage, due to the lack of clear design drawings between the various departments to negotiate and unify, resulting in conflicts in the construction content between the various departments during the construction process, not only can not complete the required construction content during the construction period It can even lead to engineering rework, and with bim technology, this problem can be visualized at the design stage, allowing all departments to participate in the discussion of the design process, solving the problem at the design stage, effectively avoiding subsequent projects. Unnecessary expenses for construction. Behind the bim technology is a powerful data processing capability. Through the bim database, it can realize the rapid acquisition of engineering basic information at any time, through the consumption of contract, plan and actual construction, unit price, itemized price and other data. More calculations, better grasp the data cost direction of a specific single project, and then

effectively understand whether the project operation is profit or loss, whether the consumption exceeds the standard, whether the purchase unit price is out of control, etc., complete the cost refinement. At the same time of control, effective management and control of project cost risk[3] is realized.

Secondly, in the construction phase of the project, through the simulation of the physical model of bim technology, it is possible to carry out simulation data analysis on the content of the problem during the construction process and obtain accurate conclusions. In addition, content data such as schedule planning and equipment working status can be imported into the model to better control the construction rhythm and complete the project within the specified working period to avoid delaying unnecessary losses caused by the construction period. It is also possible to rationally allocate the personnel configuration of different types of work or the scheduling and use of personnel and equipment in different periods through the content calculated by this data, and better complete the control of the cost content. Finally, in the completion stage, according to the data collection during the construction process, cost verification is effectively carried out, and the cost data from time to space, from the quarter to the monthly cycle, and the cost control work are dynamically completed.

4. Application Advantages and Development Trends of Bim Technology

Combined with the above practical application of quality and cost control of bim technology, the application advantages and development trends of bim technology are further analyzed to provide a theoretical basis for better serving quality management and cost control.

4.1 Application advantage

In the practical application process, bim technology has eight advantages, the most important of which is the characteristics of visualization and coordination. The visualization of this feature is mainly the relative conclusion compared with traditional architectural projects. In the design stage of the traditional architectural project, it is only the work of flattening the work in the form of design drawings. Many participants need to conceive the actual situation in the mind according to the blueprint of the designer, but with the development of the economy, people's material The improvement of living standards, whether based on the pursuit of spiritual culture or the actual pursuit of material life, the requirements for the building itself are getting higher and higher, the construction projects are becoming more and more complex, and it is obviously not scientific to complete the construction by imagination[4]. The application of bim technology can effectively transform the 2D construction design into a three-dimensional physical image, and then display the actual design results, so that the entire design process presents visual characteristics, which is easy to form when communicating with other teams. Simplified, interactive communication.

In terms of coordination, it is based on the visualization of the data model. The relevant staff responsible for the specific construction project can coordinate the problems that may arise in the subsequent projects, such as the layout of the HVAC pipeline in the design drawings. Whether it is reasonable, etc., and then carry out effective interactive adjustments to avoid problems found in the subsequent construction process, resulting in difficult problem handling. In addition, the cost budget of a specific construction project is fixed, and the cost is avoided in each construction period, so the cost can be avoided. If the funds are used in the “blade”, it is also a core issue in the construction project. With the advantage of bim technology coordination, the database can be generated during the construction process, and the construction period is the basic assessment cycle. Various loss data are included in the real-time calculation, and the cost is calculated and correspondingly decomposed to form a powerful data collection. Processing, establish a 5d database, and facilitate post-cost accounting.

Another advantage of the bim technology is its analogy. The analogy referred to here is different from the modeling indicated above. The bim technology can not only simulate the building model, but also add some practical simulation content, such as energy saving. Simulation, sunshine simulation and other simulation content, better optimization of design schemes, or simulation of

evacuation scenarios for emergencies, to facilitate the safety management of the construction site and the practical analysis of project design. Both the simulation itself and the actual application method can better improve the quality management and cost control of the project[5].

In addition, bim technology also has optimization, mappability, integration, parameterization and information completeness. It can 3D rendering of architectural project design content, effectively improve design accuracy through calculation, and avoid some redundant Waste, cooperate with the various participants in the construction process, and facilitate the development of related work of control and decision-making.

4.2 Future prospects

There are actually many cases in the application of bim technology in China's construction industry, such as the Nanjing Youth Olympic Conference Center. The building itself is very complicated. With the bim technology, the detailed simulation from the building model to the bolt position is realized, and the construction is completed on site. Or, as for the repair of ancient buildings, many ancient buildings have a long history, and the data collection process of the building itself is difficult. With the help of bim technology, accurate data collection, maximizing the restoration of the historical building itself, effectively assisting the repair project.

In general, the application range of bim technology is far wider than its existing application range, and the application of bim technology is mainly limited to the domestic application market. The bim technology can effectively realize 3d, 4d, 5d modeling can be used to carry out targeted models and calculations for different architectural projects[6], but on the one hand, China itself started late, and the application analysis of bim technology is not thorough enough, and some small and medium-sized projects are still in transition. At the stage, it has not been fully promoted to bim technology, so the number of users has always been limited. On the other hand, there are not many relevant bim technical professionals in the market in China. Compared with the overall development trend of the construction industry, talents are obviously in short supply, which hinders the practical application of bim technology. In addition, the application of bim technology is an important technology to effectively control the whole life cycle of construction projects. It can bring qualitative changes to the development of the entire construction industry. Its importance cannot be underestimated. It is the construction industry. A typical representative of green technology. Therefore, the development of bim technology is very large, and it needs further application, analysis and exploration, and fully utilize it to contribute to the overall development of China's construction industry.

5. Conclusion

In summary, bim technology itself has a very important auxiliary and impetus for the quality management and cost control of construction projects, not only limited to quality management and cost control itself, but also the advantage of bim technology to rationally apply bim technology. Bring new development forms and directions to the entire construction market. This paper only reflects the content of quality management and cost control from the perspective of theorization. It is hoped that the relevant construction work will continue to analyze in depth and provide more theoretical content with reference value.

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