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# THE APPLICATION OF BIM TECHNOLOGY IN CONSTRUCTION PROJECT MANAGEMENT

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***ABSTRACT***

*BIM technology occupies an important position in the engineering project management of the construction industry, and can effectively solve the shortcomings of the construction unit in terms of schedule, quality and cost in the traditional management mode. With the help of BIM technology, construction units can build corresponding virtual models based on actual conditions, rely on intuitive models to confirm the deficiencies in the design, and accurately control the communication and coordination of schedule, materials, environment, and funds; necessary; It can assist the construction unit to drill the specific construction content in advance to further improve the construction quality; it can also assist the management personnel to realize the rapid summary analysis of the engineering quantity data, and effectively improve the cost management efficiency and quality of the project. The construction industry needs to pay more attention to BIM technology and give full play to the important role of this technology in project schedule, quality and cost management.*

*Keywords: BIM Technology, Schedule Management, Cost Management, Quality Management, Project Management*

## I. Introduction

BIM technology mainly relies on three-dimensional and rarely has its own database to build building-related information models. It is a platform for sorting, collecting and transmitting building data. With the assistance of BIM technology, construction units can quickly establish a platform that can efficiently circulate information resources among multi-department units, effectively avoiding various risks during project management, and improving project management effectiveness. At present, countries all over the world have introduced BIM technology into the process of construction engineering management.

Domestic companies need to pay more attention to this technology and give full play to its role in reduc- ing budgets, improving construction efficiency and quality, and contributing to the sustainable development of the construction industry. Provide assistance.

## II. Problems existing in the progress, quality and cost management of traditional construction projects

In order to improve management efficiency, traditional construction projects often divide the project management content based on the actual content of each unit's participation. Each unit often pays more attention to its own economic benefits. In order to improve the efficiency of project construction, the lack of attention to project quality results in the construction project has quality defects, which is far from the world average.

### Project Progress Management Analysis

Project progress is directly related to the economic benefits of construction units. Construction units attach great importance to schedule management and often take a variety of measures to strictly control the completion of schedules and avoid unnecessary costs due to slow construction. In the 1950s, the construction unit adopted a simple horizontal diagram to arrange the schedule plan, which can realize the efficient deployment of funds, manpower and materials, but it is difficult to rationally express the engineering activities from the logical relationship; in the 1960s, the construction unit Using CPM and PERT two methods can achieve accurate feedback on the logical relationship of the project, clearly express the work content and work sequence that workers need to carry out, and achieve reasonable control of cost and progress and reli- able process supervision, but the intuitiveness is relatively poor. And the difficulty of compilation is relatively high. In the 1980s, construction units used GERT and VERT technologies for schedule management, which can effectively predict various risks, but it is difficult to achieve good application effects in the simulation pro- cess. Analysing the traditional management model combined with the actual situation, it can be found that the traditional schedule management method is difficult to accurately control the conflicts between the design and the actual situation, and the construction schedule is often affected by the later design changes; the schedule plans made by some construction units are often more abstract and There are unreasonable situations. It is often difficult for some construction personnel to improve work efficiency without under- standing the specific work plan; the two-dimensional CAD construction drawings are not intuitive enough, and the construction personnel cannot accurately

understand the design and construction requirements without effective communication. Often affect the construction progress.

**Project Quality Management Analysis**

The goal of quality management is to ensure that the quality of the built building meets the design and standard requirements, and can pass the building acceptance, on this basis, to improve the economic, practicality, safety and beauty of the building as much as possible. In order to ensure that the construction quality meets the requirements, the multi-party units involved in the construction project need to carry out dynamic cycle management of the project in strict accordance with the PCDA theory at each stage, and repair various deviations and defects in time. Analyzing the traditional management model based on the actual situation, it can be found that traditional quality management methods are often difficult to effectively coordinate the work of various professional units, and quality problems are often prone to occur in equipment interfaces and cross-construction. At the same time, the lack of skills, experience, and management of construction, design, and decision-making management personnel in construction projects will also cause the construction quality to fail to meet the require- ments. For example, some construction personnel have low skills and cannot accurately implement various technical standards in the design requirements, resulting in defects in the quality of the building.

**Analysis of Project Cost Management**

The goal of cost management is to establish a scientific and reasonable construction cost expenditure target based on the actual situation of the project and national quality standards, and to control the cost expenditure through various management activities to avoid unnecessary cost losses. Traditional construction project management usually the budget preparation will be the focus of cost management, and the project cost will be determined in combi- nation with the project volume, consumption indicators and price parameters. However, the number of units involved in construction projects is relatively large, and many units often have a differentiated understanding of cost management because of their different interests. For example, the contractor takes the cost specified in the contract as its own cost management objective, while the construction unit focuses on controlling the amount of project investment. There are three main problems in traditional cost management. First of all, the calculation of the engineering quantity by the project participating units often overlaps with other units. In the absence of communication and

coordination, the engineering quantity will be double-calculated, and the determined cost deviates from the actual situation. Secondly, due to the relatively slow update efficiency of the quota standards for labor, equipment, and materials, cost management will be affected to a certain extent when market prices change; at the same time, when problems such as visa claims and design changes occur, the project cost involves The content will change, and the cost management will also be affected. Finally, the quota levels set by the government and enterprises are inconsistent, and enterprises rely solely on the consumption indicators prescribed by the government to determine the project cost often cannot guarantee the accuracy of the results.

## III. Application analysis of BIM technology in the process of construction project management

With the assistance of BIM technology, construction units can establish 4D construction models to achieve reasonable responses to common problems in the traditional schedule management process. In the specific application process, the owner unit needs to collect and send various materials and information to the design unit, and the design unit is required to combine relevant information to establish a three-dimensional model related to each major of construction engineering, and accurately calculate the engineering quantity based on the 3D model. At the same time, the construction unit needs to compile and refine the project schedule according to the schedule requirements and quota standards, clarify the key project nodes, and reasonably control the project schedule. On this basis, the construction unit needs to combine the schedule plan with the 3D model constructed by the design unit to form a 4D construction model, thereby achieving reliable management of the construction site, equipment and facilities, and ensuring that the construction schedule meets the requirements. It can be found by comparison, the modern construction project schedule management work supported by BIM technology can form an intuitive 3D model that can effectively avoid design conflicts. It can detect unreasonable conditions in the schedule in a timely manner and modify it under the virtual construction situation, and can realize the funds and materials Reliable coordination of, personnel and schedule can also make reliable emergency plans for environmental problems. Relatively speaking, BIM technology improves the quality of construction project management and effectively solves many problems in schedule management under the traditional management model.

## Application Analysis of BIM Technology in Construction Project Quality Management

BIM technology can also play an important role in project quality management. It can effectively solve the problems of traditional management methods such as unclear specifications, unreasonable supply of materials and equipment, and inadequate professional coordination, and achieve effective improvement of project management efficiency. In the specific application process, quality management personnel need to clarify the process flow involved in each project, and combine the relevant technical specifications and quality standards to build a BIM technical model. Secondly, project management personnel need to arrange for technical personnel to use BIM technology to output various materials and accessories involved in construction, as well as the quantity and model of equipment and equipment, and to summarize and organize them. Finally, managers need to combine the relevant information and data output by the BIM model to supervise and evaluate the construction quality and the quality of materials and equipment, and timely deal with the unqualified places to effectively improve the construction quality. Through comparison, it can be found that BIM technology can provide Construction project managers formulate reliable and practical construction models. Although it is difficult to solve the problems of personnel skills, they have certain application value in material selection and mechanical deployment, effectively avoiding the situation of unqualified materials and mechanical equipment; at the same time, With the support of BIM technology, construction units can rely on construction models to assist construction personnel in accurately grasping technical specifications and design process requirements, and can predict and analyze the cooperation of various disciplines in construction, interface, and cross-cutting, so as to avoid conflicts affecting the quality of project construction.

## Application Analysis of BIM Technology in Construction Project Cost Management

The purpose of construction units to undertake engineering projects is to obtain economic benefits. In order to avoid unnecessary losses in project investment, cost management occupies an important position in construction project management. BIM technology can play a good auxiliary effect. In the specific application process, construction units need to convert many two-dimensional data such as architectural design drawings and construction

drawings into visualized three-dimensional digital models, and rely on BIM models to fully display the mechanical and electrical involved in construction.

, Structure, building and other aspects of component attribute in- formation, and then assist related professionals to achieve accurate calculation of engineering quantities. After the BIM model is established, the construction unit needs to achieve reasonable control of the cost goal through model optimization. In the process, it needs to fully consider the quota design and the project value related situation, and collect the actual relevant information and data on the spot to avoid later occurrences as much as possible Design changes that affect the project cost. On the one hand, the construction unit can quickly confirm the project cost based on the changed cost and the contract price, and rely on the BIM digital model to reliably supervise the project development as soon as possible to ensure that all expenditures meet the cost target requirements. On the other hand, the construction unit can perform statistical analysis on the payment status of the project according to the cost documents produced by the BIM model, and timely rely on comparative analysis to confirm management abnormalities. In addition, the construction unit needs to establish a data sharing server to realize the sharing of BIM building construction models, ensuring that each unit can review and confirm the data such as engineering quantities in combination with the data information provided by the BIM model, effectively improving the quality of cost management, and for the subsequent similar The project cost management work provides a reference basis. Through comparison, it can be found that BIM technology can help construction units effectively solve the engineering quantity calculation problems in the traditional management mode, reduce the difficulty of cost calculation in the process of engineering data changes, and increase the cost of multi-party units. The effectiveness of communication.

## IV. Conclusion

BIM technology is of positive significance for the current construction quality improvement, cost control and construction schedule management of the current construction industry. Construction units need to strengthen their emphasis on BIM technology, continue to carry out research work on technology applications, and build for construction projects A more reliable and efficient virtual model ensures the smooth and reliable development of project construction. Of course, in the process of applying BIM technology, construction units also need to consider their shortcomings in dealing with

personnel quality defects. While developing technology, they also need to pay attention to the training of construction, design, and management personnel.

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