

# Based on the BIM Technology in Construction Management of Application and Research

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**Keywords:** BIM technology, Construction management, Application, Research

**Abstract:** While the national economy and science and technology are developing at a rapid pace, people's lives have also been greatly changed. Especially in the construction management work, the introduction of new technologies has made the construction management work better. Construction companies should clarify the meaning of BIM technology and introduce it into its own work system to fundamentally improve the efficiency of construction management and ensure its sustainable development. This paper will further explore the application of BIM technology in construction management.

## 1. Research background

In the traditional construction management work, the construction enterprises often use CAD technology to carry out the work, but this method is not only inefficient, but also because it is operated on the plane, it is very easy to produce errors and has strong limitations. In the context of the vigorous development of science and technology, BIM technology emerged as the times require and has been widely used in the civil engineering industry. The technicians use BIM technology to carry out construction management, which can transform the original plane model into a three-dimensional model, thus clarifying all aspects of the building information, which is helpful for the technicians to have a deeper understanding of the building's live situation [1]. Since the model under BIM technology is a three-dimensional model, the data that can be observed by technicians is no longer limited to lines and points, but to architectural elements such as walls and windows. BIM technology has many advantages. Construction companies should clarify their superiority and introduce BIM technology to ensure the quality and efficiency of construction management [2].

## 2. BIM Technology Overview

BIM technology is simply a building information model. In the traditional CAD technology, the technician can only know the shape of the building through the plane, but it is difficult to obtain other important building information, which makes it difficult for the technician to ensure the comprehensiveness of the work when carrying out the construction management work. Construction management is stagnant. In this context, countless scientific and technical personnel have accelerated the innovation of construction management technology and attempted to promote the progress of construction management in this way [3]. The birth of BIM technology has effectively achieved the goal of improving the efficiency of construction management. Technicians have observed the building information model and can learn about the information of the building to help them better work. When constructing an engineering project, the construction company can use BIM technology to integrate the entire construction project, thereby consolidating the informatization model of the body and the dynamic, and the model is constantly changing as the construction progress is accelerating [4]. Managers observe the informatization model and propose corresponding countermeasures to ensure the effectiveness and feasibility of management. The arrival of the information age has undoubtedly injected vitality and vitality into the civil engineering industry. It has made the original single construction management more concrete, greatly improving the efficiency of construction management and providing the development of construction

enterprises.



Figure 1. Principle of BIM technology

### 3. The application status of BIM technology in China

BIM technology has the advantages of high efficiency and precision. Compared with CAD technology, it is more favored by Chinese construction companies. With the continuous development of BIM technology, it has been popularized in China's civil engineering industry, but there are still many shortcomings in the application process, which is caused by the restrictions of the Chinese government [5]. China and foreign countries are completely different. They do not need to be regulated by the government. However, China's construction industry needs to be carried out under the supervision of the government. This has brought restrictions to the development of China's civil engineering industry to a certain extent. In order to make up for the differences in these policies, China's construction market still needs to go through various efforts. In the foreign construction market, construction companies only need to adjust construction management technology according to the needs of the construction market, which makes BIM technology effectively developed and promoted, and Chinese construction companies not only need to consider the needs of the construction market, but also It is necessary to consider the government promoted by the government. Under the constraints of government policies, it is often difficult for Chinese construction companies to promote the application of BIM technology. In addition, because BIM technology is more complicated than CAD technology, and the number of technicians is lacking in China, it also makes it difficult to promote BIM technology [6]. In summary, although BIM technology has many advantages, it is limited by the policies of the Chinese government, and China lacks relevant technical personnel, which makes BIM technology not fully introduced into China's civil engineering industry. In order to ensure that BIM technology can be popularized in China, the government should implement corresponding policies to publicize and support the application of BIM technology in the civil engineering industry. At the same time, the government should also strengthen the training of BIM technicians to ensure that Chinese universities can highly support the training of BIM technicians, and introduce BIM technology-related content in their own teaching

systems. Only in this way can the talent supply of construction enterprises be guaranteed. Thereby promoting the rapid development of the civil engineering industry.

#### 4. The application of BIM technology in construction management

BIM technology can help operators to fully understand the details of construction engineering, and is one of the more effective technologies in current construction management. With the continuous improvement of China's building technology, the value of BIM technology will also rise and become more and more valuable in the civil engineering market.

##### 4.1 BIM technology can improve the effectiveness of cost management

Because BIM technology can help operators to form a clearer understanding of the building information, managers can apply it to the management of engineering cost. The application is embodied in two aspects: First, BIM technology can help managers collect and summarize information about project cost, and managers observe building information models to form a more comprehensive understanding of information and data. At the same time, the building informatization model can also ensure the validity and integrity of the data, which also facilitates the data storage of managers; secondly, the application of BIM technology can also transform the original abstract data into image data, and realize Visualized cost management work [7]. In traditional cost management, technicians can only use lines to outline cost information and manage cost information. This method is inefficient, and BIM technology can convert flat information into three-dimensional information for managers. Seeing data more intuitively has a strong advantage. For example, technicians can use BIM technology to judge the different complements in construction projects and the cost information that appears at the time. With the continuous promotion of BIM technology, its role in engineering cost management is also growing. In order to enable BIM technology to better play its own value, technicians should strengthen their attention and continuously improve their own Professional ability, only in this way can ensure that BIM technology can create economic value for construction companies to the greatest extent [8].

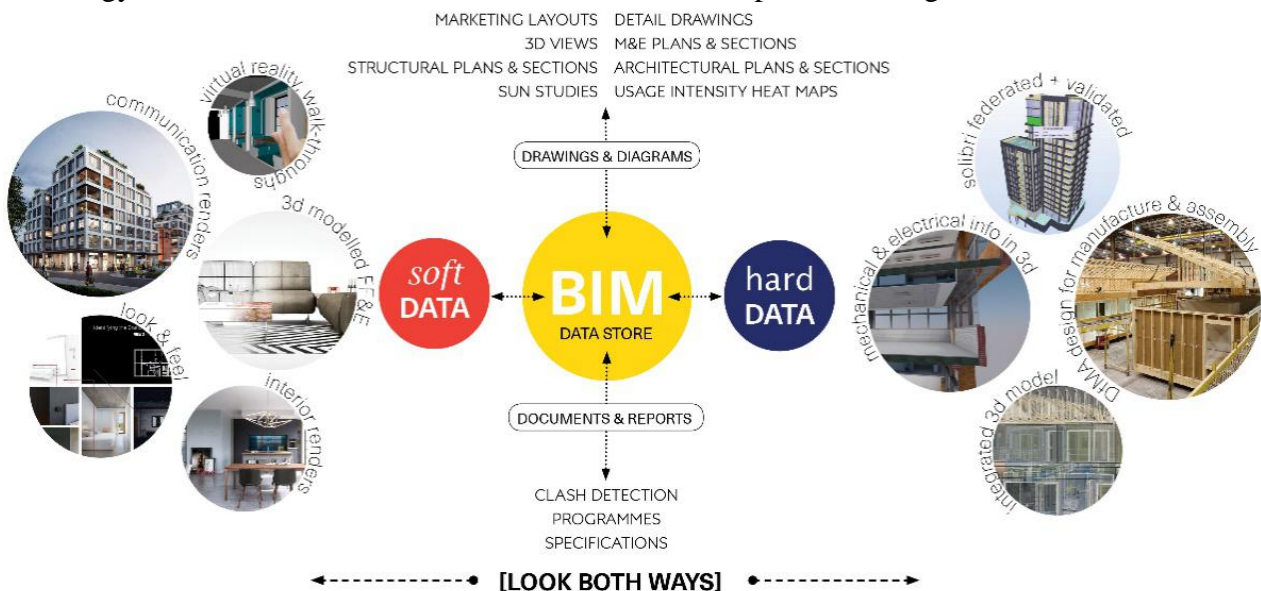


Figure 2. BIM technology service scope

##### 4.2 BIM technology guarantees the safety of engineering construction

Safety hazards have always been the focus of attention of construction companies. In recent years, people's awareness of safety has been continuously improved. Since construction companies have always belonged to high-risk enterprises, they have also received widespread attention. In the traditional construction safety management, managers can only gradually investigate the potential

safety hazards in the construction process, but this work mode is inefficient, it is difficult to ensure the comprehensiveness of the work, some details may be ignored, and then Construction safety has a serious impact. Therefore, managers should pay attention to the application of BIM technology and introduce it into security management [9]. Managers use BIM technology to carry out security management, which can form a clearer understanding of possible security risks in the construction process, and pay attention to some details to ensure the effectiveness and comprehensiveness of the work. In the actual construction process, technicians use BIM technology to locate the staff, and can also form real-time monitoring of the construction, thus ensuring the safety of the construction personnel, reducing the possibility of accidents, fundamentally eliminating safety hazards and ensuring the entire project. Construction safety. In addition, managers can use BIM technology to develop a security management solution and ensure that the solution can be implemented in the actual work.

#### **4.3 BIM technology can help operators to clear the progress of the project**

Since engineering construction is a long-term job, its progress is difficult to express with icons. In order to enable managers to better carry out construction management work, BIM technology should be introduced into the construction enterprise. The technician can apply the BIM technology in the project construction schedule management, so as to grasp the progress of the whole construction as a whole, and provide guarantee for the efficiency and quality of the project construction. Since BIM technology is a three-dimensional model of informationization, staff should make full use of the value of 5D software, and divide the project into blocks, and then compile the network plan, which can effectively guarantee the construction of the model. To put it simply, technicians use BIM technology to add time-related information to the building model, and use advanced technology to develop virtual construction to determine the construction progress of the entire project and to properly regulate it. In addition, the application of BIM technology in project schedule management can also help operators understand the consumption of project funds, and then communicate with supervisors and developers in a timely manner in case of insufficient project funds or other situations to ensure the project. The problems that arise can be resolved in a timely manner.

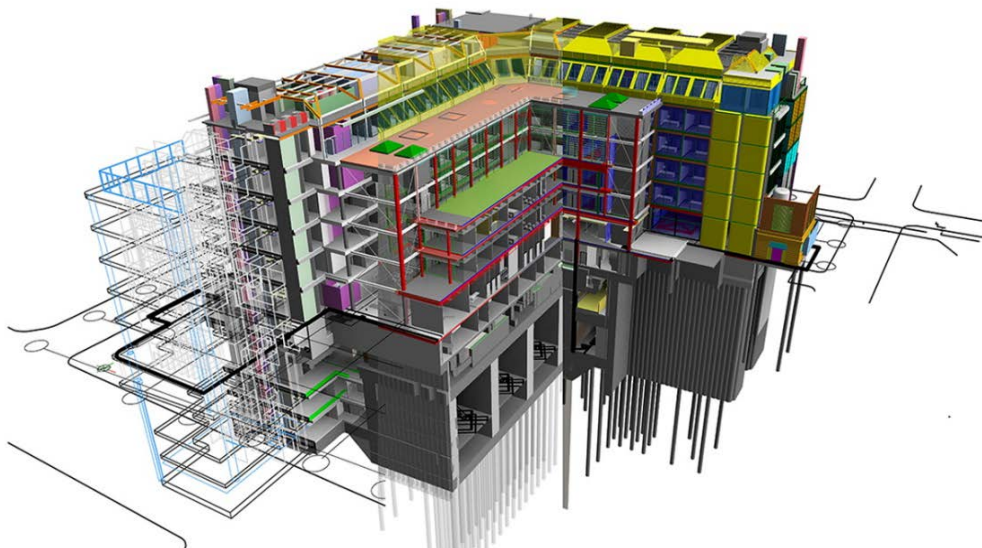


Figure 3. BIM modeling example

#### **4.4 BIM technology can guarantee the quality of engineering**

For the construction company, the quality of the building is a major point. If the building cannot meet the quality requirements, it will have a fatal impact on its development. In the traditional quality management, it is often difficult for managers to carry out quality management work on the project. The work is not only inefficient, but also the level may be lower. The introduction of BIM

technology can effectively change the quality of the construction enterprise. Management status. The management personnel apply BIM technology to project quality management, which can ensure the effectiveness of project construction, and help managers to find out the deviations in the project construction in time, so that managers can carry out treatment measures for deviations and ensure the overall quality of the project construction. There are various factors influencing the quality of the project. Managers should clarify the causes of these factors and then establish corresponding emergency response mechanisms. Only in this way can quality problems be resolved in a timely manner. The factors that constitute the quality of the project include not only subjective factors, but also objective factors. It is mainly affected by the general construction environment and the quality of the construction personnel. The management personnel should introduce the BIM technology into their own work system, and the construction environment and personnel quality. Only in this way can we ensure the effectiveness of construction management and promote the efficient development of construction management.

## 5. Conclusion

In summary, the application of BIM technology in the civil engineering industry can greatly improve engineering efficiency and engineering quality. It is a more effective technology that can help managers to better carry out construction management. Managers should clarify their importance and give full play to the value of BIM technology. Only in this way can the popularization of BIM technology be promoted, so that China's civil engineering industry can be better developed.

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