

# *Research on Construction Quality Process Management Based on BIM Technology*

Geng He

*Zaozhuang Vocational College of Science&Technology, Shandong, China, 277599*

**Keywords:** Construction Quality Process Management; BIM Technology; Information Management

**Abstract:** In the development of social economy, various construction projects are in full swing in the urban construction development. In the information management of construction projects, the most commonly used management mode is the building information model technology. With the help of IBM technology, it can not only effectively improve the level of project quality management, but also realize the sharing of information. This paper mainly introduces the application of BIM technology in construction engineering management, and then analyses the practical application advantages of BIM.

## 1. Introduction

There are many pillars of national economic development, and the construction industry of our country is considered as one kind. The traditional construction industry pays too much attention to the cost of the project, which leads to the low requirement of project quality management. There is a certain gap on the engineering management level between China and the West, but the construction industry has been improving its requirements in this respect. Therefore, in order to ensure the quality of the project, we need to introduce advanced BIM technology. BIM mainly combines all the information involved in housing construction projects. BIM mainly combines all the information involved in housing construction projects. On this basis, we establish a data model for engineering projects. It realizes the simulation of building project information using digital information. The technology can meet the needs of information and integration of construction engineering. In practical application, it has many practical advantages, such as high simulation, coordination and optimization. In the construction management of housing construction projects, the BIM technology can effectively promote the construction enterprise management technology development, and it improve the quality management level of construction enterprises. BIM technology plays an important role in improving the productivity of construction enterprises. Therefore, BIM technology has gained a larger space for development and application, and has become an inevitable choice for the construction enterprises development.

## 2. The construction quality process management model based on BIM technology

The construction quality process management can be divided into pre-quality control, in-process

quality control and post-process quality control according to the stage control. In this paper, BIM technology is applied to the main process of this process, as shown in Figure 1.

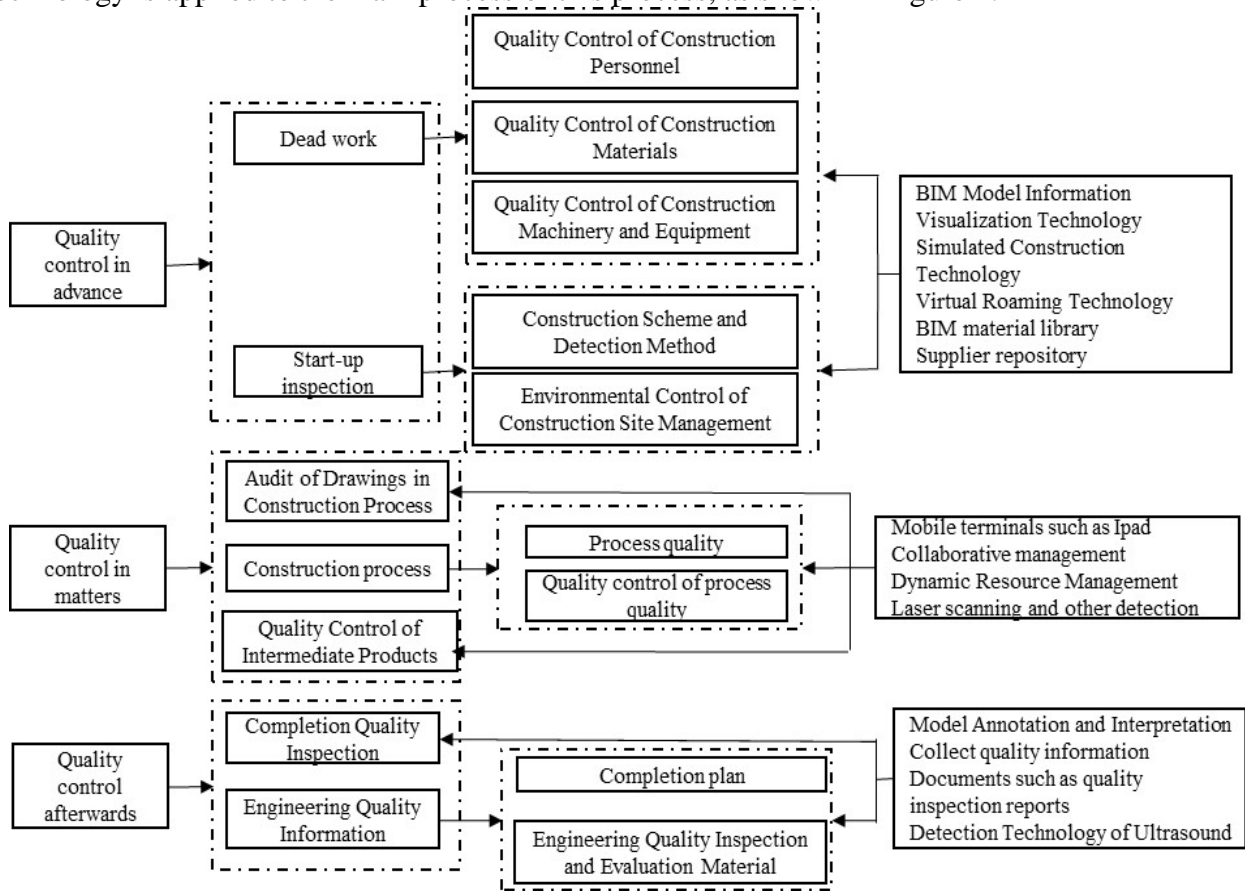


Figure 1: The construction quality process management based on BIM technology

### 3. Quality Management Process Based on BIM and PDCA

#### 3.1 Planning Phase

Traditional design drawings need to be audited many times before construction. Firstly, the internal examination of each specialty. Secondly, the comprehensive review among specialties. The project department needs to organize the contractor to review and submit the revised opinions to the design unit. Finally, the design submission drawings will be reviewed. Only through these three steps can the drawings guide the construction. In this way, technical problems are solved in the early stages of the project. Before the construction, we need to deepen the design of the drawings to form the detailed construction drawings. BIM technology is mainly through the establishment of models to deepen the design and comprehensive optimization, and ultimately formulate the project plans. BIM technology can perform dimensional space collision detection, which will eliminate the conflicts among structures, buildings and electromechanical systems. In this way, we can reduce the cost and time of design changes during construction. BIM technology can also deal with the construction of complex structures and components in advance, which provides a good basis for the smooth implementation of the project. On this basis, adding the time axis, we can make a 4D construction plan and simulation. Therefore, the best construction scheme is chosen to accurately grasp the progress and quality of project construction management. The 4D model can be used as a reference for contractors to make plans, thus saving costs and reaching expected profits.

### 3.2 Implementation Phase

According to the plan, the implementation results should be reported in the BIM project management software every month, and the implementation status of the plan objectives should be tracked. At this stage, we can assist in dealing with relevant issues through the BIM team. If an important implementation plan involves other units or other departments, it can only be implemented after deliberation at the meeting. The quality department holds weekly quality meetings to deal with, track and summarize the quality situation. The project department will track the quality, schedule, cost and other objectives. The project department holds regular meetings on the results of target implementation. Through construction simulation, the node structure of construction is refined in advance to prevent construction based on experience. In this stage, the project schedule and cost, material management information are directly input or updated to the system platform by clicking on the components in BIM. Based on the original construction plan, after analysis and processing, the system forms various quantitative indicators and charts, which enables construction managers to effectively and immediately grasp the construction status.

### 3.3 Inspection phase

On the construction site, the supervisory engineer takes pictures and videos to record quality information after finding quality problems during inspection or acceptance. Through the network, the information model of construction can be imported in real time and described with words. The system notifies and warns the construction managers on site in real time. Quality personnel solve this problem in time through the following four steps. First, clarify the types of problems. Second, analyze the causes of the problem. Third, formulate disposal measures. Fourth, arrange for rectification. After the rectification, the results are uploaded to the model, forming a closed-loop process of quality problem discovery, analysis, processing and feedback. Through this process, all managers can keep abreast of site quality risks and information sharing. At the same time, managers should strengthen the closed-loop control of quality to prevent the situation without rectification.

### 3.4 Processing Phase

With the progress of the project, various construction projects will be affected by various factors. Which will affect the start of the next construction project. The BIM platform will monitor the progress of the project and warn the deviated project. In cost management, by comparing the target cost with the actual cost, we can find the cost loopholes in time. With BIM technology information integration capability, we can provide more accurate basis for project planning. Such as analyses the deviation between actual progress and planned progress, analyses the deviation between actual material consumption and planned consumption, counts the difference between different projects, and so on.

## 4. Advantages of BIM Technology in Construction Quality Management

### 4.1 Integrated Management of Construction Projects

The project management mode of BIM technology is mainly embodied in the integrated delivery mode of IPD project. With this management mode, managers can greatly improve the quality control effect of construction projects. BIM technology realizes the construction quality control of each stage of construction project.

## 4.2 Comprehensive record information

After modeling, BIM technology can input the information involved into the model one by one, such as building engineering information, construction machinery information, building materials information, various large mechanical parts and other information. BIM technology is used to track and record products. It realizes the comprehensive storage and recording of construction information, and makes the storage information visualized. BIM technology can improve the management of water products in construction enterprises.

## 5. Conclusions

The 21st century is an information age, big data is everywhere. BIM technology conforms to the requirements of the development of the times, and it will encounter certain obstacles. However, with the increase of BIM research efforts, the scope of application will be further expanded in the future. Finally, BIM will bring considerable economic and social benefits to the construction industry. Although there are many difficulties in the application of BIM technology at this stage, with the improvement of building management products, BIM technology has a larger development space in the construction quality management of construction projects. BIM technology will bring greater economic benefits and realize continuous optimization of quality m

## References

- [1] Duan Liu Jie. *Application exploration of bim technology in construction management of construction engineering* [J]. *Residence*, 2019 (08): 126.
- [2] Xie Bin, Chen Chaozheng and Meng Xianglong. *Application of bim technology in construction of a housing project* [J]. *Sichuan Architecture*, 2016, 36 (3): 293-294.
- [3] Su Qiaozhi. *Research and application of bim technology in housing construction* [J]. *Economic Management (Full Text Edition)*, 2016 (8): 00019-00019.
- [4] Zhang Haiping. *Research and application of bim technology in housing construction* [J]. *Global Market*, 2017 (6): 182-182.
- [5] Xiong Wei. *Exploring the application of BIM technology in construction management of construction engineering* [J]. *Residence*, 2019 (05): 64.