

Analysis of Bim-Based Project Cost Management Maturity Model under the Vat Reform

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Abstract: Under the reform of the camp, BIM technology plays an essential role in the actual work. BIM technology can integrate a large amount of information in engineering construction on the basis of three-dimensional technology. At the same time, China's tax authorities vigorously promote the implementation of the pilot reform of the camp. Under such a background, China's construction industry is required not only to pay attention to economic development. The energy problem should also be placed at the key position in the process of enterprise development, which requires relevant units to constantly improve the level of project cost management. Under the implementation of the reform of the tax system of the business reform, the requirements of the project cost on marketization and informatization are more strict. Under the implementation of the reform of the tax system of the business reform, the requirements of the project cost on marketization and informatization are more strict. BIM Technology is fast, accurate in cost calculation and real-time control of the construction dynamic, multi angle problem and efficient cost control problem. BIM is no longer limited to plane, and the data drawn is not limited to points, lines and faces, but involves the building components with accurate parameters such as walls, doors, windows, etc. BIM Technology has the advantages of fast calculation, accuracy and stability, and can control the construction process of the project in real time. This paper mainly discusses and analyzes the project cost management based on BIM Technology under the operation reform and increase, and seeks the key points of project cost management in this process, and provides a theoretical support for the construction of various projects in China.

1. Introduction

The advantages of BIM technology in project cost management are being demonstrated with its continuous application. BIM technology project cost management plays an essential role in the actual work under the reform of the camp. BIM technology can integrate a large amount of information in engineering construction on the basis of three-dimensional technology [1]. After the reform of the camp, the market-oriented informationization requirements of project cost management are getting higher and higher, and the application of BIM technology in project cost management is becoming more and more effective. The application of BIM technology in project cost management provides the possibility to effectively overcome some existing defects [2]. At the

same time, China's tax authorities vigorously promote the implementation of the pilot reform of the camp. Under such a background, China's construction industry is required not only to pay attention to economic development [3]. It is also necessary to put energy issues in the key position in the process of enterprise development, which requires relevant units to continuously improve the level of project cost management. In the aspect of project cost, BIM Technology can not only grasp the dynamic of project construction in real time, but also calculate the quantity accurately and quickly. Comparing the amount of calculation from multiple angles, whether it is the problem of efficient cost control, or the problem of using massive building information sharing, can be solved [4]. Under the implementation of the tax system reform of replacing business tax with value-added tax, the requirements of project cost for marketization and informatization are more stringent. The application of BIM Technology plays an important role in the construction dynamics and cost management reform of project cost.

The implementation of the tax system for the reform of the camp has brought new influences and changes to the project cost, which analyzes the cost system in China at present [5]. The engineering pricing rules, pricing basis and cost information will change greatly in turn, and the participants in each link will adjust the management of engineering cost according to the new tax system reform. BIM technology can quickly and accurately calculate the cost, control the dynamic and real-time construction, and solve the problems of multi-angle problems and efficient cost control [6]. Whether it is the basis and rules of project pricing, or the cost information, there have been changes, combined with the system, adjust the cost management of all parties. BIM is no longer limited to plane, and the data drawn is no longer limited to points, lines and surfaces, but involves building components with accurate parameters such as walls, doors and windows [7]. BIM Technology has the advantages of fast, accurate and stable calculation, which can control the construction process of the project in real time. By comparing the calculation amount from various angles and aspects, we can better solve the problems of huge information data, difficult sharing and cost control, and promote the reform and development of project cost management [8].

2. A Brief Introduction of Bim Technology and Its Application Status

2.1 Introduction to Blm

BIM technology is the building information model. Building information model, as its name implies, refers to a data-based tool applied to engineering design and construction management, which is a model based on digital information [9]. Specifically, the parameter model is used to integrate a series of related information of various projects, which can be used for digital methods of design, construction and management. This method supports the integrated management environment of construction engineering, which can significantly improve the efficiency and reduce the risk in the whole process of construction engineering. China's current project cost management has the following characteristics: many participants, many links, systematic and dynamic [10]. This way is mainly adopted in the integrated building management environment, which can significantly enhance the construction efficiency of the project and reduce the probability of risk. In terms of project contract, employees of engineering enterprises should verify the payment in the contract with the owner, and make BIM model with relevant data, so as to clearly observe the development of BIM Technology.

Gradually realize 5D technologies and methods that are conducive to cost management, provide cost and contract management information, and increase the feasibility of changing claims to improve work efficiency and avoid waste. Figure 1 shows the design of the construction cost control system based on BIM5D.

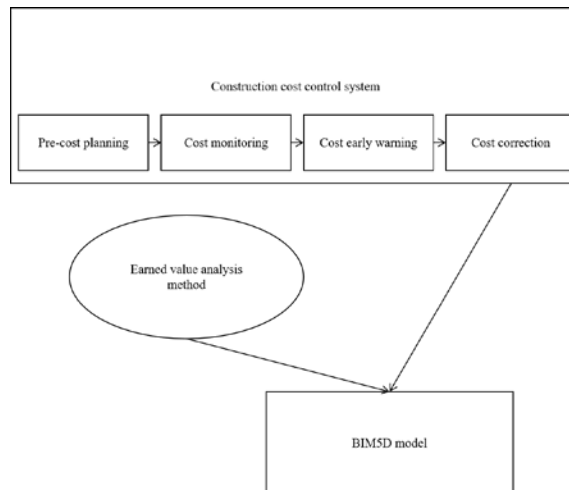


Fig.1 Design Drawing of Engineering Cost Control System Based on Bim5d

2.2 Present Situation of Technology Application in China

The management of project cost is realized quickly by using BIM technology to strengthen the project budget. However, in the past, the engineering information model in engineering cost management mainly used drawings and paper documents, which made it difficult to ensure that the overall planning work was carried out efficiently in the process of project schedule adjustment and technical change. As a result, it is difficult for all parties to dock, and finally the construction period is delayed. In China, BIM Technology has been widely used over the years, but compared with some developed countries, there is still a significant gap, and if you want to narrow the gap with developed countries, then you have to make great efforts. When building bim5d model, it is necessary to associate the project schedule and cost through WBS. In the current mode of bill of quantities pricing, WBS is the basis of project schedule and an important tool for compiling bill of quantities pricing table. As shown in Figure 2, the project schedule and cost correlation model.



Fig.2 Project Schedule and Cost Correlation Model

Specifically, first of all, China's construction industry is different from foreign countries. China's construction industry not only involves the market, but also needs to be supervised by the government. To a certain extent, there is a big gap in the application of BIM technology between China and foreign construction industry. The former is generally used as the calculation standard for the investment amount of engineering projects, while the fixed valuation pays attention to one-sided unity. Because there is a big difference between the actual project and the theoretical scheme, the difference between the project cost budget and the final accounts is also very big. Without considering this, the interests of construction enterprises will be seriously affected. In addition, due to the complexity of BIM Technology, China lacks such technicians, so it is difficult to make the best use of BIM Technology.

3. Project Cost Management Based on Bim Technology under the Vat Reform

3.1 Bidding Stage

In the bidding stage, the tenderer usually invites bidders publicly. Bidders with certain qualifications will make preliminary appraisal according to relevant project conditions, and then the tenderer will determine the bidders according to its own standards, and finally sign the bidding contract. There are difficulties in coordination among project participants. There are differences in BIM models, which require manual screening by cost personnel. The compatibility of BIM technology-related engineering cost management software is not strong, and the technology needs to be improved. In the current complex market environment, there are more and more cases of low-price bidding, and it has gradually become a trend. If you want to win the bid, you must spend a lot of manpower and money. However, after the implementation of replacing business tax with value-added tax, construction projects are becoming more and more complex. In the process of modeling with BIM software, it has great advantages to analyze the quantities more accurately. In the previous project cost management, the staff mainly completed this task by drawing and calculating on paper, which led to the uncoordinated staff of all aspects, and then led to the slow progress of the project. In this way, we can effectively reduce the amount of calculation, optimize the details, and actively participate in the overall work.

3.2 Settlement Stage

Effectively apply BIM technology to settle project management. Settlement is a crucial link in the completion stage of construction projects. Even if the cost reduction of the affected project is very small, it has a strong guiding significance for improving the management mode of project construction and statistical engineering data in the future. Because of the fierce competition in the construction industry, enterprises must strengthen their own strength, and the level of bidding is closely related to the survival and development of enterprises. However, with the implementation of replacing business tax with value-added tax (VAT) and the increasingly complex construction projects. When using BIM software for modeling, it can more accurately analyze the engineering quantity, and has obvious advantages. Coupled with the more complex modern engineering, the speed of material use is difficult to obtain rapid statistics. It leads to the use of too many or too few materials, wastes a lot of money, and increases the difficulty of project cost management. The composition of construction cost is shown in Figure 3.

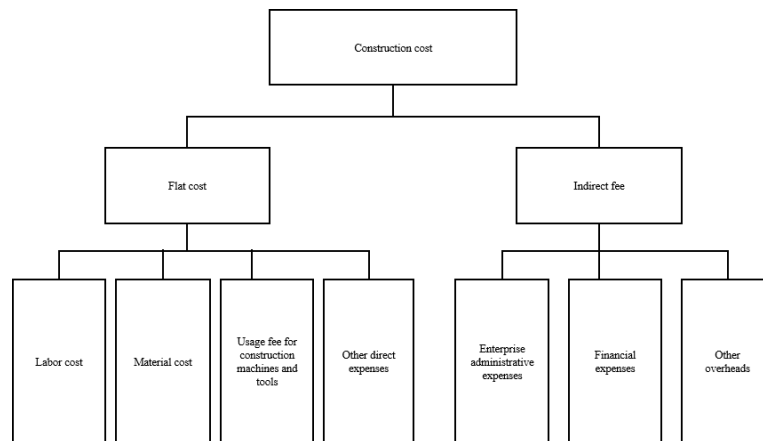


Fig.3 Composition of Construction Costs

BIM software completely breaks through the limitation that the traditional cost software needs to rely on the text format to operate. By using BIM software, the cost of each part of the project can be clearly defined. On the one hand, it can guarantee the settlement efficiency, on the other hand, it can purchase accurately at any time according to the progress of different stages of the project, so as to realize the cost management of the whole process. The phenomenon of delay in fund settlement will not happen.

4. Conclusions

To sum up, because of the continuous development and application of the reform of the camp, it has brought great changes to the project cost management, which is beneficial to the rational allocation of resources by the construction party, speeding up the project progress and bringing various benefits to the construction project. The reason why most of the previous laws of project cost management have been eliminated is that BIM technology has accurate and fast functions in project cost management after the reform of the camp. At present, BIM technology is applied in project cost management, although there are still some obstacles. However, some standards and specifications of BIM Technology are constantly introduced, constantly improving the function of BIM project cost management software, and improving the project collaborative management mechanism. In the actual operation of small and medium-sized construction enterprises, leaders should be fully aware of the important practical significance of the implementation of cost control, and improve the ideological and cognitive level. With the continuous development of modern science and technology, BIM Technology has been gradually applied to various parts of engineering construction. This requires relevant personnel to fully grasp the application technology of BIM model, and effectively apply it to the project cost work, so as to provide convenience for the construction cost management as far as possible while ensuring the project quality, and contribute to the development of China's construction industry.

References

- [1] Shen Hongjun, Chen Weigang. *Research on project cost management based on BIM technology under the transition from business tax to business tax. Chinese and Foreign Construction*, vol. 000, no. 002, pp. 172-174, 2019.
- [2] Liang Jianping. *Research on engineering cost management based on BIM technology under the VAT reform. Building materials and decoration*, vol. 593, no. 32, pp. 163-164, 2019.
- [3] Wu Xiufang. *On the fine management of construction enterprises. Journal of Hebei Institute of Civil Engineering and Architecture*, vol. 034, no. 003, pp. 116-118, 2016.
- [4] Ji Jianmin. *Tax planning strategies of construction companies under the background of the VAT reform. China*

- Industrial Economics*, vol. 255, no. 23, pp. 30-31, 2020.
- [5] Liu Yubei. *Application of BIM in the life cycle management of expressway electromechanical engineering. Engineering technology development*, vol. 2, no. 1, pp. 39-40, 2021.
- [6] Hu Bin. *Practical discussion on engineering cost management based on BIM technology. Building materials and decoration*, vol. 565, no. 04, pp. 140-141, 2019.
- [7] Sun Jinglu. *Leveraging PPP to boost the transformation and upgrading of cost consulting enterprises. China Construction Information Technology*, vol. 000, no. 018, pp. 16-19, 2017.
- [8] Wang Weiping. *Elementary discussion on the influence factors of construction project cost under the new form and the countermeasures to reduce the project cost. Big Science and Technology*, vol. 000, no. 013, pp. 247-248, 2016.
- [9] Zheng Xiaocang. *Analysis of new features and measures of project settlement under the background of the VAT reform policy. Building materials and decoration*, vol. 573, no. 12, pp. 225-226, 2019.
- [10] Wang Ying. *Analysis of the pricing countermeasures for the bidding of construction general contracting projects under the VAT reform. Chemical Management*, vol. 530, no. 23, pp. 160-161, 2019.