Problems in the Whole Process of Management and Control of Construction Cost and Cost Management Strategies

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Abstract. In the project construction process, the cost level directly affects the investment benefit of the project. In order to ensure the overall quality and management level of construction projects, construction enterprises need to actively improve and innovate cost management and maximize the quality of cost management. This paper expounds on the research background of the whole cost management process, analyzes the influencing factors of the current project cost management, and finally puts forward specific cost management strategies for different stages to promote the improvement of China's project cost management level. Currently, problems in the whole process of management and control of construction cost include unreasonable preparation of project cost budget, inadequate budget consideration, and inadequate process control of project cost. This paper finally conducts cost control through detailed management, BIM technology, dynamic control decision-making and other methods, and adjusts the control process through investigation and research on different stages of decision-making.

Keywords: Management and control of construction cost; Problems; Cost management strategies.

1. Introduction

A novel cost management approach for building projects, project cost management emphasizes determining and controlling the project cost [1]. To help construction enterprises increase their financial benefits, the cost engineer should thoroughly understand the cost usage throughout the project's various construction stages. They should also identify potential cost waste issues early on and take targeted action to address them.

The goal of the so-called engineering cost of civil engineering is to equitably determine and successfully control the costs associated with the entire life cycle of civil engineering, as well as to increase the range of economic benefits on the presumption that civil engineering could be of high quality and safety. According to the time dimension, the civil engineering system's whole life cycle includes the investment decision-making stage, design stage, bidding stage, construction stage, and completion acceptance settlement stage [2]. The term "cost" refers to every expense incurred throughout the five stages mentioned above, including survey and design fees as well as the cost of labor for various tasks.

This study analyzes the current problems of project cost management, and proposes specific cost management strategies for different construction stages.

2. Characteristics and importance of construction project cost

(1) Production has liquidity. On the one hand, construction projects change with the change of the location of buildings and structures; On the other hand, the construction personnel would apply some mechanical equipment and electrical equipment in the construction process, and different equipment is used for various construction parts, and flow up, down, left and right along the construction object, resulting in changes in the operation site [3].

(2) The product forms are diverse. The current buildings show a diversified development trend. In different environments, buildings have different uses. In order to meet their needs, construction enterprises need to use different materials, structures and shapes. It has changed the construction method, and it is difficult to achieve standardization [4].

(3) Construction technology is complex. The construction of the building project involves a lot of content, requires multiple types of work and units to cooperate with the operation and construction, and uses many kinds of materials and equipment, so it presents the characteristics of complex construction technology.

(4) There are many open-air operations and high-place operations. Due to the large size of buildings, many open-air and high-altitude operations are often affected by the climate [5].

(5) The degree of mechanization is low. At present, the degree of building construction mechanization in China is low, so the construction of building projects still needs manual operation. The operation amount is large, resulting in low construction efficiency, which cannot be improved [6].

3. Problems in the whole process of management and control of construction cost

3.1. Unreasonable preparation of project cost budget

In construction projects, cost budget is the first link, providing a reference for cost management and control. However, there is a widespread problem of unreasonable project cost budgeting. The basic reason for this is that the staff of the budget department did not have a thorough understanding of the construction team's construction workload, manpower and material resources; the supervision department's control is not strong [8]. The unreasonable preparation of the project cost budget has brought some adverse effects to the construction enterprises, which makes the cost budget unable to provide financial expenditure guidance for construction and affects the construction management system.

3.2. Inadequate budget consideration

It needs to rely on the relevant staff to improve the accuracy of the cost budget. In the process of work, staffs need to collect all kinds of information to ensure the accuracy of their data, and analyze and explore based on relevant data. Construction of construction projects is complex, involving many factors, such as construction environment, material quality and price, operation of machinery and equipment, construction personnel, etc. These factors are mostly uncertain factors, so there is a problem of inadequate budget consideration, leading to deviation in price making budget management [9]. If the construction project takes it as a reference, it is easy to exceed the budget, directly affecting project cost management and construction operations.

3.3. Insufficient process control of project cost

The control and management of project costs should run through the whole process of construction. Before construction, relevant staff should control resource expenditure; During the construction, the staffs control the cost consumption in each link and the resource scheduling; After completion, the staffs do a good job in accounting to achieve cost management and control [10]. However, through investigation, it is found that the construction project has the problem of insufficient process control of project cost, which leads to the actual cost exceeding the budget.

3.4. Inadequate details of project cost control

The management and control of project cost should consider factors such as efficiency, quality and cost, and start with details. However, in the current project cost management and control work, there is a problem that the detail control is not in place, leading to the failure to maximize the reference function of the cost budget, resulting in problems such as unfettered financial expenditure and delayed project progress.

4. Cost management strategies

4.1. Use BIM technology to optimize quota design

Construction cost control belongs to dynamic project cost control, and quota design is a means for dynamic project cost control. With the development of the times, BIM technology comes into being in response to the situation and shows great advantages in optimizing quota design. Therefore, more and more technicians use BIM technology to guarantee the whole process management and control of construction cost, so that construction enterprises can bring higher economic benefits and guarantee the development of enterprises. BIM technology can be utilized in the following three aspects [11].

(1) Relevant staff need to establish the model database with the help of BIM technology, collect construction information, and design quota indicators.

(2) The staff can use BIM in unit price analysis to improve the accuracy of unit price analysis.

(3) BIM technology is used to calculate the data in the construction project. In this way, the design cost of the construction project can be reduced, and the rationalization and operability of the project design can be guaranteed.

4.2. Dynamic control decisions

Dynamic control decision-making is to carry out dynamic cost management in the decision-making stage. [12]. The decision-making stage is the most important stage in the construction project, and the use of dynamic control decision-making can enable construction enterprises to understand the cost changes in the construction of construction projects before construction and reduce some unnecessary expenses of enterprises. The staff needs to analyze various costs, establish a dynamic management model, understand the factors that can be used for cost management through data comparison and analysis, and strengthen the connection between cost control and construction engineering.

4.3. Integration process engineering cost

The integrated process engineering cost plays an important role in the whole process management and control of construction engineering cost, so the staff should pay attention to it. When carrying out cost management and control, staff should combine cost management with economic management theory, and establish a sound and scientific coordination mechanism to guarantee process engineering cost integration. This method can expand construction cost management's scope, improve efficiency, and bring higher economic benefits to construction enterprises [13].

5. The whole process of management and control of construction cost

5.1. Decision Phase

As mentioned above, the decision-making stage is an important stage in the whole process of management and control of the construction cost, so it needs to be taken as a key point to control the construction cost through effective means to bring higher economic benefits to the construction enterprises. Firstly, the staff needs to analyze the construction project's cost elements and clarify each cost item's role and requirements [14]. When conducting cost element analysis, relevant staff are usually required to combine relevant principles and modern cost analysis technology and to conduct comprehensive analysis from different perspectives. Secondly, the staff needs to use BIM technology to establish the database and estimate the cost according to relevant information. When making cost estimates, relevant staff should follow the strict and prudent principle to effectively collect and analyze relevant data to ensure that every data obtained is true and accurate. To avoid the risk of the wrong estimation to the greatest extent, it can guarantee the management and control of the whole cost process.

5.2. Design phase

Through investigation, it is found that it is common to delay the construction period and increase the project cost due to the discrepancy between the drawing design and the actual situation. Therefore, to carry out the whole process of management and control of construction cost, construction enterprises need to pay attention to the design stage. Specifically, the project cost management and control in the design stage can start from the following aspects:

(1) Feasibility study stage. In the feasibility study stage, relevant staff need to collect data based on market demand, formulate multiple design schemes, and analyze the schemes from the aspects of policies, laws and regulations, safety and environmental protection after formulating the design schemes. They aim to find out the design schemes that are technologically advanced, economically reasonable and meet the requirements [15].

(2) Preliminary design stage. The design stage is an important stage of construction cost control, and the preliminary design stage is the beginning of the design stage, so relevant staff should pay attention to it. Generally, the preliminary design stage requirements meet customer requirements, reasonable funds, and feasible design. Therefore, in this stage, relevant staff need to conduct investigation, analysis and research, select the most suitable design scheme, adopt effective means to optimize design and quota design, and ensure that the project cost is reasonable [16].

(3) Construction drawing design stage. The construction drawing is the reference to the construction of the building project, the theoretical basis for bidding and controlling the appropriation, and the basic data for settlement. Therefore, the relevant staff should make clear the significance of the construction drawing design and take the initiative to understand the site conditions, to carry out the reasonable design. During the construction drawing design, the relevant staff should achieve complete functions, sufficient safety, design changes and project investment control within the minimum range.

5.3. Bidding phase

The bidding stage can directly affect the construction cost. When conducting project cost control in the bidding stage, construction enterprises need to start from the following aspects:

(1) Adopt the method of quotation of bill of quantities. First, the relevant staff should calculate the construction project according to the national unified engineering quantity calculation rules, control the labor, materials, construction machinery and other elements, and ensure the bid price based on this. However, this bidding method has certain risks, so the bidder should bear corresponding risks.

(2) Innovate the bid evaluation methods of construction projects. These problems exist in the current bid evaluation methods, so the construction project cost control has been affected. Therefore, it is necessary to innovate the bid evaluation methods of construction projects. In other words, the unreasonable price should not be the highest and lowest price, but the low price should be lower than the individual cost and the high price higher than the base bid price. Moreover, the bid evaluation method should be selected according to the characteristics of the construction project.

(3) The tendered must attach importance to bid evaluation.

(4) Attach importance to the review of bidding documents. Only in this, way can we do a good job in the bidding stage of price management and control.

5.4. Stage of signing construction contract

Generally, the construction unit needs to sign a construction contract with the construction team to ensure the construction cost control of the construction project. Most of the construction contracts based on the bill of quantities pricing mode are comprehensive unit price contracts, because such cooperation has certain advantages in handling claims and changes. However, when signing the agreement, the relevant staff shall specify the scope and method of contract price adjustment based on the bill of quantities and the contents of the bidding documents. In case of subsequent changes, a supplementary agreement should be signed. In addition, all written materials should be kept completely during construction.

5.5. Construction phase

(1) Conduct material management. There is a big difference between the construction of building engineering and other industrial construction, which requires a variety of market materials, and the prices of these materials are different, which could change with the market change. It means that,material management is important. First, the construction enterprises need to ask the purchasers to pay attention to the changes in the market price of teaching materials and follow the principle of "comparing goods with others" when introducing various materials and introduce the building materials with the highest cost performance [17]. Secondly, construction enterprises need to require warehouse keepers to effectively control building materials and reduce the loss rate of building materials through classified storage and effective management.

(2) Change management. The construction of a building project is often affected by force majeure factors, resulting in a change in project cost. To reduce cost change and guarantee construction cost, construction enterprises must strictly control the construction process. The change should be approved and signed by relevant staff if the difference still occurs. In addition, for the change problem, the construction party must settle accounts before spending money. Because changes could lead to changes in the cost budget, the project cost management and control can only be carried out if you know well.

(3) Site visa and concealed works record management. According to experience, if the on-site visa is not strict and the management of concealed works records is poor, there will be disputes, which will have an invisible impact on the project cost control.

5.6. Completion settlement phase

(1) The total unit price of new projects caused by design changes or omissions in the list shall be proposed by the undertaker and used as the basis for settlement after the employer's consent.

(2) If the quantities change due to errors in the quantities and design changes, appropriate methods should be selected for settlement according to the actual situation. For example, if it is within the scope of the contract, the employer needs to settle based on the original comprehensive unit price. If it is within the scope agreed in the contract, it should be reviewed and confirmed by the employer and the supervisor after proposed by the contractor, and it should be used as the basis for settlement if there is no error. Only when the completion settlement work is done well, can the whole process management and control of project cost be truly achieved [18].

6. Conclusion

Cost management and control must run through the construction process to bring economic benefits and promote sustainable development. The detailed analysis of different stages of the project is conducive to controlling costs from different time nodes, so as to achieve the efficiency of reducing costs

When conducting construction project cost management and control, construction enterprises can apply BIM technology to optimize quota design to realize project cost management. Construction enterprises can also use dynamic control decisions to achieve efficient cost control, and integrate process engineering costs to expand the construction engineering cost management scope and improve management efficiency.

In this way, the design and construction costs can be reduced by controlling all links while ensuring the building quality, and the economic benefits of the construction enterprise can be increased imperceptibly.

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