Research on Engineering Cost based on Full Life Cycle Theory

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Abstract: Cost management is one of the most important contents in China's engineering construction. Engineering cost and benefit are greatly affected by cost management. However, due to the influence of traditional planned economic model, some problems in China's whole process engineering cost management are gradually coming into being. It has been found that it is necessary to study the life cycle theory in project cost management, explore the model of project cost management, and bring out the advantages of life cycle to project cost management.

1. Introduction

In most of the project cost management, the whole life cycle theory has been effectively applied. It can not only comprehensively consider the cost and cost, but also pay attention to the safety of the project on the basis of ensuring the quality of the project. Effective reduction of the total cost of construction and total cost is conducive to improving the economic and social benefits of the project. The application of the whole life cycle in the field of engineering construction in China has a great effect on the innovation of engineering cost management mode. Therefore, this paper carries out the research of the whole life cycle theory in engineering cost management to promote the good application of the whole life cycle theory.

2. The connotation and characteristics of the whole life cycle engineering cost management

The whole life cycle engineering cost management refers to a project (including pre-construction, construction period, use period, transformation and demolition stages) considering project cost and comprehensive use cost, and comprehensively applying multi-disciplinary methods and adopting comprehensive The integrated method, using mathematical models and engineering economics, makes the total cost of engineering construction and pre-construction, maintenance period and other stages reach a minimum investment cost and a management theory method of interest analysis and evaluation.

First, the full life cycle project cost theory goal is to minimize the total cost of the entire life cycle of the construction project, including construction costs and future operating and maintenance costs. Second, life cycle cost management should manage the entire process of the life cycle construction project. In addition to the simplest construction phase, it should also include the operation and maintenance phases of the decision phase, design phase, implementation phase and completion phase. Third, full life cycle cost management includes two aspects: one is the analysis of life cycle cost, and the other is the management of life cycle cost. Life cycle cost analysis primarily calculates costs from the life of the project. Life cycle cost management refers to ensuring the lowest management cost of each stage of the process by controlling the various processes of the construction project to ensure the lowest cost of the entire life cycle of the project. The analysis and management of project costs need to be coordinated and coordinated. Fourth, by examining the various processes of the construction project, it is possible to carry out detailed analysis and management of the costs of each phase of the cycle. The full life cycle cost management is not only an audit trail of a project cost management system, but also an initiative to control the cost project. The overall cost is minimized.

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3. Life cycle engineering cost management stage

For the division of the construction phase of the whole life cycle project, many researchers in the West and the actual staff of the engineering project have made a lot of theoretical research and practical conclusions. At the same time, for the division of the construction phase of the whole life cycle project, it is also necessary to take into account the differences between the various countries, and to conduct scientific and meticulous research on the national conditions of each country's economic environment and policies. Therefore, for the division of the whole life cycle stage of construction project in China, it is necessary to combine the national conditions of China and proceed from the actual situation in China to rationally segment and define the whole life cycle stage of the construction project. In terms of cost management, China's current general adoption of the cost management theory proposed by the China Construction Engineering Cost Management Association, and many European and American countries' construction projects use the life cycle cost management theory proposed by the Royal Institution of Chartered Surveyors. These two theories are somewhat similar in some respects, but their concerns are different. There are still differences and differences between the two. The main difference lies in the guiding ideology and time span. The whole process cost management theory adopted in China mainly focuses on the management of the cost of a project from the beginning of the decision to the construction and construction, and finally to the end of the project. The theory of life cycle cost management implemented in Europe and the United States is based on the division of construction projects into decision-making, design, construction, completion, and operation and maintenance. The costs of each stage are controlled and managed separately, and then from the project. The life cycle perspective is unified management of its cost.

A construction project can be divided into five phases: decision making, design, construction, acceptance, and operation and maintenance. The order and content of each stage implementation are also different. Then the management methods for each stage are different. Generally speaking, the management of the whole life cycle construction project can be carried out in the following order: project decision-making→ project design→ construction construction→ Completion acceptance → operation and maintenance. For the project decision-making stage, it is mainly responsible for the investment evaluation of whether the whole project is implemented. It is the key to decide whether the project can be carried out. The cost of this stage is mainly the cost of decision-making evaluation; the project design stage is adopted in the project construction project. After the evaluation decision, the overall project process, cost management and overall planning are managed and cost-effectively managed; the main content of the project implementation phase includes the bidding of the construction project cost management and the signing of the project contract, the construction of the project construction And the costs incurred in management, the cost of bidding is put into the implementation stage because the bidding and construction are relatively close; the completion and acceptance stage of the project is mainly after the completion of the project construction, and the completion settlement and project acceptance of its cost and other aspects. The cost of the last phase is the operation and maintenance of the construction project, which mainly refers to the cost incurred in the operation and maintenance of the project and controls it.

4. Advantages and disadvantages of the whole life cycle engineering cost management

First of all, from the scientific nature of investment decision-making, through life cycle analysis, from the perspective of the entire process of the project to cost planning and management, and comprehensive consideration of management costs, taking into account the multiple feasibility of the program, according to the maximum reduction of life The principle of cycle cost, choose the best investment plan, so as to realize the scientific and rational investment decision. Secondly, it is necessary to analyze from the perspective of time span. The whole life cycle theory requires that the cost of a certain stage cannot be viewed in isolation. It is necessary to proceed from the overall situation and consider the time period of the whole project to analyze the project cost in the whole

time period. And control so that it can be more effective and reasonable. Third, analyze the problem from the perspective of the specific implementation process of the project. By learning and understanding the spirit and method of cost management of the whole life cycle project, not only can the project cost control be minimized, but also the architectural design and engineering contract can be considered. The overall planning and evaluation of the construction plan can not only affect the quality of the project, but also control the cost of the project.

Fourth, from the point of view of whether the design is reasonable, by learning and understanding the spirit and method of cost management of the whole life cycle project, the designer can be guided to more consciously and habitually consider the problem and design project from the perspective of the entire cycle of the project. Therefore, in the design stage, the various construction costs and operation and maintenance costs of the project can be considered, and the selection of the architectural design plan and the building materials is more reasonable. From the perspective of the project life cycle, the design quality is ensured and the overall project cost is obtained. The goal of control. Finally, from the perspective of environmental protection and ecological construction, using the spirit and method of life cycle project cost management to standardize the project construction, cost and cost issues can be considered from the perspective of the project life cycle and analyzed. And calculations. Therefore, for all aspects of the entire life cycle, through the reasonable planning and design and the use of water-saving and energy-saving facilities in line with national and even international standards, energy-saving and pollution-free green building materials, targeted collection of recyclable materials And measures such as preservation not only minimize the construction cost of the project, but also ensure that the implementation of the project is coordinated with the ecological development from a macro perspective, and it is more environmentally friendly and energy-saving, and achieves the goal of improving the construction of social welfare projects. The full life cycle cost management is largely applicable only to the evaluation and selection of various options applicable to construction projects, and cannot be directly used to accurately estimate the cost or cost of a construction project. Therefore, the life cycle cost management has certain limitations in application. The life cycle of a construction project has many uncertain aspects in the initial stage and construction stage of the construction project, and it is difficult to find a suiTable method. For these reasons, the life cycle cost management theory is only used as a guiding method and guiding ideology for the decision-making, construction plan and construction plan optimization of construction projects.

5. Application measures for the whole life cycle of project cost management

The use of scientific and effective analysis and planning to carry out investment decisions for engineering projects requires first research on the rationality and feasibility of the construction project, and then the final investment decision. However, in the decision-making stage, it is necessary to collect and organize all aspects of the construction project in detail, fully understand the information in all aspects, and make decision-making plans based on the whole life cycle to minimize the engineering cost and maximize the engineering benefits.

Before carrying out the design of the project, it is necessary to comprehensively and systematically consider the construction site of the project and the quality of the indoor environment. It is also necessary to take into consideration the construction organization and engineering contracts and technical factors, and prepare solutions and measures in advance. Possible problems, so as to reduce the project cost while ensuring the smooth development of the project.

In order to control the project cost in the implementation stage of the project, it is necessary to set a standard target value, compare the actual value of the project cost with the target value, and ensure that the actual value of the project cost will not be exceeded. In the construction stage, the various costs in the project cost should be used reasonably, and the use of the cost should be more efficient. In the final project price settlement, the project should be based on the measurement of the project, using the scientific engineering construction plan and reasonable. Project contract planning and construction design plans take into account the project cost of the entire life cycle.

The application of the whole life cycle should be carried out in combination with the actual

construction management. Generally, the whole life cycle engineering cost management can be divided into five stages: first, the decision stage. The main reason is to estimate the investment of the project to see if it meets the investment requirements; the second is the design phase. The main purpose is to carry out preliminary design budget for the construction drawing of the project, so as to carry out cost management; again, the acceptance phase. After the completion of the project, the overall project cost management needs to be calculated; finally, the operation and maintenance phase. The use of the maintenance phase in the life cycle engineering cost management is the final phase, and the relevant departments need to conduct reasonable cost management for the operation and maintenance of the project.

6. Conclusion

In order to promote the development of engineering cost management in a scientific and rational direction, the use of the whole life cycle can play a greater role, not only can effectively reduce the total cost of engineering cost in engineering cost management, but also scientifically avoid the engineering Unknown risks reduce unnecessary costs and increase the economic and social benefits of the project.

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