



Research on Key Factors and Management Strategies of Project Cost Control

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Abstract: In order to explore the key factors and management strategies of project cost control, this article adopts literature analysis method to deeply analyze various factors that affect project costs, including decision-making in project planning phase, management in construction phase, and changes in external environment. Research has shown that scope determination and design scheme selection in project planning have a significant impact on cost control, and technology and human resource management in the construction process cannot be ignored. In addition, market price fluctuations and changes in policies and regulations also have a significant impact on project costs. Based on these analyses, a series of effective management strategies have been proposed, including strengthening project planning management, implementing dynamic cost monitoring, and enhancing the ability to respond to external environmental changes.

Keywords: project costs; control factors; management strategy; cost management; engineering project

1. Introduction

In modern engineering project management, cost control has become one of the key management links, directly related to the economic benefits and successful implementation of the project. With the intensification of market competition and the development of technology, engineering projects are facing increasing cost pressures. How to effectively control project costs has become an urgent problem to be solved. Currently, many engineering projects suffer from cost overruns due to the lack of systematic cost control measures in the design, construction, and later operation processes, which in turn affects the overall efficiency of the project.

2. Key factors in project cost control

2.1 Decision factors in the project planning phase

The project planning phase is the foundation of project cost control, and the decision-making directly affect the subsequent design and construction processes. At this stage, the first step is to conduct a comprehensive requirements analysis to clarify the goals and scope of the project, including detailed confirmation of functional requirements, usage requirements, and investment budget, thus avoiding cost increases due to changes in requirements in the subsequent construction progress. In addition, the design scheme selection is also one of the key factors. Reasonable design scheme can not only meet functional and aesthetic requirements, but also effectively control material usage and construction complexity, thereby reducing costs. At the same time, the location selection of the project will also significantly affect the project costs, such as differences in labor costs, material transportation costs, and local policies in different regions. Therefore, conducting sufficient market research during the planning phase to understand local market dynamics and price trends is crucial for making reasonable predictions and controlling costs. In addition, the formation and management of project teams are also important factors that cannot be ignored. A professional and experienced team can make more scientific decisions during the planning phase, laying a solid foundation for the smooth implementation of the project.[1]

2.2 Influencing factors during the construction phase

The construction phase is the core link of project cost control, and its influencing factors are diverse, directly related to the final cost of the project. At this stage, the selection of construction technology is particularly important. Adopting advanced construction technology can improve construction efficiency, reduce project duration, thus lowering the cost of labor and equipment usage. In addition, resource management during the construction process, including the procurement, storage, and use of materials, are important factors that affect the project costs. Reasonable supply chain management can not only ensure timely delivery of materials, but also reduce material costs through bargaining and bulk procurement. At the same time, the management of construction sites cannot be ignored. Effective site management can reduce waste, lower accident

rates, and ultimately lower additional costs. Moreover, the allocation and management of human resources are also crucial. Skilled workers and efficient teamwork can improve construction efficiency and reduce economic losses caused by human errors. During this process, real-time cost monitoring and feedback mechanisms are also extremely important. Through timely cost accounting and analysis, cost overruns can be identified and corrected, ensuring that the project is completed within budget.

2.3 External environmental factors

The impact of external environmental factors on project costs cannot be ignored, which usually includes market economy conditions, policies and regulations, natural environment, and social culture. Firstly, the market economy directly affects material prices and labor costs, especially during economic fluctuations. The supply-demand relationship of building materials may lead to drastic price fluctuations, thereby affecting project budgets. Therefore, project managers need to closely monitor market trends and make market forecasts in order to adopt corresponding response strategies. Secondly, changes in various policies and regulations, such as safety standards and environmental requirements in the construction industry, may also have a direct impact on project costs. The new regulations may require higher safety standards or environmental measures, increasing the project construction cost. In terms of natural environment, geographical conditions, climate changes, and natural disasters may also affect construction progress and costs. For example, adverse weather conditions may cause delays in the construction phase, thereby increasing the cost of labor and equipment usage. Finally, socio-cultural factors such as public acceptance and support for construction projects can also affect the smooth progress of the project. If there are objections, it may lead to project delays or additional communication costs.[2]

3. Management strategies for project cost control

3.1 Strengthening project planning and management

Strengthening project planning and management is the foundation and key link to ensure project cost control. In the early stages of a project, detailed requirement analysis and clear project objectives can effectively guide subsequent design and construction. Firstly, the project team should fully understand the owner's needs, including various requirements such as functionality, quality, and time, and transform them into a clear project scope and budget. Through scientific market research, the team can grasp material prices, labor costs, and industry standards, thereby providing data support for reasonable budgeting. In addition, the selection of design schemes should not only consider aesthetics and functionality, but also pay attention to economic costs. Adopting modular design or standardized components can significantly reduce material waste and construction difficulty. In order to achieve more efficient resource allocation, detailed time schedules need to be developed in project planning, and tasks at each stage should be arranged reasonably to ensure that all construction work is carried out in an orderly manner. At the same time, a risk management mechanism should be established to identify potential risks and develop response strategies in advance to reduce the impact of unforeseeable factors on costs. On this basis, modern information technology such as Building Information Modeling (BIM) can be utilized to conduct comprehensive cost forecasting and analysis during the planning phase, helping project teams better control costs.

3.2 Cost control during construction process

Effective cost control during the construction process is the core task in achieving the goals of project cost management. In terms of construction technology, choosing appropriate construction technology can bring significant benefits. For example, adopting new construction technology and utilizing more advanced construction methods can reduce the tedious processes in traditional techniques, thereby accelerating progress. The introduction of new equipment can improve the automation level of construction and reduce reliance on a large number of manual labor, thus reducing labor costs. At the same time, the technical team should continuously evaluate and introduce new technologies suitable for the project to constantly improve construction efficiency. In addition, reasonable resource management is crucial in project cost control. The project manager should ensure timely supply of materials, establish a detailed material demand plan, and maintain close communication with suppliers. Through a sound supply chain management system, strict screening and evaluation of suppliers are carried out to ensure stable material quality. Centralized procurement can obtain more favorable prices and reduce costs. Moreover, strict management should be implemented for the storage and use of materials to avoid waste and loss. In terms of on-site construction management, order organization and coordination are indispensable. Reasonably planning the layout of the construction site can ensure smooth connection between each process and reduce waiting time and idle resources. Strengthening the training and management of construction personnel can enhance their safety awareness and reduce the risk of accidents. Once an accident occurs, it will not only cause direct economic losses, but may also lead to project delays

and additional costs. Establishing a real-time monitoring cost management system can enable project teams to keep track of construction cost dynamics at any time.[3]

3.3 Enhancing the ability to respond to external environmental factors

Improving the ability to respond to external environmental factors is one of the important strategies for achieving project cost control. The fluctuation of market economy conditions influences significantly on projects, and changes in material prices and labor costs may lead to budget overruns. Project managers should conduct regular market research to gain a deeper understanding of market trends. For example, by visiting the building materials market and communicating with suppliers, one can grasp the price trends of various materials; and communicating with labor service companies is a good help for them to understand the changing trends in labor costs. Timely market information can provide scientific basis for budget formulation and approval, ensuring the rationality and accuracy of the project budget. The impact of the natural environment should not be underestimated, as factors such as weather and geological conditions may affect construction progress and costs. The project team should have a prior understanding of the natural environmental characteristics of the construction site and develop corresponding response measures, so that they can effectively arrange the construction plan and avoid adverse weather conditions. For example, accelerating the construction of foundation projects before the rainy season can avoid rework caused by rainwater immersion. For potential geological problems, conducting surveys and treatments in advance and taking necessary protective measures can reduce the negative impact of weather. The changes in the socio-cultural environment may also affect the progress of the project, and feedback from public opinion is particularly important. The project team should actively communicate with the public to understand their needs and concerns. For instance, during the project planning phase, public participation activities can be conducted for the project team to collect public opinions and optimize the project plan. At the same time, responding promptly to public questioning and criticism can establish a good public image. This can reduce the possibilities of project delays and cost increases caused by public opposition.

4. Conclusion

In summary, effective project cost control is crucial in modern engineering project management. By analyzing the key factors that affect project cost, this article proposes a series of management strategies to enhance the economic benefits of the engineering project. Firstly, the importance of the project planning phase cannot be ignored. Clarifying requirements and conducting market research are the foundation for cost control. Secondly, during the construction phase, selecting appropriate construction techniques and optimizing resource management can significantly improve efficiency and reduce costs. In addition, the project team also needs to strengthen the ability to respond to external environmental factors such as market fluctuations, policy changes, and the impact of natural conditions on project costs. Through real-time monitoring and flexible adjustments, the project team can promptly identify and resolve potential cost issues, ensuring the smooth completion of the project within the budget.

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