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The Whole Process Management of Rail Transit Project Cost under the New Situation

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Abstract: ***At present, the urban construction and development level of our country has improved significantly, and rail transit has become an important guarantee of urban operation. In the process of rail transit construction, we should attach great importance to the project cost and carry out the whole process management of the project cost, so as to ensure the quality of the project construction and improve the economic benefits of the project construction. The third scientific and technological revolution is rolling forward, and the development of Internet information technology promotes the dissemination and storage of traditional knowledge. Massive open online course, born on the basis of Internet information technology, has achieved the dissemination and sharing of global famous teacher resources and knowledge in various fields in a more open form by setting up educational information cloud platforms such as MOOC China, massive open online course Net and MOOC of China University, or by using database functions such as Baidu Cloud and Thunder Cloud Disk, which has greatly broken through the limitations of knowledge resources caused by single teacher teaching in traditional classrooms.***

Keywords: rail transit; Project cost; Whole process management.

1. INTRODUCTION

Nowadays, the development level of urban rail transit has been improved significantly, which also brings a lot of convenience for People's Daily travel. However, the cost of rail transit is also rising, which restricts the development of urban rail transit to a certain extent. In the process of cost control, a series of work from preliminary planning to project completion and acceptance should be done well to ensure the effective implementation of cost control. Massive open online course and educational psychology are briefly introduced above. Next, we dissect the “megaphone” massive open online course and analyze its characteristics and advantages, so as to clarify its internal roots in promoting the innovation of educational psychology teaching mode. Based on the author’s teaching experience and investigation results, massive open online course has two main characteristics, one is to share teaching resources, and the other is to interact with teachers and students. Specifically, massive open online course carries out teaching in the form of uploading recorded videos to online platforms or conducting live online broadcasts, which provides more choices and richer resources for the target and promotes the sharing of resources to the greatest extent. Furthermore, different from the traditional classroom teachers’ unilateral knowledge transfer to students, the teaching subjects in massive open online course are not limited to teachers, and students can also share their learning experiences and experiences online, which is transformed from unilateral transmission to teacher-student interaction, so as to realize the optimal education mode.

In urban rail transit planning, the cost input of the whole life cycle of the project is not fully considered, and the construction procedure cannot be strictly implemented in accordance with the process and standard. In the project planning, the planning scheme is not reasonable, and there are many changes in the project construction. The project cost was increased by blindly altering the planned route without seeking approval. The relevant staff did not plan the construction process according to the standard requirements. Many cities focus on underground rail transit construction, which increases the difficulty of construction to a certain extent. China’s “14th Five-Year Plan” requires “accelerating the construction of a high-quality education system”. The innovation of Internet information technology has injected new vitality into the field of education and promoted the development of massive open online course. Expanding the application of massive open online course in the teaching of educational psychology not only promotes the teaching effect, but also meets the requirements of the development of the times for building a high-quality education system and meets the needs of the people for high-quality education services. However, we should concern that the application effect of educational psychology in massive open online course is still not prominent enough, and there is still great room for improvement. Therefore, continuous research and exploration are needed to further enhance the “adhesion’’ between educational psychology and massive open online course, promote the in-depth reform of educational psychology teaching and realize the high-quality development of teaching.

2. ANALYSIS OF THE WHOLE PROCESS CONTROL OF THE COST OF URBAN RAIL TRANSIT ENGINEERING

The urban rail transit Line 3 is 22.15km long, and the underground line is 15.45km long. The project investment amounts to 14.2 billion yuan. In the construction of the project mainly for civil construction, track construction and installation of system equipment, and the project needs to install power, lighting, air conditioning, fire and other systems, so the project cost control content is more. The first is the concept of massive open online course. Massive Open Online Course is translated from English massive open online course, also referred to as “MOOC’’, which literally means a large-scale open online teaching course. Specifically, it refers to providing convenient teaching services to target audiences such as teachers and students by uploading

teaching videos or conducting live video broadcasts on the Internet platform. The so-called educational psychology refers to studying the psychological changes of human beings in learning and education under the educational environment by expounding the basic psychological laws of learning and education, so as to dialysis human educational psychology and promote the improvement of teaching quality and efficiency and the realization of teaching objectives. "Educational Psychology", as an important branch of psychology, are important basic courses in the curriculum system of normal education, which play a key role in cultivating high-quality teachers in primary and secondary schools and even serving basic education as a whole [2].

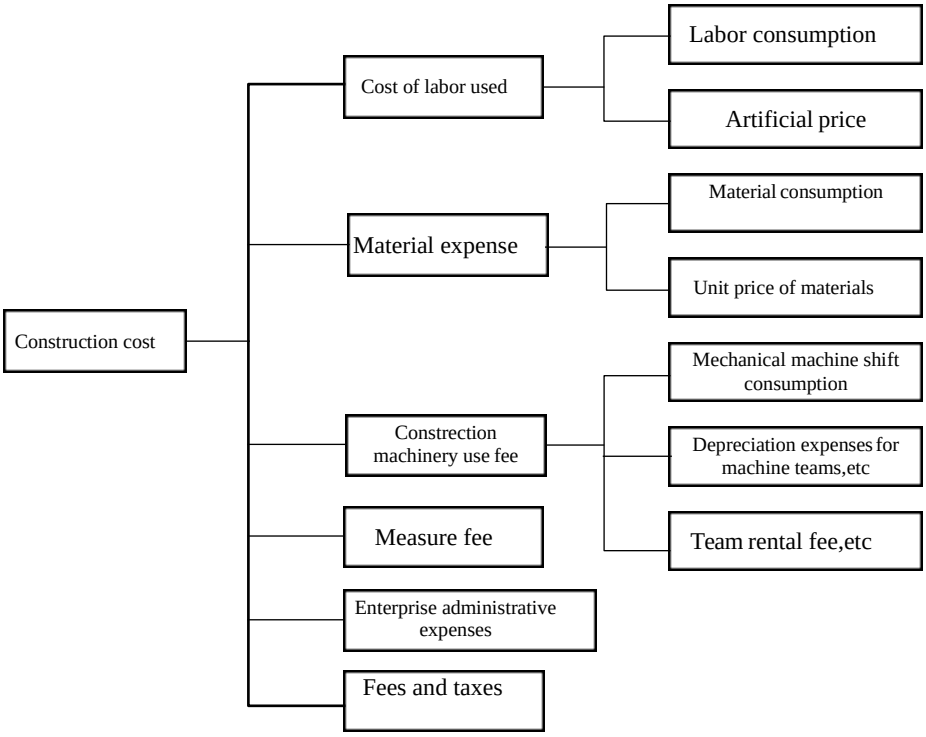

Figure 1: Construction cost composition

2.1 Cost control analysis in decision-making stage

First of all, scientific construction standards should be formulated. Subway construction standards have a great impact on subway construction. If more strict construction standards are established, the investment in project construction will be relatively high. There are many factors affecting the project cost, such as project scale, line setting and technical standards. If the scale of the project is too large, the effective use of funds cannot be guaranteed. Therefore, in the process of urban rail transit construction, we should always ensure the economic efficiency of the project and formulate scientific construction standards. Secondly, the network planning should maintain a harmonious relationship with urban planning and construction. In the work, we should make scientific and reasonable short-term and long-term rail transit network planning based on the overall urban planning. In addition, the future development trend of the city should be taken as an important influencing factor, and the route should be arranged closely along the city, so as to effectively reduce the land area and save land resources. Third, strictly control the cost of financing. In the financing of urban rail transit project, the government always occupies the main position. But the government is under increasing pressure to fund the investment it needs on its own. Under this background, a variety of cooperative construction modes have emerged. Different modes of cooperation

The cost of financing required varies, so low cost financing should be chosen based on national policies and local developments. At last, when making decisions on the project, decision-makers should carefully analyze the function, structure and traffic demand inside the city. Make function and safety a salient priority in planning. And attaches great importance to traffic demand in the development. Scientific analysis and screening of the planning scheme, so that the scheme has strong applicability and security. In addition, in the decision-making stage, we should scientifically choose the urban rail transit alignment, minimize the cost required in the construction process, and do a good job in the survey. And in the project cost decision, urban rail transit engineering is the main object, and it is necessary to plan the transportation network coordinated with urban development on this basis.

2.2 Analysis of cost control in the design stage

Massive open online course (MOOC), as a large-scale open network teaching mode, has become a "beacon" in the frontier field of education. It has not only expanded the application of massive open online course model in educational psychology, but also

realized the extension of traditional classroom; meanwhile, it has effectively improved the teaching effect of educational psychology. Based on the reality of massive open online course's teaching mode, this paper introduces massive open online course's content, characteristics and advantages by means of interview, data consultation and experience summary, and on this basis, analyzes massive open online course's influence and application on educational psychology, and provides some personal shallow thoughts for the purpose of being helpful to reality.

2.2.1 Constantly enhance designers' concept of cost control. In the process of design, if the design can not be improved and optimized, it will increase the capital investment in the project construction. Therefore, in the process of design, designers need to establish the concept of cost control, to ensure the feasibility of the technology and the rationality of the cost.

2.2.2 Implement the design bidding system. Using the bidding system to select high-quality design units, on the one hand to improve the rationality of the scheme, on the other hand, also need to reduce the cost of the project. The exploration and research of things begins with the basic definition. At the beginning of the thesis, we briefly introduce the concepts of massive open online course and educational psychology.

2.2.3 Strengthen quota design and control project cost. Quota design is usually completed within the specified range of investment to optimize the scheme, on the one hand to ensure the quality of the design scheme, on the other hand to reduce the cost input. In addition, in the engineering design, a meeting was held for cost control, and experts in related fields were invited to evaluate the design scheme, and the experts were grouped according to their specialties. After evaluation and analysis, experts found that the project design estimate is significantly higher than the approved investment, and the increase is about 10%, which meets the basic requirements of urban rail transit engineering cost control.

2.3 Details of cost control in the bidding stage

Fourthly, cost control in completion settlement stage. When the construction project is completed, the construction unit should not only apply for the completion settlement price, but also calculate and integrate the visa change and all the expenses of the project. Especially for the design changes and construction contracts of engineering projects, it is vital to carry out key audits, thus creating convenient conditions for the completion and settlement of later engineering projects. The financial personnel of the engineering project department should list the settlement list in advance, and make special explanations for the contents beyond the contract price. After the completion of the project settlement, it is necessary to compare and analyze the actual cost and the target cost, find out the reasons for the differences and constantly optimize the cost management process to help the construction enterprises obtain more economic benefits.

2.3.1 Constraint on tender price fluctuation

Bidding control price can truthfully feedback the specific content of the entire construction planning and design drawings. Generally speaking, urban rail transit engineering is characterized by heavy engineering tasks, long time span and close connection between internal engineering links. If relevant personnel cannot dynamically control the bidding control price, it will lead to the failure of the bidding enterprises to accurately identify risk factors and transfer unnecessary engineering costs to the tenderee. As a result, the bidding price of urban rail transit project increases, exceeding the preliminary budget of the project. In addition, to reasonably control the bidding price, the cost personnel should strictly control the details of the quotation, set the upper limit of the quotation, and avoid malicious bid raising by the bidding enterprises. The bidding price, which conforms to the reasonable range of cost accounting, can improve the risk identification ability and defense ability of construction enterprises and ensure the normal operation of the project.

2.3.2 Draft the project contract and analyze the details of the contract

In the drafting of the project contract, the cost personnel need to systematically and carefully analyze the specific terms of the contract, clearly divide the boundaries of responsibilities and rights, and reasonably control the construction cost of the project according to the contract terms. For this project, to clarify the comprehensive unit price and total price in the contract can disperse the risk and minimize the loss under the circumstances permitted by law.

2.4 Cost control strategy of project construction stage

In order to further improve the quality of project cost management, construction enterprises need to build a cost management team with high comprehensive quality and strong professionalism. It is required that the personnel in charge of project cost management must be familiar with the concept of project investment calculation, target cost and dynamic cost management, have complete experience in cost planning, and conduct in-depth analysis and research on cost management problems in combination with the specific characteristics of the project. In addition, the construction unit also needs you to do a good job in the business training of cost managers, and the construction enterprises should evaluate the business training results to ensure that the cost managers fully internalize the training content.

2.4.1 Rational introduction of investment supervision and management system

At the present stage, the more widely used investment control strategy in rail transit projects is to carry out a full range of consulting services for the cost work. The investment supervision and management unit should formulate detailed cost control details for the project construction side, maintain close contact and effective communication with the project supervision and management and the owner side, and calculate the investment of the construction planning drawings, stage cost settlement and construction Process changes and other contents shall be jointly discussed and discussed. After confirmation by multiple parties, the legal agent can sign and implement the project investment economic indicators.

2.4.2 Check construction planning drawings with high quality

For engineering projects that use bidding drawings for bidding, the key link is the investment accounting of construction planning drawings. Specifically, this work includes the following aspects: Project task volume settlement, unit price supplementary statement preparation and confirmation, fill in the approval summary list, only after the project participation units confirm, can be put into the actual project, and this process has certain legal benefits. First, construction enterprises should control the construction materials on site. The relevant material warehouse keeper must issue the corresponding material delivery document after the material is delivered out of the warehouse, and the material supplier name, purchase contract number, material name, unit price and quantity must be clearly marked in the delivery document. Before building materials are put into storage, they should be submitted to the project manager and purchasing personnel for acceptance and confirmation. Before materials enter the site, it is necessary to conduct repeated sampling inspection on the quality of materials to ensure that their performance and quality meet the construction requirements of the project. For materials with quality hidden dangers, it is strictly forbidden to enter the construction site. Second, well-prepared in the storage of construction materials. In order to reduce the waste of materials, it is significant to divide the designated storage area to store materials, and to store used materials and unused materials separately. Suitable storage conditions should be created for materials with requirements for storage environment.

2.4.3 Strengthen the discussion and management of project changes and participating units

In the construction stage, the second change of the project and the cooperative consultation of the participating units have practical significance, which can directly affect the final account of the project. Whether it is the project construction right contracting units, engineering planning and design units, engineering supervision and management units or construction units, as long as someone raised objections, they should be appointed by the parties to meet and discuss, confirm no error before signing, once the project construction involves the engineering geological structure conditions, but also have the signature of the chief policy personnel of the geological investigation department, must be strictly according to Implement engineering changes and talks with participating units according to legal procedures.

2.5 Comprehensive cost control is carried out for the completion settlement stage

The cost control of construction projects can't be carried out only for the interpretation of construction projects. It is essential to implement the cost management system in the whole process of construction projects, and combine the life cycle characteristics of construction projects to manage them from the pre-tender stage, construction preparation stage, construction stage and post-completion acceptance stage. The process of project cost management is systematic and coherent, and different types of cost control methods need to be applied in different stages.

Firstly, cost control is carried out in the bidding stage of engineering projects. Many construction enterprises pay too much attention to the cost control in the construction stage of engineering projects and neglect the cost control in the bidding stage. The quality of bidding cost control directly determines the level of project construction cost control. In the bidding stage of engineering projects, construction enterprises should effectively control the bidding cost according to the actual situation of the project, and indirectly improve the economic benefits of enterprises by doing a good job in bidding estimation.

Secondly, do a good job of cost control in the early stage of construction. The key purpose of cost control for construction enterprises in the early stage of project construction is to understand the needs of enterprises to undertake the project, and on this basis, optimize and improve the construction organization plan, implement the construction deployment, improve the progress plan, and do a good job in construction material procurement and mechanical equipment leasing. Finally, the target responsibility cost and planned cost of the project are defined in combination with the characteristics of the project, and the cost control level is continuously optimized.

Thirdly, control cost in construction stage. When managing the cost in the construction stage of an engineering project, the main management contents are cost management and cost analysis. Cost management mainly aims at managing all kinds of direct costs generated in the construction process. For example, the construction unit needs to manage the human resource cost, material cost and mechanical equipment cost. Before the construction, the technical personnel of the project department should know the general situation of the project cost, and focus on the technical review in the construction area where a large number of construction technologies are needed to ensure that the machinery, materials and labor costs are within the budget range, so as to ensure that the economic benefits of the enterprise will not be damaged. The cost analysis mainly focuses on the accounting results. After the project department obtains the cost accounting plan, it needs to be reported to the leadership for review. The

leadership should approve the project budget according to the cost accounting plan and strictly limit the scope of project funds. It is necessary to analyze the part that exceeds the budget to ensure the efficiency of the construction funds of construction enterprises.

In general, the completion settlement is the key content of the follow-up control of the project. Although the project has been fully handed over, the project cost will still be affected and restricted by many factors. In view of this, the project construction unit should pay special attention to the audit work at the completion settlement stage, strictly implement laws and regulations and internal regulations, and take the strategy of comprehensive audit to carefully comb the entire as-built drawings. It should be noted that in this link, important personnel should not be transferred. The original site management personnel are the most familiar with the project, so they can participate in the completion settlement to improve the settlement information The integrity and authenticity of the guarantee. Third, in the process of purchasing engineering materials, we should strictly follow the material purchasing system of construction enterprises. Construction enterprises can define the procurement plan in combination with the cost budget scheme, and select the appropriate material suppliers by bidding method. Meanwhile, we should pay attention to the fluctuation of market price in the procurement process, and try our best to purchase construction materials with low transportation cost and high cost performance. Confirm the unit price and amount of materials again when signing the material purchase contract. In addition, environmental protection construction materials should be purchased as much as possible to reduce energy consumption in construction.

2.6 Referencing Trace Audit Policies

Compared with conventional audit work, tracking audit has certain particularity, the audit content involved is more comprehensive and systematic, and the actual implementation has timeliness. In subway construction projects, it is regarded as the most important project cost control strategy. Generally speaking, the introduction of follow-up audit has practical benefits, and its advantages are reflected in the following aspects: Firstly, it can provide guarantee for project management transformation and optimize function allocation. Second, as a third party supervision and audit, can strengthen the project supervision intensity, strict Review investment control loopholes; Third, auditors are highly involved in the project construction process, effectively breaking through the traditional working philosophy and mode, abandoning post-audit, and making up for the defects of unclear preliminary project review. Leaders in charge of project construction and grass-roots employees must be deeply aware of the importance of project cost management. Construction enterprises can organize a series of lectures and trainings on project cost management to help grass-roots employees and leaders understand the connotation, value and specific application of project cost management. What's more, in the exact construction stage, the construction unit should strengthen the publicity and education of cost control, so that every employee can deeply realize the value of cost management. For example, a construction enterprise can improve its employees' awareness of cost control by creating a good cost control atmosphere. In the closed-loop cost control system, many engineering costs are often calculated only after completion. This method of controlling only the cost afterwards has obvious lag. If the construction of the project changes in the design stage or construction stage, it will inevitably have an adverse impact on the overall cost.

3. CONCLUSION

To sum up, rail transit has become the infrastructure of modern city construction. The project cost control runs through the whole project construction process, which is helpful to improve the utilization rate of funds, save costs and maximize economic benefits. In summary, in the face of fierce market competition in the construction industry, construction enterprises can not only enhance their market core competitiveness, but also better promote the transformation and upgrading of Chinese construction enterprises by strengthening the cost control of engineering projects. Construction enterprises need to closely combine the dynamic characteristics of the market, apply advanced construction technology and scientific management system, so as to effectively improve the management effectiveness of enterprises. Enterprises should focus on project cost control, constantly optimize the output-return ratio according to the actual situation of the project, and promote the healthy and stable development of China's construction enterprises.

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