Research Status and Trends of Engineering Progress Optimization and Control Problems

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Abstract: The optimization and control of the project progress is the key to improving the economic efficiency of the company. This article discusses relevant issues and hopes to create more profits for the company, improve the construction management level of the company and ensure better project quality. After introducing the plans and measures adopted by modern society to optimize and control project progress, it is concluded that the trend of project progress optimization and control must be subordinate to the capital market, and management should be completely smooth and not out of touch.

Keywords: Engineering Progress, Optimization and Control, Problems Fix

1. INTRODUCTION

Because of the complex construction conditions, large scale, large number of involved professions, and wide range of involved projects, the project has the characteristics of strong practicality, complexity, diversity, risk, and discontinuity. Therefore, it is necessary to strengthen the schedule optimization and control of the project. Very important. The optimization and control of the project progress is a key part of the project management, directly related to the cost, duration, and quality of the project. Together with the investment control and quality control, it is called the three major control of the project, and is to ensure that the project is completed on schedule. Reasonable measures to rationally arrange resource supply and save engineering costs. Good project schedule control can be used to create an optimal schedule within a given schedule. During the execution of the plan, the construction schedule is checked regularly and compared with the schedule. If deviations occur, the cause of the deviation is analyzed. And the degree of impact on the schedule, modify the original schedule, so continue to cycle until the completion of the project acceptance. Therefore, strengthening research on the optimization and control of project schedules is of great significance to the owners, supervisors, or contractors. This article summarizes and analyzes the domestic and foreign research progress of the project progress optimization and control issues, and further clarifies the future research directions in the field of engineering progress optimization and control.

2. RESEARCH STATUS OF PROJECT PROGRESS OPTIMIZATION MANAGEMENT

The following measures can be taken to optimize the progress of the project: First, adapting to market development, improving the level and intensity of project management, and building high-quality, low-cost buildings are important strategic measures for promoting the development and implementation of corporate social responsibility. Second, adopting new technologies and new technologies and reducing construction waste, and objectively and rationally arranging construction and production are the guarantees for the efficient completion of project production. Third, we must organize human resources in a rational manner, grasp project management on one hand, and grasp teamwork in an all-round way to improve the overall quality of employees. Fourth, improve the construction system and achieve standard production. Fifth, effective management of project bids, strict project cost budgeting and management and control, and reducing production costs on the premise of ensuring project quality. Sixth, strengthen basic management and ensure project construction is carried out in an orderly manner. Seventh, beautify the construction environment and create a safe and civilized production site. First, optimize the progress control of the project to follow the three principles of standardization, scientific rationality and economic efficiency. The quality of the project is the foundation for the construction company to survive, improve employee participation, give full play to the main role of the staff, and optimize the allocation of people, people and things. This is the guarantee for efficient production of the project. Second, improve the management efficiency of project managers and managers. As the managed team members and their activities are all on the construction site, it is a reasonable and effective management method and should be the core of control project progress management. Eighth, high-quality, complete facilities and highly skilled construction teams can effectively control production investment and output [1].

3. RESEARCH STATUS OF PROJECT PROGRESS CONTROL

The research on the causes of the delays in the construction period has achieved research results and has been applied in the field of engineering project construction and has achieved good results. Abroad,

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SO Ogunlana took Thailand as an example to study the delay in construction progress in developing countries. The main reason can be attributed to the shortage or shortage of machinery and equipment, labor, and major raw materials. Various contracts are not rigorous. As a result, the relevant parties could not reach a consensus and the owner's reasons led to the inability of the project to continue [2]. Z. J. Herbsman and others studied the three elements of engineering, namely, the relationship between cost, progress, and quality, and believed that the above three relationships played a crucial role in the project. His research mainly discussed the impact of engineering delays on project quality and cost. The conclusion is that due to the unpredictable progress, there will inevitably be a phenomenon of grabbing work, and there will be hidden dangers in project quality, and the cost will also increase. NR Mansfield and others studied the progress and cost of construction projects in Nigeria. The results show that the most important factor affecting the progress is the funding issue, and also draws the same result as Ogunlana's study. Poor management, changes in site conditions and operating conditions, lack of timely supply of materials, and improper planning [3]. SA Assaf and others studied the risk factors affecting the progress of Saudi Arabia's large-scale construction projects, summarizing the issues including drawing approval, contractor's progress payment delays, funding issues during construction, design changes, and work between subcontractors. Major factors such as schedule conflicts. TM Mezher et al. conducted surveys and analysis of the causes of delays in Lebanon from the perspectives of the owners, contractors and architects. They found that the owners mainly considered funding issues, while the contractors paid the most attention to the contractual relationship. Engineers instead considered the project Management issues are the most important cause of progress. Domestic research in this area is very rare. The research on the factors of delays in construction period is often subjective and has few qualitative methods. Gao Hao analyzed the reasons for delays in the construction phase caused by the contractor's responsibility. The reasons include unreasonable progress control objectives, defects in the schedule, rework due to unqualified project quality, problems in the implementation of the schedule, and the impact of risks. Some scholars have also proposed the combination of system theory and risk theory, based on systematic theory of risk element transfer theory to identify the cause of the project schedule delay and the method of avoidance. For the study of control methods for determining the progress of projects, with the continuous advancement of science and technology and the deepening of research and application of artificial intelligence technologies, various new advanced algorithms such as Monte Carlo, genetic algorithm, fuzzy technology and neural network technology have been applied to the progress. Control research. For the case of uncertain project schedules, early research mainly used probabilistic statistical methods to determine the probability of occurrence of various influencing factors through mathematical statistics theory. Then, based on its influence on the duration, the probability of possible occurrence was calculated, among which PERT is typical. Probability schedule control method. In recent years, some new scientific theories and methods have been introduced into the project schedule control. Wu Weijun applied the chaos theory to the progress control research of water conservancy construction projects. By analyzing the problems in the progress control of water conservancy construction projects, he proposed the project schedule control based on initial sensitivity, butterfly effect, strange attractor and population model. Method. Some scholars have also applied the earned value theory to project progress and cost control to achieve joint control of schedule and cost, and conducted corresponding simulation studies. However, at present, there are many qualitative analysis in the study of project progress control in China. Most of the studies only put forward some specific countermeasures in combination with engineering practice, and have not achieved scientific prediction and dynamic control of project progress.

4. RESEARCH PROGRESS IN OPTIMIZATION AND CONTROL OF PROJECT PROGRESS

Domestic and foreign researches on the optimization and control of project progress are mainly focused on the following aspects: First, the optimization of the project schedule is mainly to consider the schedule optimization model under the constraints of cost, quality and other factors; second is the study of the control of the progress of the project, mainly Focuses on the study of schedule delays and schedule control methods. The study of delays in construction schedules is mostly based on the analysis of actual project cases. Progress control is mainly focused on deterministic situations. Research on the uncertainty of project schedules is still in the qualitative research stage. Future research trends in the optimization and control of project progress will mainly focus on the following aspects. At present, the research on the project schedule deviation mainly focuses on the study of the delay of the construction period. However, there is little research on the relationship between the early completion schedule and the quality target guarantee, and the project schedule deviation has not been fully analyzed and defined. The analysis of the factors affecting the progress of the project is mostly post-event qualitative analysis. It lacks reasonable estimates, predictions, and assessments of project schedule deviations. It is difficult to achieve corresponding management measures to ensure that the project project achieves the desired goals at the beginning of the project. At

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present, the study of the early warning mechanism for the project schedule deviation is not yet mature, and it should be considered as one of the research directions of the project schedule control. At present, the research on the optimization of project progress at home and abroad focuses on the optimization of both progress and cost. Its purpose is to find the optimal duration corresponding to the lowest cost of the project and the minimum cost of the project under the conditions of the specified duration. There is less research on how to achieve the optimization of the three elements of project management. When considering the mutual restriction of three factors, at present, only the relationship between two or two is often considered, and the system relationship has not been comprehensively analyzed yet, and the global optimization of the project progress cannot be achieved. However, some scholars have begun to study this issue and work hard to achieve the overall optimization of the project progress. Nowadays, the level of project management and the control of project progress are mainly reflected in the management of the construction site [4]. Strengthen the management of various compositional factors on the construction site to promote the healthy completion of the project. However, there is no fluent and uninterrupted management of the entire project from the overall and macro aspects of the project. The purpose of controlling and optimizing project schedule management is to improve the profitability of enterprises, expand the market share of enterprises, and improve the competitiveness of enterprises. Therefore, in the future development, the smooth and sound management of the entire project will be in line with the operating principles of the capital market, market-oriented, subject to market deployment, and achieve efficient macro management of the entire process. Under the general market environment, improving the production safety system, coordinating the relations among various production factors, improving the overall quality of the work force, and stricting the project planning, does not violate laws and regulations, and ensuring good project quality is a magic weapon for the healthy development of construction companies [5].

5 CONCLUSION

Since China's reform and opening up, both the economic development and the technological level have been advancing at a rapid pace. At the same time, the corresponding management issues have also kept pace with the times and have in turn promoted the development of economy and technology. In today's construction industry, effective implementation of construction site management, optimization and control of project progress is a key factor in improving the economic efficiency of enterprises and increasing the market competitiveness of enterprises; at the same time, it also helps to improve the overall capacity of construction teams.

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