Effective Strategies for Enhancing Construction Technology Management Levels in Building Engineering

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Abstract: This paper focuses on enhancing the management level of construction technology in building engineering. It first elaborates on the importance of construction technology management, then analyzes the existing problems in current construction technology management. Finally, effective improvement strategies are proposed from multiple dimensions, including strengthening personnel training and management, improving technical management mechanisms, and promoting the application of information technology. The aim is to provide useful references for elevating the management level of construction technology in building engineering.

1. Introduction

As a crucial component of social infrastructure construction, the quality of building engineering directly impacts people's quality of life and societal development. During the construction process, construction technology management plays a vital role. Effective construction technology management ensures the successful completion of projects according to design requirements and quality standards, thereby improving the economic and social benefits of the project. However, numerous problems still exist in current construction technology management, hindering the development of building engineering. Therefore, in-depth exploration of effective strategies to enhance the management level of construction technology in building engineering holds significant practical importance.

2. The Importance of Construction Technology Management in Building Engineering

2.1 Ensuring Project Quality

Project quality is the core lifeline of building engineering, directly affecting the functionality and lifespan of structures. Construction technology management, by formulating scientific and appropriate construction plans and clarifying construction processes and quality standards for each process, provides a solid technical foundation for project quality. During the construction phase, strict technical management requires construction personnel to operate according to established specifications and standards, rigorously checks the quality of raw materials and components to ensure compliance with design requirements, and utilizes effective quality inspection and monitoring methods to promptly identify and address quality errors during construction, eliminating potential quality hazards at the initial stage[1].

2.2 Controlling Project Costs

Cost control is one of the core objectives of building engineering project management. Construction technology management plays a significant role in controlling project costs. By optimizing construction plans, properly allocating resources, and improving labor productivity and equipment utilization efficiency, direct costs during construction can be reduced. Adopting advanced construction technologies and processes can minimize construction steps and duration, thereby reducing labor and machinery expenses[2]. Strict technical management can prevent rework and repairs caused by quality issues, reducing unnecessary material waste and cost increases. Through real-time monitoring and analysis of costs during the construction process, cost deviations

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can be quickly identified and appropriate corrective actions taken, effectively managing project costs and enhancing the project's economic benefits.

2.3 Ensuring Project Schedule

The project schedule is key to the timely delivery and use of building engineering projects. Construction technology management, by developing reasonable construction schedule plans and defining tasks and milestones for each stage, provides strong support for schedule control. During actual construction, the schedule plan is promptly adjusted based on actual conditions, coordinating the sequence and collaboration of various trades to ensure continuity and harmony in the construction process. Effective technical measures address technical difficulties encountered during construction, preventing delays caused by technical problems. When encountering complex geological conditions, suitable foundation treatment methods ensure smooth foundation construction, thus avoiding hindrances to the overall project progress.

2.4 Ensuring Construction Safety

Construction safety is a critical aspect of the building engineering construction phase. Construction technology management, by establishing sound safety technical measures and operating procedures, creates a safe and reliable construction site for workers. Safety technical briefings are provided to ensure workers are aware of risks and preventive measures. During construction activities, emphasis is placed on safety inspections and supervision at the site to promptly identify and eliminate potential hazards. Utilizing advanced safety technologies and equipment enhances the safety level of the construction process. For instance, employing secure protective facilities and operating platforms during work at height can effectively prevent falls.

3. Analysis of Existing Problems in Current Construction Technology Management for Building Engineering

3.1 Uneven Quality of Management Personnel

Construction technology management places extremely high demands on the professional quality and comprehensive abilities of management personnel. The variation in the quality of management personnel within the industry is significant. Some managers lack systematic professional knowledge and practical experience, have an insufficient understanding of construction techniques and technical specifications, and struggle to propose effective solutions when facing complex technical problems[3]. Some personnel engaged in management have theoretical knowledge but lack practical on-site management experience, unable to closely integrate theory with practice, leading to errors in construction organization and technical guidance. Some managers have a weak sense of responsibility and a performing work attitude, resulting in potential technical hazards not being identified and addressed promptly, posing significant risks to project quality and safety.

3.2 Inadequate Technical Management Mechanisms

A sound technical management mechanism is the foundation for ensuring the smooth execution of construction technology management. Technical management mechanisms in many building engineering projects show significant flaws. The technical management system has loopholes, lacking clear technical management processes and standard definitions, leading to blurred departmental responsibilities, poor coordination, and chaotic technical management practices in actual work. During the technical disclosure phase, the absence of unified standards and specifications leads to differing understandings of the content and requirements among individuals, causing construction personnel to have an unclear grasp of technical and quality requirements. The supervision mechanism for technical management is not implemented effectively; monitoring and assessment of the technical management process are inadequate, failing to promptly detect and correct violations in technical management. Consequently, some technical issues cannot be effectively resolved, affecting project progress and quality.

3.3 Low Level of Information Technology Application

With the rapid development of information technology, the application of IT means in construction management is becoming increasingly widespread. However, currently, the level of IT application in construction technology management for building engineering remains relatively low. Many enterprises still use traditional management methods, such as paper-based document transmission and manual data recording, which are inefficient and prone to information transmission errors and losses[4]. In terms of technical data management, the lack of a unified information management platform leads to dispersed technical data, preventing sharing and efficient utilization. The application and popularization of advanced digital technologies, such as Building Information Modeling (BIM) and big data analytics, in construction technology management are not high, failing to fully leverage the advantages of these technologies in optimizing construction plans, improving construction efficiency, and enhancing quality.

3.4 Insufficient Technological Innovation

In the current era of rapid technological advancement, technological innovation is the core driving force leading the progress of the building engineering industry. Technological innovation in construction technology is clearly inadequate. Enterprises do not place sufficient emphasis on technological innovation, lacking investment in technology research and development, leading to lagging development and application of new technologies, processes, and materials. A strong atmosphere for technological innovation has not been formed within the industry; there is a lack of technical exchange and cooperation between enterprises, making it difficult to pool collective strength for innovation. The mechanisms for cultivating and introducing technical talent are imperfect, and there is a shortage of high-quality technical personnel with innovative spirit and capability, which also constrains the innovative progress of construction technology in building engineering.

4. Strategies for Effectively Enhancing the Management Level of Construction Technology in Building Engineering

4.1 Strengthen Personnel Training and Management

4.1.1 Conduct Professional Training

Construction enterprises should periodically organize technical management personnel to participate in professional training, inviting industry experts to teach new technologies, new construction processes, new standards, etc., to enhance the professional knowledge and skill levels of managers. Encourage managers to pursue continuing education and professional qualification exams to continuously improve their comprehensive quality[5].

4.1.2 Strengthen Professional Ethics Education

Through professional ethics education activities, cultivate a sense of responsibility and professionalism among technical management personnel, helping them establish correct work attitudes and values. Require managers to strictly adhere to relevant technical management rules and regulations, conscientiously perform their duties, and ensure the quality and performance of technical management work.

4.2.3 Establish Talent Incentive Mechanisms

Build scientific and appropriate talent incentive methods, providing material rewards and spiritual recognition to technical managers who perform well, thereby motivating their enthusiasm and creativity. Offer good career development opportunities and promotion prospects to attract and retain excellent technical management talent.

4.2 Improve Technical Management Mechanisms

4.2.1 Clarify Division of Responsibilities

Construction enterprises should establish sound technical management organizational structures, clearly defining the responsibilities of various departments and personnel in technical management. Create a hierarchical and clearly responsible technical management system. Establish technical supervisor positions responsible for overall planning and coordination of technical management work. Add professional technical personnel positions responsible for specific tasks like technical plan preparation and technical disclosure[6].

4.2.2 Standardize Work Processes

Develop scientific and appropriate technical management workflows, clarifying each step and operational procedure to ensure technical management work proceeds step-by-step. For example, during construction drawing reviews, specify the time, participants, and scope, and promptly feed back the review records to the design unit.

4.2.3 Enhance Communication and Coordination

Establish effective communication and coordination mechanisms to improve information exchange and collaborative cooperation between departments. Hold regular meetings related to technical management work to address existing problems promptly. Strengthen communication and coordination with external units such as the construction unit, design unit, and supervision unit to achieve good working synergy[7].

4.2.4 Improve Supervision and Assessment Mechanisms

Build a complete technical management supervision and assessment system. Conduct regular inspections and evaluations of technical management work. Establish detailed assessment indicators and scoring standards to quantitatively evaluate the work performance of managers. Based on assessment results, reward outstanding performers and penalize incompetent managers, ensuring the solid implementation of technical management work.

4.3 Promote the Application of Information Technology

4.3.1 Establish an Information Management System

Construction enterprises should actively introduce advanced information technologies and build an information system for construction technology management. This system should include functions such as construction drawing management, technical plan drafting, technical disclosure, construction process supervision, and quality inspection, enabling informatization, digitization, and intelligence of technical management. Through a drawing management system, online viewing, modification, and approval of drawings can be achieved, improving the efficiency and accuracy of drawing management.

4.3.2 Promote the Application of BIM Technology

BIM technology is an information management method for building engineering that uses 3D digital technology. Construction enterprises should actively promote and apply BIM technology, establishing BIM models during project planning, design, construction, and operation stages to enable engineering information sharing and collaborative work. Using BIM technology, tasks like construction simulation, clash detection, and schedule optimization can be performed, identifying and resolving potential problems in advance, thereby improving construction quality and efficiency.

4.3.3 Strengthen Data Management and Analysis

Use information methods to collect, organize, and analyze various data generated during the construction process, providing effective basis for technical management decision-making. By analyzing construction progress data, schedule deviations can be promptly identified and adjustment measures taken. Through the analysis of quality inspection data, patterns and causes behind quality problems can be found, allowing for targeted preventive measures[8].

4.4 Encourage Technological Innovation

4.4.1 Establish Technological Innovation Incentive Mechanisms

Construction enterprises should set up a technological innovation incentive mechanism to reward teams and individuals who achieve remarkable results in innovation, encouraging technical personnel to actively engage in innovation activities and propose new construction technologies and process schemes. Establish special innovation reward funds to reward personnel who obtain patents, construction methods, and other technical achievements.

4.4.2 Strengthen Industry-University-Research Cooperation

Enhance cooperation levels with scientific research institutions and universities, building industry-university-research collaboration platforms to jointly conduct research and application of new technologies and processes. Through such cooperation, the talent and technological advantages of research institutions and universities can be fully utilized, providing technical support and innovation vitality for enterprises. For example, collaborate with universities on research into prefabricated construction technology to promote its application in engineering projects.

4.4.3 Promote the Application of New Technologies and Processes

Actively monitor industry trends, promptly introduce, and promote the application of new technologies and processes. During project implementation, encourage technical personnel to try new construction technologies and processes to enhance construction efficiency and quality. Promote and apply technologies like 3D printing and smart construction to bring new advancements to building engineering construction.

5. Conclusion

In summary, effectively enhancing the management level of construction technology in building engineering is highly significant for ensuring project quality and schedule. Currently, numerous problems exist in construction technology management. Adopting measures such as strengthening personnel training and management, optimizing technical management mechanisms, promoting the application of information technology, and encouraging technological innovation can significantly improve the capability of construction technology management. Construction enterprises need to fully recognize the critical importance of technical management, actively take effective measures, and continuously enhance the level of technical management to promote the development of the building engineering industry.

References

[1] Fan Cheng. Exploring Effective Strategies for Enhancing Construction Technology Management Levels in Building Engineering [J]. Value Engineering, 2025, 44(22): 154-156.

[2] Dou Rumeng, Shi Xiangyu. Strategies for Enhancing Construction Technology Management Levels in Building Engineering [J]. Housing and Real Estate, 2025(14): 105-107.

[3] Wang Le, Ding Bo, Liu Dongmei. Exploration of Effective Strategies for Enhancing Construction Technology Management Levels in Building Engineering [J]. Construction and Budget, 2024(10): 7-9.

[4] Li Guodong. Research on Effective Strategies for Improving Construction Technology Management Levels in Building Engineering [J]. Housing and Real Estate, 2024(23): 113-115.

[5] Jian Qianqian, Li Chengqing. Exploration of Effective Strategies for Enhancing Construction Technology Management Levels in Building Engineering [J]. Construction & Design for Engineering, 2024(13): 259-261.

[6] Ding Jiangyong, Tang Wei, Xing Chao, Lei Yao, Chen Jingjia. Discussion on Effective Strategies for Enhancing Construction Technology Management Levels in Building Engineering [J].

Urbanism and Architecture, 2022(S1): 155-157.

[7] Zhang Yuhong. Effective Strategies for Enhancing Construction Technology Management Levels [J]. Ju Ye, 2022(6): 155-157.

[8] Zhang Qiuping. Strategies for Effectively Enhancing Construction Technology Management Levels in Building Engineering [J]. China Building Decoration & Renovation, 2022(2):183-184.