

# Influencing Factors of Quality Innovation in Construction Enterprises

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**Abstract:** In today's highly competitive and rapidly changing environment, China's urban construction is gradually moving from the "incremental market" to the "stock market" era, and China's economy has shifted from the high-speed growth stage to the high-quality development stage. Under the new situation, it is difficult for the construction industry to rely on the traditional development model of rapid expansion of scale, and the development of the industry is facing unprecedented opportunities and challenges. Therefore, in the context of quality era, quality innovation has become the key to promote the sustainable development of construction enterprises. Based on combing relevant literature of experts and scholars, this paper takes construction enterprises as the research object, refines four influencing factors of quality innovation of construction enterprises: technical factors, human resources, digitalization and government policies, and puts forward corresponding improvement strategies. Construction enterprises should pay attention to various influencing factors of quality innovation, in order to provide references for improving how construction enterprises build professional advantages, transformation and upgrading, and achieve healthy and sustainable development.

**Keywords:** Quality Innovation; Influencing Factors; Construction Enterprises

## 1. Introduction

Innovation is the first driving force for development [1], and high-quality innovation drives high-quality development has become an inevitable trend of China's development. For the present stage of China's construction, only the increase in the number of innovations

can no longer meet the needs of the current development of the enterprise market, and the quality innovation of enterprises must be improved [2]. China's construction industry is in a critical period of green, intelligent and management modernization transformation. The state and government attach great importance to the development of quality innovation of construction enterprises, and have introduced a series of policies and measures to encourage enterprises to invest in innovation and improve the level of innovation [3]. Construction enterprises also pay more attention to the development of quality innovation, but there are still a series of problems, such as technical bottlenecks in the innovation process, slow technology development, insufficient human resources, lack of professional innovation personnel, low conversion rate of research and development innovation results, insufficient research and development capital, financing difficulties. Therefore, it is particularly important and urgent to deeply study the quality innovation of construction enterprises and enhance the innovation ability of enterprises under the requirements of today's high-quality development. The quality innovation of construction enterprises is affected by many factors. This paper explores the influencing factors of quality innovation of construction enterprises to enrich the relevant researches on quality innovation of construction enterprises, so as to provide reference for the driving development of construction enterprises.

## 2. Status Quo of Influencing Factors of Quality Innovation in Construction Enterprises

As a national pillar industry, the construction industry has made great contributions to reducing employment pressure, promoting economic growth and improving people's lives.

In recent years, the construction industry has experienced a decline in labor productivity and a slight increase in production. In the context of high-quality development, construction enterprises should shift from the crude production mode to the fine, quality and efficiency mode, and then realize the high-quality development of the construction industry, and it is urgent to shift from quantitative innovation to quality innovation, so as to break away from the innovation trap of "heavy quantity, light quality". Cong et al. [4] found that increasing the quantity of enterprise innovation output and improving enterprise human capital promoted enterprises' high-quality innovation. Yang et al. [5] found that innovation incentive policies effectively improve the quality of enterprise innovation; Ma et al. [6] found that enterprise innovation is affected by technological innovation, organization, environment and other factors. Technological innovation of enterprise products and processes is used to improve the level of enterprise innovation, senior management encourages enterprise innovation, and government supports and encourages enterprise innovation. Li et al. [7] found through necessary condition analysis and fuzzy set qualitative comparative analysis that innovative human resources, technological innovation, policy subsidies, market environment and other factors are influencing factors of enterprise quality innovation.

### **3. Influencing Factors of Quality Innovation of Construction Enterprises**

In today's environment, quality innovation has become a key factor to promote the high-quality development of enterprises. Quality innovation not only includes technology and product innovation, but also talent, digitalization and government support have an impact on quality innovation. Therefore, the following will be a comprehensive analysis of the various factors that affect the quality innovation of construction enterprises.

#### **3.1. Technological Innovation**

Technological innovation is the key driving force for quality innovation of construction enterprises [7]. Construction enterprises accelerate technological innovation, strengthen technological innovation in the quality,

schedule and safety of construction projects, form a high-quality, low-energy, low-emission construction form, and promote the construction enterprises to achieve high-quality development. With the improvement of technical capabilities of construction enterprises, they have stronger competitive advantages in market competition, and occupy favorable advantages in choosing partners, improve their core technology level, and improve their innovation ability. When construction enterprises continue to break through key technologies in a certain field, solve technical bottlenecks, and realize mutual promotion and complementary advantages among technologies, occupy technical heights in competition and obtain sustainable competitive advantages [8,9], improve the rate of economic added value of enterprises, and promote the improvement of the quality of enterprise development [10]. Through technological innovation, improve product technical content, improve product performance, reduce unnecessary links, reduce input costs, improve product quality, improve product stability and reliability, achieve high-quality development, and then promote the improvement of enterprise quality innovation; Technological innovation helps construction enterprises achieve production efficiency, reduce innovation costs, improve management efficiency, improve quality levels, optimize resource allocation, and provide enterprises with more resources and funds for quality innovation.

#### **3.2. Human Resources**

Human resource is the decisive factor to improve the quality innovation of construction enterprises. According to the resource-based theory and human capital theory, the unique heterogeneous resources of enterprises are more conducive to the establishment of competitive advantages [11]. In the current complex economic environment, talents with certain experience and knowledge can better identify the external environment and quickly grasp the internal and external resource allocation of the enterprise, and tap the innovation potential to promote the process of enterprise quality innovation. Human resources have certain initiative and creativity. By increasing human resources and reasonable talent allocation, knowledge flow and

absorption can be accelerated, innovation discovery rate can be improved, and innovation ability of employees can be stimulated, which can bring innovation benefits to construction enterprises and promote quality innovation of construction enterprises [12,13]. Human resource is the knowledge carrier of construction enterprises. The accumulation of human capital can promote the acquisition, absorption and application of industrial knowledge, thus laying a solid foundation for high-quality innovation of enterprises.

### 3.3. Digital Development

Digitalization is the process of driving innovation and growth in all aspects of construction economy and society based on digital technology. With the vigorous development of digitalization, the development of digital economy promotes the improvement of quality innovation ability of construction enterprises [14]. At present, "digital economy" has become an important driving force for the high-quality development of China's economy [15]. The rapid development of digitalization provides more innovation resources for construction enterprises, promotes the quality management of construction enterprises and promotes the improvement of quality innovation of enterprises [16]. The digital economy can provide digital finance for construction enterprises, provide financial support for enterprises to carry out innovative activities, and guarantee the continuous research and development and innovation of enterprises. The digital platform can better integrate resources within the organization, improve the practical innovation ability of construction enterprises, let enterprises know more about relevant technical products, and improve the quality innovation of the whole process and the whole cycle of construction [17]. Construction enterprises use BIM, digital management, remote monitoring and other digital technologies for construction, and model design drives construction progress through digitalization, making management more refined, quality control more accurate, promoting construction intelligent upgrading, and improving the high-quality development of construction enterprises. The application of digital technology can help enterprises further tap the potential innovation value of existing

resources, break through the limitations of original technologies, increase the number of patents in the vacant part of the field, and thus improve the innovation quality of enterprises [3].

### 3.4. Government Policy

The quality innovation of construction enterprises cannot be separated from the guidance of government policies. Government support is conducive to high-quality innovation of enterprises, and the investment of scientific and technological resources under the guidance of government policies enhances the innovation ability [18]. In terms of supporting enterprises' high-quality innovation, the government provides important support for the high-quality development of construction enterprises by providing policy subsidies and optimizing the quality innovation environment, and helps enterprises to face the uncertainty and financing constraints of quality innovation activities. Government subsidy policy, as an effective means to encourage enterprise innovation, has a direct impact on enterprise innovation activities, whether it is direct government subsidy or tax incentive [19,20], which can not only increase internal and external financing of enterprises, improve the motivation and ability of R&D and innovation of enterprises, but also encourage enterprises to take more innovation risks, ultimately promote the growth of enterprise innovation performance. Enterprise quality innovation requires a lot of resources, and R&D cost includes not only the actual investment of people, property and other resources, but also the opportunity cost of these resources. Enterprise innovation is an activity with high risks, and government subsidies can effectively reduce the R&D cost of enterprises, reduce the risk of R&D decision-making, change the cost-benefit ratio, and improve the return rate of enterprise innovation. Thus, enterprises are stimulated to increase R&D investment and carry out R&D quality innovation [21].

## 4. Strategies for Improving the Quality Innovation of Construction Enterprises

(1) Strengthen the technological innovation of construction enterprises

In terms of technological innovation of construction enterprises, accelerate the process of breaking through key technologies of

enterprises [22], improve the level of technological innovation of construction enterprises, promote the establishment of cooperative partnership between construction enterprises and scientific research institutions, and jointly solve technical bottlenecks; Establish a technical team with innovative ability, cultivate talents with technical ability, make full use of the existing technical resources of the enterprise, deepen the competition mechanism [23], and enhance the spirit of technical innovation of technical personnel; According to the technical development direction of construction enterprises, timely formulate development goals, create research and development funds, so that technical personnel can concentrate on technological innovation, obtain first-hand experience and data, in order to form the independent knowledge and technology of enterprises.

(2) Strengthen the construction of human resources in construction enterprises

In terms of human resources, the innovation ability of outstanding talents is the source of quality innovation competitive advantage for construction enterprises [24]. With the promotion of innovative human resources, enterprise structure is adjusted and the driving force of quality innovation for construction enterprises is enhanced [25]. Therefore, increase the investment in human resource costs, actively introduce innovative talents, vigorously train high-quality innovative talents, and establish innovative research and development teams. Construction enterprises should improve the policy of talent introduction, improve the integrated allocation of human resources, give play to the driving force of innovative talents to drive the quality development of enterprises, and provide enterprises with more and more quality innovation power, and create a steady stream of quality innovation results for construction enterprises.

(3) Further promote the digital construction of construction enterprises

Digitization can promote the quality innovation efficiency of construction enterprises and improve the power of innovation efficiency. Strengthen construction enterprises to promote digital construction, orderly promote digital technology construction, improve quality and innovation

resource allocation; Construction enterprises should focus on digital technology in construction, quality management and other links, strengthen the training of digital talents, improve efficiency, and promote enterprises to innovate digital development strategies. Expand the depth and breadth of digital development, explore the organic combination of quality innovation activities and digitalization of construction enterprises, promote the penetration of digital technology into the whole process of construction projects, and promote digital development to drive high-quality development of enterprises [26].

(4) Strengthen government policies to support enterprise quality innovation

The government should provide accurate policy support to construction enterprises according to the actual situation [27]. The quality innovation of construction enterprises is subject to various influences of enterprises themselves and external environment, and the influencing factors are complex and changeable. Only by paying real-time attention to construction enterprises can we provide timely help to enterprises. When construction enterprises are faced with funding difficulties and financing difficulties in innovation research and development, the government can adopt policies such as government subsidies after comprehensive consideration of the current situation of enterprises to drive construction enterprises to re-invest in quality innovation [28].

## 5. Conclusion

In a volatile and uncertain environment, based on the research in this article, it is helpful to improve the influencing factors of quality innovation in construction enterprises, comprehensively analyze the key factors that affect quality innovation in construction enterprises, such as technological innovation, human resources, digitalization, and government policies, and propose strategic analysis for quality innovation in construction enterprises, which has certain theoretical value.

According to the research conclusions, some enlightenments are drawn, construction enterprises should speed up the process of technological innovation, technological innovation is the key factor to drive product innovation and improve product quality,

improve the production speed of enterprises, and promote the improvement of enterprise quality; Construction enterprises should pay attention to the promotion of human resources, attract more excellent innovative technical talents, strengthen the training of employees, in order to achieve the goal of enterprise quality innovation; Construction enterprises should make reasonable use of the advantages brought by digital technology to quality innovation, so as to master more favorable technologies and lay the foundation for improving the quality innovation of construction enterprises. Government departments should formulate relevant policies to support quality innovation of construction enterprises, such as government subsidies, tax incentives, etc., to encourage high-quality development of construction enterprises.

In this paper, there are still some problems in the study of the factors affecting the quality innovation of construction enterprises, such as: First, the discussion between the various influencing factors of construction enterprises. This paper only examines the individual influencing factors of construction enterprises, ignoring the potential connection of each influencing factor. It will further explore the influence of the interaction between factors on the quality innovation of construction enterprises, which will help deepen the understanding of quality innovation.

Second, no investigation was conducted on the changes in influencing factors under construction enterprises. This paper finds out the influencing factors of quality innovation of construction enterprises from the research of researchers, but does not pay attention to the influence of factor changes on quality innovation of construction enterprises. The research on the dynamic change of influencing factors and the degree of influence on the quality innovation of construction enterprises has become the direction of future research.

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