

Investigating The Impactful Pathway Of High-Performance Work Systems On Employees' Breakthrough Innovation Behavior

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Abstract

A high-performance work system is a corporate work practice framework rooted in the open innovation model. Serving as a pivotal driver, it enables organizations to actively engage in knowledge search, acquire external knowledge, facilitate knowledge diffusion, promote knowledge innovation, and ultimately achieve breakthrough innovations. Aligned with the national strategic goal of innovation-driven development, radical innovation is recognized as the core force for developing countries to transition from factor-driven and investment-driven models to innovation-driven and knowledge-driven approaches.

For enterprises, achieving breakthrough innovation is imperative for connotative growth. Consequently, this study delves into the mechanisms and influence pathways of a high-performance work system in promoting employees' radical innovation behavior. The structural equation model of a high-performance work system is employed to explore this relationship. The findings indicate a significant positive impact of the high-performance work system on employees' radical innovation behavior, with knowledge absorption and diffusion playing mediating roles. In light of these results, the study recommends that enterprises can foster employees' creative thinking and innovation abilities by establishing a high-performance work system. This approach facilitates technological and knowledge breakthrough innovations, ensuring the sustainable development of enterprises.

Keywords: high performance work system, openness and innovation, knowledge flow, employee breakthrough innovation behavior

1. Introduction

With the rapid development of economic globalization and knowledge-based economy, modern enterprises are faced with the unknown changes of economic market and the huge impact of different industries. How to enhance the core competitiveness of enterprises and realize the sustainable development of enterprises is an urgent problem for contemporary enterprises to solve. The key factor of sustainable development of enterprises is innovation, especially the breakthrough technology innovation, so that enterprises can survive and develop in the fierce market competition. The 18th National Congress of the Communist Party of China put forward the innovation-driven development strategy. In this context, radical innovation is regarded as the key for developing countries to realize leapfrog catch-up, the transformation from factor driven and investment driven to innovation driven and knowledge driven, and the realization of concursive growth. Therefore, how to achieve technological and knowledge breakthrough innovation, among which the innovation ability of enterprise employees is the key. Innovation and development of enterprises are closely related to innovative talents, and the acquisition of innovative talents depends on the cultivation of employees' innovative ability.

Through the review of existing literature, the research content of influencing employee innovation behavior mainly focuses on three aspects: employee motivation, knowledge sharing and external resources, but there are few researches on employee radical innovation from the perspective of two-way knowledge flow, subject diversification and form diversification of open innovation. Drummond et al. found that high performance work system, as an effective carrier of open innovation, can effectively penetrate knowledge to the boundaries of enterprises, form knowledge innovation network, and effectively improve employees' knowledge, skills and abilities, stimulate their innovation enthusiasm, enhance their sense of belonging, and encourage them to contribute to the organization. Therefore, open innovation is an important innovation paradigm for key core technology breakthroughs. Therefore, how to implement open innovation and promote radical innovation of employees is an important issue to be solved urgently.

Therefore, based on the perspective of open innovation, this paper tries to explore the influence path of high performance work system on employees' radical innovation behavior. It provides a new theoretical perspective to deeply understand and explore the internal action mechanism of high performance work system on employees' radical innovation behavior. At the same time, this study provides theoretical support for modern enterprises to break through the bottleneck of enterprise development, promote enterprise scientific research and innovation ability and stimulate employees to break through innovation behavior, so this study has theoretical and practical value.

2. Literature Review and Research Hypothesis

Definition of Key Concepts Open Innovation

Harvard Business School professor Henry Chesbrough proposed the concept of open innovation for the first time at the enterprise level, and defined it as an innovation mode in which an enterprise purposefully utilizes the inflow and outflow of knowledge to accelerate its internal innovation and expand its external market scope. Henry Chesbrough believes that many seemingly creative enterprises adopt a closed mode for innovation, which results in many inventions being put on the shelf due to the limitation of their own ability and unable to gain benefits from innovation. Therefore, enterprises need to change the closed mode and carry out innovation activities under the open innovation mode. Compared with the traditional closed innovation mode, open innovation is more inclusive and open, and can more effectively combine the internal and external innovation resources, implement innovation through internal and external market channels, and finally transform the innovation results into commercial profits. Therefore, open innovation mode can better adapt to the requirements of the development of digital and information technology in today's enterprises, and therefore has unique advantages. In the mode of open innovation, the boundaries of enterprises are permeable, and knowledge can penetrate into the boundaries of enterprises, so that enterprises can freely transfer with external resources. That is, external knowledge can flow into enterprises through the boundaries, and enterprises can also transfer their technologies to the outside through technology licensing and technology transfer. WESG et al. believe that open innovation is a cognitive mode and an innovative practice of knowledge innovation and transformation into research. Studies of Piller et al. show that from the perspective of open innovation, enterprises acquire knowledge from customers and partners and reintegrate knowledge to generate new ideas, which are finally reflected in product and service innovation. Hastbacka believes that open innovation means that enterprises spread internal frontier knowledge to the outside through social networks, and integrate external technology, creativity and other resources into the inside for project development, product production and promotion and application of innovative results. Lichtenthaler defined open innovation as an enterprise's knowledge search, memory and innovation through the blurring of enterprise boundaries in the process of innovation practice. Yang Jingwu's research shows that, based on the open innovation mode, the innovation ability of enterprises can be divided into absorption capacity, conversion capacity, diffusion capacity and other aspects. Chen Jin et al. found that open innovation is a diversified innovation, including a variety of innovative elements. Su Yong et al. showed that from the perspective of open innovation, innovation is no longer a simple and linear process, but a process in which innovation elements interact with each other to form a complex feedback mechanism. Therefore, the establishment of open innovation support system is a necessary condition to ensure enterprise innovation. Therefore, this study refers to Chesbrough's definition and defines open innovation as an innovation mode in which enterprises purposefully utilize knowledge flow, integrate internal and external innovation resources and commercial resources, and finally realize knowledge innovation through the absorption and diffusion of external knowledge. The support system of open innovation is realized through the construction of high performance work system.

High Performance Work System

As for the definition of high performance work system, the academic circle has a broad and narrow distinction. In a broad sense, the high performance work system is the combination and optimization of various resources (such as human resources, technology and organizational structure) in the organization to meet the market and customer preferences, and finally make the enterprise achieve a higher level of performance. From a narrow point of view, high performance practice work system is a collection of various HRM practice activities (such as recruitment and allocation, training and development, performance pay, etc.), which ensures the sum of a series of activities and policies that HRM serves the strategic goals of enterprises. At present, the narrow definition is the most widely used. Lepak et al. believe that high performance work system, as an effective carrier of external support, provides employees with rich and valuable resources to meet their basic psychological needs and stimulate their innovation vitality, which mainly includes three contents: skill enhancement practice, motivation enhancement practice and opportunity enhancement practice. Liu Shanshi et al. divided the high performance work practice system into four categories: skill development practice, employee incentive practice, empowerment and participation practice and communication practice. Therefore, this study refers to Lepak et al., Liu Shanshi et al., and divides high performance work system into four dimensions: skill enhancement practice, motivation enhancement practice, opportunity enhancement practice, and communication enhancement practice. Among them, the skills upgrading practice mainly enables employees to acquire more knowledge, experience and skills through the practice of recruitment, internal training and development mode, which is conducive to the cultivation of divergent thinking and knowledge transformation. Motivational promotion practices mainly include innovative performance incentive, profit sharing based on organizational goals and other incentive human resources practices. The organization attaches importance to the innovation, contribution and welfare of employees, which will make employees have emotional belonging and stimulate their creativity. Based on the realization

of the practice of skill upgrading and motivation upgrading, the organization provides employees with job opportunities, including the practice of information sharing, encouraging employees to participate in management and allowing employees to express their opinions, which creates an atmosphere of autonomy for employees, which is conducive to the "breeding" of employees' creativity. Communication promotion practice is a communication platform that enterprises build for employees, including social network, communication channels with partners and other peers, and encourages employees to absorb, spread and innovate knowledge through learning, communication and communication.

Employees' Breakthrough Innovation Behavior

Radical innovation was first proposed by Schumpeter and defined as the long-term fluctuation of technological change and innovation disruption caused by new technology and new skills, which creates or redefines the enterprise and the existing market. With the changing context of The Times, scholars have developed a more comprehensive explanation of radical innovation. Tang et al. believe that knowledge sharing can promote the diversity of employees' knowledge and affect the breakthrough creativity of R&D teams. Han Chen et al. defined it as an innovation mode in which an enterprise breaks the old technology and production process of old products, and then finds, researches and puts it into use to make the enterprise have a competitive advantage. Breakthrough innovation and conventional incremental innovation show different characteristics, its success has greater uncertainty and risk, but also requires employees to invest more energy, intelligence and endurance. Amabile proposed that employees' breakthrough innovation comes from intrinsic motivation. If employees love their work and have strong intrinsic motivation to try and take risks, they can stimulate their breakthrough creativity. Therefore, this study defines the radical innovation behavior of employees as the innovation that the enterprise makes a subversive transformation to the product, production mode, market or industry.

Knowledge Flow

The open innovation theory holds that the openness of innovation subjects is the primary condition to improve the innovation performance of enterprises, and knowledge flow is the essence of the open communication of innovation subjects. As knowledge is the core element of innovation, the absorption, utilization, transfer and diffusion of knowledge have become the key links affecting innovation. Therefore, this study takes the direction of knowledge flow as the standard and divides it into two dimensions: knowledge absorption and knowledge diffusion.

Knowledge Absorption

Knowledge absorption refers to the process of knowledge acquisition, internalization, absorption and utilization, which is the exploratory learning of external knowledge sources. On the one hand, knowledge absorption is the leading factor for innovation subjects to increase the breadth and depth of knowledge, expand and deepen the knowledge base, and enhance the capital of innovation cooperation. On the other hand, because subjects with strong knowledge absorption ability are more likely to establish knowledge connections with the outside world, knowledge absorption also becomes the main clue for innovation subjects to find industry-university-research partners and realize efficient collaborative innovation.

Knowledge Distribution

Enterprises' innovation is not only influenced by their own knowledge stock, but also improved by external knowledge acquisition. Therefore, knowledge diffusion is considered to be the key factor for enterprises to innovate and enhance their core competitiveness. Inkpen et al. believe that knowledge diffusion is a knowledge flow mechanism within an organization, and its existence ensures knowledge sharing and organizational identity among members with compatible knowledge structures and cultural backgrounds. Davenport et al. believe that knowledge diffusion is the process of knowledge transmission between individuals and organizations, and the organic unity of knowledge transfer and knowledge absorption. Li Li et al. believe that knowledge diffusion is the process of realizing knowledge sharing among different individuals through the spread of scientific and technological knowledge information across time and space. Therefore, this study draws on Chen Jin et al., Davenport et al., and defines knowledge absorption as the process of knowledge acquisition, internalization, absorption and utilization by organizations, while knowledge diffusion is defined as the process of knowledge transmission between individuals and organizations, which is the organic unity of knowledge transfer and knowledge absorption.

Research Hypothesis

The Relationship Between High Performance Work System and Employees' Breakthrough Innovation Behavior

High performance work system is the most effective work system for modern organization to improve employee performance. The system improves the practical ability of employees in all aspects and stimulates the generation of radical innovation behavior of employees. A survey of 105 Singapore companies by Barnard et al. showed that employee development (including developing performance evaluations, training inputs, and organizational culture) was significantly associated with high performance work systems. Guthrie's sample survey of 164 New Zealand businesses across a range of industries found some relationship between human resource management practices and workforce stability and productivity. In a system with high work participation, employee stability is positively correlated with productivity. For enterprises with low employee participation, employee stability is negatively correlated with production efficiency.

Therefore, based on the above analysis, this paper proposes the following hypothesis:

H1: High performance work system has a significant positive impact on employees' breakthrough innovation behavior.

The Relationship Between High Performance Work System and Knowledge Absorption

High performance work system can effectively integrate internal and external resources and promote knowledge flow. Shi Liping et al. found that high performance work system can promote knowledge innovation mainly by influencing knowledge search depth, knowledge search breadth and knowledge activity. High performance work practice system significantly stimulates knowledge activity, and significantly improves the depth and breadth of knowledge search. Wang Caohong studied the high performance work system in knowledge-based enterprises and found that the high performance work system has a significant effect on knowledge acquisition. Therefore, the following assumptions are made in this study:

H2: High performance work system has significant positive influence on knowledge absorption.

The Relationship Between High Performance Work System and Knowledge Distribution

Qin Jian's research shows that high performance work system promotes knowledge diffusion and achieves breakthrough innovation. Zhang Caihong et al. studied the high performance behavior of knowledge workers in Chinese enterprises, and the results showed that HRM with high performance behavior can enhance employees' willingness to flow knowledge. Therefore, high performance work system can promote knowledge flow, and this study makes the following hypothesis:

H3: High performance work system has significant positive influence on knowledge diffusion.

The Relationship Between Knowledge Absorption and Employees' Breakthrough Innovation Behavior

Knowledge flow and knowledge innovation can improve technological innovation performance of enterprises. Ni Ziyin et al. studied the influence of absorptive capacity and network capacity on technological innovation performance of enterprises, and the research results show that absorptive capacity and network capacity are the key capability elements of technological innovation capability of enterprises. Wang Haijun et al. conducted a case study on the open innovation of Haier Group in China, and the results show that the business model of open innovation can effectively integrate partners to participate in innovation. Chen Jin et al. believe that under the open innovation paradigm, the innovative ideas inside the enterprise may spread to the outside of the enterprise through the flow of knowledge and personnel at any stage of research or development, which can promote the scientific and technological personnel to produce many breakthrough ideas and research results and commercialize them, so as to obtain huge profits.

H4: Knowledge absorption has a significant positive effect on employees' radical innovation behavior.

The Relationship Between Knowledge Distribution and Employees' Breakthrough Innovation Behavior Xu Heping et al. adopted the knowledge chain method to explore the ways and approaches of technology and knowledge diffusion and innovation in virtual enterprises, and the research results show that knowledge diffusion has a significant positive impact on technological breakthrough and innovation. Qin Jian's research shows that knowledge diffusion has a significant impact on radical innovation. Yang Juping et al. believe that the innovation-driven role of knowledge diffusion in leading enterprises can influence enterprises to achieve technological breakthrough and innovation. Therefore, the following assumptions are made in this study:

H5: Knowledge diffusion has a significant positive effect on employees' breakthrough innovation behavior.

Knowledge Absorption and Knowledge Diffusion Play a Mediating Role in the Relationship Between High Performance Work System and Employees' Breakthrough Innovation Behavior Xie Xuemei et al. took 379 electronic information enterprises in the Yangtze River Delta as the research object and used multiple regression method to explore the mediating effect of knowledge absorption capacity on collaborative innovation network and innovation performance of enterprises. The results show that there is a positive correlation between knowledge absorption capacity and innovation performance. According to the above hypothesis, high performance work system is related to knowledge flow, and knowledge flow is related to employees' radical innovation behavior. Therefore, the following assumptions are made in this study:

H6: Knowledge absorption plays a mediating role in the relationship between high performance work system and

employees' radical innovation behavior.

H7: Knowledge diffusion plays an intermediary role in the relationship between high performance work system and employees' radical innovation behavior.

Framework of Research Concept

Through the description of the above assumptions, the conceptual framework of this research is shown in Figure 1. The high performance work system is divided into three dimensions: skill improvement practice system, motivation improvement practice system, opportunity improvement practice system, and communication improvement practice system. Knowledge flow is divided into two dimensions: knowledge absorption and knowledge diffusion.

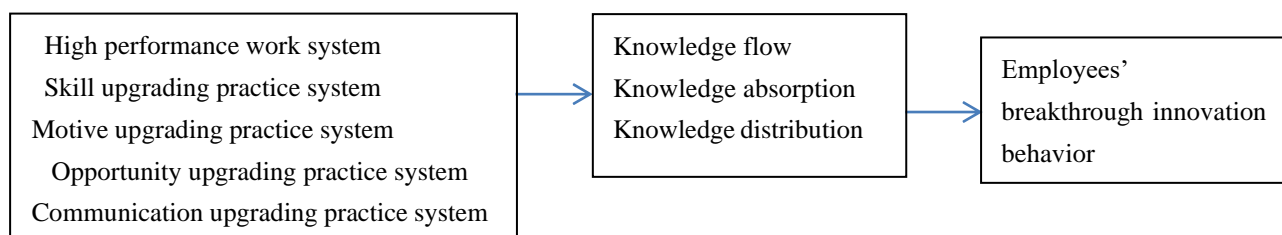


Figure 1. Framework of Research Concept

3. Research Design

Selection of Samples and Collection of Sample Data

In this study, 53 high-tech enterprises were selected, 331 technical personnel were selected as research objects, and the samples were mainly distributed in 10 cities, including Guangzhou, Nanning, Dongguan, Foshan, Chengdu, Chongqing, Wuhan, Shenzhen, Qingdao, Jinan, etc. In this study, convenience sampling method in non-probability sampling was adopted for sampling. There were three main ways to distribute questionnaires: (1) Questionnaires were distributed on the site of the enterprise training meeting, (2) questionnaires were distributed through the enterprises of relatives and friends, and (3) questionnaires were distributed through online means such as questionnaire star and Internet link. After the questionnaires were collected, invalid questionnaires (incomplete questionnaires and all questionnaires with the same answers) were eliminated to ensure the authenticity and validity of the questionnaire data.

According to the principle of 10:1 determined by Wu Minglong, the sample size should be more than 10 times of the total questions in the questionnaire. There are 24 questions in this questionnaire, so the sample size should be no less than 240. A total of 500 questionnaires were sent out in this study, and 331 valid questionnaires were collected, with an effective recovery rate of 66.2%, which met the requirement of sample size.

4. Conclusions

By constructing the structural equation model of high performance work system, this paper analyzes the influence path of high performance work system on the promotion of employees' radical innovation behavior. Through the empirical study, it is found that under the mediating effect of knowledge absorption and knowledge diffusion, high performance work system can effectively promote employees' radical innovation behavior. The research results prove that the high performance work system includes all-round skills enhancement practice, motivation enhancement practice, opportunity enhancement practice and communication enhancement practice, and the system can comprehensively train and improve employees' various abilities. Through the specific practice of employee skills, innovation motivation, participation in management, performance evaluation and other practices, employees can acquire professional knowledge and skills, cultivate their innovative thinking and motivation, and promote their breakthrough creative behavior. At the same time, the high performance work system can penetrate the frontier knowledge out of the enterprise boundary, establish the enterprise knowledge network, let the enterprise frontier technology spread to the outside of the enterprise, and create more business value for the enterprise. Employees can also enhance their commitment and identity to the organization through the high performance work system, and promote innovative thinking, innovative motivation and innovative practice.

The contribution of this paper is to study the impact of high performance work system on employees' radical innovation behavior from the perspective of open innovation, which enriches the research theory of the relationship between high performance work system and employees' radical innovation behavior. At the same time, knowledge absorption and knowledge diffusion are introduced as mediating variables to test the hypothesis through exploratory analysis and confirmatory analysis. Based on the existing theory, it is an important supplement to the research on the relationship between high performance work system and employees' radical innovation behavior. In addition, through quantitative

analysis, questionnaire survey and structural equation model construction, this paper explores the role of high performance work practice system on employees' radical innovation behavior, which has practical value for Chinese enterprise management in the context of China.

Therefore, this study puts forward three suggestions: (1) To build a high performance work practice system and guide employees to innovate. Enterprises can ensure the communication of organizational innovation strategy by building a high performance work practice system, and equip employees with the foundation and ability of innovation and cultivate their innovative thinking and ability by coordinating and cooperating with multiple practice combinations. At the same time, the high performance work practice system can effectively evaluate employees' innovation performance, customize training programs and career planning for employees, and guide employees' creativity. (2) Develop open innovation mode to achieve technological breakthrough and innovation of enterprises. Enterprises should change the mode of innovation, break through the traditional closed mode of innovation, break the boundary of knowledge transmission, establish an open mode of innovation, build the enterprise knowledge network, achieve technological breakthrough and innovation, create business value for enterprises, and realize the sustainable development of enterprises. (3) Strengthen the cultivation of innovative talents and enhance the core competitiveness of enterprises. Enterprises should strengthen the cultivation of innovative talents, through high performance work system, strengthen the implementation of talent strategy, provide employees with innovative atmosphere and conditions, stimulate the flow of active knowledge, and enhance the core competitiveness of enterprises.

Due to the constraints of some factors, this study also has some shortcomings, such as insufficient sample size and insufficient diversity of research methods. In the future, this study will further study the impact of high performance work system on enterprise management from different perspectives, analyze the effects and differences of high performance work system in different groups, and expand the depth and breadth of the research.

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