THE IMPACT OF LEARNING FROM INNOVATION FAILURE ON THE FIRM'S INNOVATION PERFORMANCE, THE MEDIATING ROLE OF KNOWLEDGE MANAGEMENT

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Abstract: In this study, the core conceptual framework was constructed by introducing the following demographic variables such as gender and age, using innovation failure learning, firm innovation performance and knowledge management as variables. Attempting to analyze the differences in the perceived means of the respondents' demographic variable groupings in each variable of innovation failure learning, corporate innovation performance and knowledge management and the influence of the independent variables on the dependent variables, this study formulated the research hypothesis and used Company A as a case study, in the study population, the sample size was calculated as 21470 using simple random sampling method, 430 questionnaires were distributed in this study, using simple random sampling method to distribute the questionnaires and 415 questionnaires were returned with a recovery rate of 96.5%.

This study finds the specific manifestation of innovation failure learning, corporate innovation performance and knowledge management in the subsequent changes in the actual work. This study provides a reference basis for subsequent scholars' research, discusses ways to improve and enhance enterprise performance in the future, as well as outlooks and suggestions for future related research.

Keywords: Innovation Failure Learning, Corporate Innovation Performance, Knowledge Management

Introduction

The idea that innovation is a key driver of business development has been widely recognized in both academia and business practice. Scholars such as Brown and Anthony (2011), and Tidd and Bessant (2014) have emphasized in their studies the importance of innovation in improving firm competitiveness and achieving sustainable development. However, despite the great potential of innovation, it is inevitable to experience the phenomenon of failure in the process of innovation. Scholars such as Dahlin, Weingart and Hinds (2005) point out that firms may face the risk and challenge of failure when pursuing innovation.

Conventional wisdom suggests that innovation failure is usually viewed as a negative outcome

that may result in losses and risks to the firm. Researchers such as Kessler and Chakrabarti (1996) have emphasized the adverse effects of innovation failure in their studies, including financial losses, reputational damage, and loss of market share. Such perceptions have led to fear and avoidance of innovation, prompting some firms to choose conservative and traditional practices to avoid risks when faced with innovation. However, with deeper research and renewed ideas, some scholars have begun to revisit innovation failure and view it as a useful learning opportunity.

Scholars such as Govindarajan & Trimble (2005), and Tushman & Romanelli (1985) emphasize the learning value embedded in innovation failure. They argue that learning from failures is one of the most important ways for firms to acquire knowledge and improve their competitiveness. Effective learning from innovation failures can help firms better understand issues such as market demand, product design, and organizational management. In addition, by analyzing failures, firms can identify the root causes of failures so that they can adjust their strategies and actions to improve the success rate of future innovation activities.

Scholars such as Hansen and Birkinshaw (2007) believe that learning from innovation failures can not only help firms improve their existing products and services, but also promote organizational culture change and the development of innovation awareness. They point out that enterprises should encourage their employees to try new ideas and methods in innovation practice, and when failure occurs, they should encourage their employees to dare to face the failure and summarize the lessons in time in order to continuously improve their innovation ability and competitiveness.

In this context, innovation failure learning has gradually become an important topic in enterprise management and organizational development. Enterprises increasingly realize that innovation failure is not only a risk and a challenge, but also a valuable learning opportunity. Therefore, more and more enterprises are trying to establish an innovation failure learning mechanism in order to learn from failures, optimize their innovation practices, and enhance their competitiveness and sustainable development.

Despite the importance of innovation failure learning, it is not easy to realize effective learning. First of all, enterprises need to establish a positive organizational culture to encourage employees to dare to try and innovate, and not to be discouraged when failure occurs, but to face it and summarize the lessons learned in a timely manner. Second, enterprises need to establish a sound knowledge management system to effectively collect, organize and share lessons learned from innovation failures. By recording and analyzing failure cases in a systematic way, firms can better understand the causes and mechanisms of failures and provide strong references and guidance for future innovation activities.

It is also important to note that learning from innovation failures is not a simple process, but a continuous learning and improvement process. Enterprises need to continuously adjust and optimize their learning mechanisms to adapt to the changing market environment and competitive landscape. At

the same time, enterprises also need to keep an open mind, actively learn from others' experiences and lessons, and continuously improve their own innovation practices in order to stand out in the fierce market competition.

To summarize, innovation failure learning has an important impact on the innovation ability and competitiveness of enterprises. Although innovation failure may bring certain risks and challenges, by effectively learning and summarizing the lessons of failure, enterprises can continuously improve their innovation capability and competitiveness and achieve sustainable development. Therefore, enterprises should actively advocate learning from innovation failures and establish good learning mechanisms and knowledge management systems in order to better cope with increasingly fierce market competition and achieve long-term success and sustainable development.

Research Objective (s)

Objective 1: To explore the direct impact of innovation failure learning on firms' innovation performance.

Objective 2: To investigate the relationship between innovation failure learning and knowledge management.

Objective 3: To study the relationship between corporate innovation performance and knowledge management.

Literature Review

The main contributions of this study are at both theoretical and practical levels:

Theoretical Contribution:

An in-depth study of the mechanisms influencing learning from innovation failure is an important contribution to the field of organizational science and innovation management. While the conventional wisdom is that innovation failure is a negative event in the process of business development, a growing body of research suggests that innovation failure may also be a valuable learning opportunity. This study provides rich content and new perspectives for theoretical frameworks in related fields by providing in-depth analysis of the process, mechanism, and impact of innovation failure learning on firms' innovation performance.

First, to understand the mechanism of the impact of innovation failure learning, the nature of innovation failure and its significance in organizational science need to be explored. Innovation failure refers to the unsuccessful outcome encountered when trying to implement a new idea, method, or product. While traditional views view innovation failure as the shame of the loser, scholars are beginning to recognize that innovation failure is actually a valuable learning opportunity. in their 1996 study, Argyris and Schön pointed out that innovation failure can prompt organizational members to

reflect, learn, and ultimately improve and optimize the innovation process. Therefore, innovation failure learning is seen as a learning process that has positive implications for both individuals and organizations.

Second, understanding the impact mechanism of innovation failure learning requires digging deeper into the process of innovation failure learning. The process of learning from innovation failure is not simply learning from failure, but a complex cognitive and behavioral process. In the face of innovation failure, individuals and organizations need to engage in cognitive restructuring, reassess existing cognitive models and assumptions, and learn from them. This learning process may involve emotional experiences, cognitive restructuring, and behavioral changes for individuals, and is a gradual and dynamic process.

Further, understanding the mechanisms that influence innovation failure learning requires exploring its impact on firms' innovation performance. Innovation failure learning is not just about coping with current failures, but more importantly about improving future innovation capabilities and performance. By learning from failures and applying them, firms can continuously improve their innovation strategies and methods, increase the probability and effectiveness of innovation success, and thus promote firms' innovation performance.

Based on the above analysis, this study provides an in-depth analysis of the influence mechanism of learning from innovation failure, which provides a rich theoretical framework for the field of organizational science and innovation management. While the conventional wisdom is that innovation failure is an unfavorable outcome, a growing body of research suggests that innovation failure can also be viewed as a beneficial learning opportunity. By analyzing the process, mechanism, and impact of innovation failure learning on firms' innovation performance, this study provides a new perspective and theoretical basis for related theories. This research not only expands the academic understanding of innovation failure learning, but also provides valuable insights for the practice community, which can help organizations better cope with innovation challenges and improve innovation performance levels.

Second, this study systematically analyzes the mediating role of KM between innovation failure learning and innovation performance, and reveals in depth the criticality of KM in promoting innovation. In today's competitive business environment, KM is seen as an important tool to help firms effectively manage and fully utilize their knowledge resources (Nonaka & Takeuchi, 1995). By exploring the mechanism of KM's role between innovation failure learning and innovation performance, this study further expands the scope of research in the field of KM, and provides firms with suggestions for more effective innovation management strategies and practices.

In the traditional conception, innovation failure is often regarded as a negative outcome, but recent studies have gradually revealed its potential positive effects. Innovation failure can not only

provide valuable lessons, but also stimulate deeper learning and thinking. In their work, Argyris and Schön (1996) emphasized the importance of innovation failure as a learning opportunity, a view that motivated this study. By providing insights into the mechanisms that influence learning from innovation failure, this study provides new perspectives for re-examining the role, value and management of innovation failure.

On this basis, this study further focuses on the mediating role of knowledge management between innovation failure learning and innovation performance. Knowledge management, as a management approach and concept, aims to promote the creation, sharing and application of knowledge, thereby improving the innovation capability and competitiveness of organizations. The knowledge management theory proposed by Nonaka and Takeuchi (1995), which emphasizes the importance of knowledge in organizations and proposes a theoretical framework for knowledge transformation, is of great importance in understanding the mechanism of the role of knowledge management in the innovation process guiding significance. By systematically analyzing the mediating role of KM between innovation failure learning and innovation performance, this study finds that KM plays an important bridging role in the innovation failure learning process. First, KM can help organizations better identify, summarize, and share lessons learned from innovation failures, thereby facilitating employee learning and growth. Second, KM can build and maintain an organizational environment that is conducive to knowledge flow and exchange, so that innovation failure learning can be carried out smoothly. Third, KM can facilitate the transformation of the results of innovation failure learning into actual innovation actions, thus laying the foundation for the improvement of corporate innovation performance. In addition, this study also found that the impact of knowledge management on innovation performance is not only reflected in the mediating role, but also directly affects the level of innovation performance of enterprises. Through effective management and utilization of knowledge resources, enterprises can improve the efficiency and effectiveness of innovation activities, thus accelerating the introduction of new products and services and enhancing market competitiveness.

In summary, by systematically analyzing the role mechanism of knowledge management between innovation failure learning and innovation performance, this study not only expands the scope of research in the field of knowledge management, but also provides more effective innovation management strategies and practical suggestions for enterprises. In the current era of knowledge economy, effective management and utilization of knowledge resources are crucial to the sustainable innovation and development of enterprises. Therefore, the findings of this study are of great theoretical and practical significance for enhancing the innovation capability and performance level of enterprises.

Practical Contribution:

This study provides effective management strategies and practical suggestions for firms to promote innovation performance and competitive advantage. In today's rapidly changing and uncertain

market environment, firms face increasing challenges and risks (Eisenhardt & Martin, 2000). How to flexibly cope with failures in the innovation process and learn to learn from failures are crucial to the long-term development of firms (Simonin, 1999).

First, this study provides insights into the mechanisms influencing learning from innovation failure, providing a rich theoretical framework for the field of organizational science and innovation management. Conventional wisdom views innovation failure as an unfavorable outcome, yet a growing body of research suggests that innovation failure can also be viewed as a beneficial learning opportunity (Argyris & Schön, 1996). By analyzing the process, mechanism, and impact of learning from innovation failure on firms' innovation performance, this study provides an in-depth analysis of this issue and offers a new perspective and theoretical basis for related theories.

Second, this study systematically analyzes the mediating role of KM between innovation failure learning and innovation performance, revealing the importance of KM in promoting the innovation process. Knowledge management is considered an important tool to help firms manage and utilize knowledge resources effectively (Nonaka & Takeuchi, 1995). By exploring the mechanism of KM's role between innovation failure learning and innovation performance, this study further expands the scope of research in the field of KM and provides firms with suggestions for more effective innovation management strategies and practices.

By combining innovation failure learning and knowledge management, this study proposes a series of management strategies and practical suggestions that aim to help companies achieve better innovation performance and sustained competitive advantage in a competitive market. First, companies can establish a culture of innovation failure learning to encourage their employees to dare to try and accept failure, and to learn valuable lessons from it. Second, enterprises should focus on knowledge management and establish a sound knowledge base and sharing platform to facilitate the sharing and dissemination of innovation knowledge and improve the efficiency and effectiveness of innovation activities. In addition, enterprises can take a series of measures to strengthen the construction and management of innovation teams, including formulating clear innovation goals and plans, strengthening communication and collaboration among teams, and providing necessary resource support. In addition, enterprises should establish an effective innovation performance evaluation system to identify and reward innovation achievements in a timely manner, and to motivate the innovation vitality and enthusiasm of employees.

In summary, the management strategies and practical suggestions proposed in this study can help enterprises improve their innovation capability and competitiveness and realize sustainable development. By incorporating innovation failure learning and knowledge management into management practices, enterprises can better cope with market changes and competitive challenges and lay a solid foundation for future development.

Methodology

When conducting sample sampling, we can categorize two types of sampling: non-probability sampling and probability sampling. The most important feature of non-probability sampling is that it lacks a strict random principle and sample selection is not based on randomness. The advantages of non-probability sampling are its simplicity, the absence of a sampling frame, its cost-effectiveness, and its ability to process survey data quickly. However, the limitations of non-probability sampling are the inability to calculate sampling error, the inability to control error in a probabilistic manner, and the inability to generalize sample data to the overall situation. In addition, due to greater randomness in the sampling process, investigators usually select units that are easily accessible and friendly to the survey, which leads to systematic differences between survey units.

Probability sampling, also known as random sampling, is a sampling method based on the principle of randomness in which a number of units are selected from the overall population according to a pre-designed procedure. Probability sampling has the following characteristics: 1) the sample is drawn with a certain probability according to the principle of strict randomness; 2) the probability that each unit will be selected is known or can be calculated; and 3) the probability of sample selection is not taken into account when the sample is used to estimate the overall target quantity. In other words, the estimate is related not only to the observed values of the sample units, but also to their "probability of being sampled". The main advantage of probability sampling is that, since each sample unit is randomly selected and the "sampling probability" of each unit can be calculated, it is possible to obtain an estimate of the overall target variable and to calculate the sampling error of each estimate, thus obtaining a reliable level of inference.

Probability sampling consists of several basic sampling methods: 1) simple random sampling, 2) stratified sampling, 3) whole group sampling, 4) multi-stage sampling, and 5) systematic sampling. In this paper, we mainly use the whole group sampling method in probability sampling. Whole group sampling is to combine some basic units of the overall population into groups to form clusters. In the sampling process, we directly select these clusters and investigate all the basic units in the selected clusters. By using this sampling method, we are able to cover the overall population more comprehensively and obtain a reliable estimate of the overall target volume.

Results

This study aims to analyze the interrelationships among personal traits, innovation failure learning, firm innovation performance, and knowledge management, and draws the following conclusions:

1. Personal traits have a significant effect on innovation failure learning and corporate innovation performance. The results of the study validate hypotheses H1 and H2 that different personal

traits significantly affect innovation failure learning and corporate innovation performance. Differences in personal traits affect the acceptance of innovation failure and the learning effect of individuals, which in turn have an impact on the innovation performance of enterprises. Therefore, we should pay attention to the diversity of personal traits in organizational management, and develop corresponding innovation training and incentive mechanisms according to the traits of different individuals, in order to promote innovation failure learning and improve enterprise innovation performance.

2. There is a correlation between innovation failure learning and knowledge management. The results of the study support hypothesis H3, that is, learning from innovation failure is an important process of knowledge acquisition and transformation, which helps organizations accumulate valuable experience and lessons, and then promotes the sharing, dissemination and application of knowledge. Therefore, organizations should pay attention to innovation failure learning and strengthen the construction of knowledge management system to provide effective support and guarantee for innovation activities.

3. There is a significant positive relationship between corporate innovation performance and knowledge management. The results of the study support hypothesis H4, that is, good knowledge management can promote the innovation ability and performance level of the enterprise, and help to improve the position and competitive advantage of the enterprise in the market competition. Therefore, organizations should strengthen their attention and investment in knowledge management and establish an effective knowledge management system to enhance the innovation performance of enterprises.

4. There is a significant positive relationship between innovation failure learning and corporate innovation performance. The results of the study support hypothesis H5, that is, innovation failure learning helps organizations to learn lessons, improve innovation strategies and methods, and increase the probability and effect of innovation success, thus promoting the innovation performance of enterprises. Therefore, organizations should encourage employees to try and accept failure, and create a good learning atmosphere to promote the occurrence and continuation of innovation failure learning.

In summary, there is a close relationship between personal traits, innovation failure learning, enterprise innovation performance and knowledge management. In organizational management, attention should be paid to the diversity of personal traits and the construction of innovation failure learning and knowledge management should be strengthened in order to improve the innovation ability and performance level of enterprises.

Discussion

The aim of this study was to explore the relationship between personal traits, learning from innovation failure, firm innovation performance and knowledge management, revealing the complex links between them. The following discussion section provides further analysis and interpretation of the

findings, as well as implications for theory and practice:

1. The relationship between personal traits and innovation failure learning: personal traits have a significant impact on innovation failure learning. Research has shown that individuals with traits such as openness, self-confidence and adaptability are more willing to learn from innovation failure, whereas more conservative and cautious individuals may have difficulty accepting failure and learn less effectively. This suggests that the differences in individual traits should be emphasized in organizational management, and that training and incentives should be used to promote employees' knowledge and learning from innovation failure, so as to enhance the organization's innovation capability.

2. The relationship between learning from innovation failure and enterprise innovation performance: learning from innovation failure has a significant positive effect on enterprise innovation performance. Research results show that enterprises with good innovation failure learning ability are more capable of adjusting their innovation strategies and methods, improving the probability and effect of innovation success, and thus realizing sustained innovation and competitive advantage. Therefore, organizations should encourage employees to try and accept failure, and create a good learning atmosphere to promote the occurrence and continuation of innovation failure learning, so as to promote the innovation performance of enterprises.

3. Relationship between learning from innovation failure and knowledge management: Learning from innovation failure and knowledge management are closely related, and they complement each other to promote the organization's learning and innovation ability. Learning from innovation failure is an important knowledge acquisition and transformation process, which can accumulate valuable experience and lessons for the organization, and then promote the sharing, dissemination and application of knowledge. Therefore, organizations should strengthen the importance and support for innovation failure learning and establish an effective knowledge management system to promote organizational learning and innovation.

4. The relationship between enterprise innovation performance and knowledge management: good knowledge management can promote enterprise innovation performance. It is found that the establishment of an effective knowledge management system is conducive to the organization's better use of internal and external knowledge resources, improve the efficiency and effectiveness of innovation activities, and then achieve the improvement of enterprise innovation performance. Therefore, organizations should strengthen the investment and construction of knowledge management and establish a perfect knowledge management mechanism in order to improve the innovation ability and performance level of enterprises.

In summary, there is a complex relationship between personal traits, innovation failure learning, enterprise innovation performance and knowledge management, which needs to be paid attention to and dealt with in organizational management and practice. Future research can further explore in-depth their

intrinsic mechanisms and influencing factors to provide more effective theoretical support and management guidance for organizational innovation and development.

Conclusions

This study explores and analyzes the relationship between personal traits, innovation failure learning, corporate innovation performance and knowledge management, and makes the following recommendations to guide practice and management:

1. Strengthen personal trait training and incentive mechanisms: In response to the diversity of personal traits, organizations should strengthen the construction of training and incentive mechanisms to promote employees' knowledge and learning from innovation failure. This includes training and incentives to help employees develop positive innovation attitudes and mindsets, and to enhance their ability to innovate and cope with innovation failure.

2. Establish a learning mechanism for innovation failure: Organizations should establish a learning mechanism for innovation failure to encourage employees to actively try and accept failure and create a good learning atmosphere. Through the formulation of clear policies and processes, help employees summarize and share the lessons learned from innovation failures, and promote organizational learning and progress.

3. Constructing a knowledge management system: Strengthen the construction of a knowledge management system and establish a sound mechanism and platform to facilitate the sharing, dissemination and application of knowledge. This includes the establishment of a knowledge base, an expert sharing platform, etc., to help the organization make better use of internal and external knowledge resources and improve the efficiency and effectiveness of innovation activities.

4. Setting up an innovation performance evaluation and incentive mechanism: Establish an effective evaluation and incentive mechanism to recognize and reward innovation achievements in a timely manner, and stimulate the innovation vitality and motivation of employees. Through the innovation reward system, project evaluation and other measures, employees are incentivized to actively participate in innovation activities and promote the improvement of corporate innovation performance.

5. Strengthen organizational learning and cultural construction: Strengthen organizational learning and cultural construction to create a positive learning atmosphere and innovation culture. This includes focusing on the accumulation and transmission of knowledge, advocating the concept of a learning organization, encouraging employees to learn and progress continuously, and improving the organization's innovation ability and competitiveness.

In summary, in order to improve the innovation ability and performance level of the organization, it is necessary to strengthen the training and incentive mechanism of personal traits,

establish a learning mechanism for innovation failure, build a knowledge management system, set up an effective innovation performance evaluation and incentive mechanism, as well as strengthen the organizational learning and culture construction. These recommendations will provide effective theoretical guidance and practical support for organizational innovation and development.

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