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The Internal Influencing Factors on Management Innovation of SMEs in Fujian Province, China: A Conceptual Study

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Abstract

Small and medium-sized enterprises (SMEs) play a significant role in the economy of China. In the rapidly developing digital economy, opportunities and challenges coexist. SMEs should invest in appropriate resources to enhance their management innovation capabilities in the digital transformation process, and to improve market competitiveness in this globalized arena of today. There are many factors that influence management innovation. Based on the innovation diffusion theory, this study observed the process model of management innovation

to build a conceptual framework for the internal influencing factors of management innovation. It should be emphasized that this study currently lacks empirical verification, more research is necessary to test the effect of internal factors on management innovation. This study establishes a conceptual framework that includes senior management support, employee training and successful adoption of technologies as internal influencing factors for management innovation in SMEs, while also focusing on the mediating role of knowledge sharing. This provides a foundation for subsequent empirical research.

Keywords: management innovation, small and medium-sized enterprises, digital transformation, knowledge sharing

1. Introduction

1.1 Background

In China, Small and medium-sized enterprises (SMEs) are the main force of contemporary economy and the mainstream form of industrial organization representing the direction of social and economic development (Li, 2024; Gu, 2024)). They play an irreplaceable role in increasing employment, enhancing competition intensity, strengthening overall economic vitality, and establishing a more efficient production system through complementarity with large enterprises (Kamytbekuly & Maulenbayevna, 2024). As the largest and most dynamic enterprise group, it naturally becomes the main force of transformation, and the role of SMEs in the industrial structure is constantly highlighted, and their competitive position in the industrial chain is also adjusted accordingly (Gu, 2024). In the rapidly changing global economic environment, SMEs are facing increasingly fierce competition and customer loss. seeking a paradigm or guidance, especially in the process of transformation, seeking guidance from government authorities on methods or solutions (Zhang, 2024; Yang, 2023).

Digital transformation of enterprise refers to the process of utilizing the combination of digital technology to trigger significant changes in entity attributes, thereby improving the process of entities (Li et al., 2022). Digital transformation transforms and upgrades a single, rigid business model to a composite, flexible digital operation (Li et al., 2022). This has led to a shift in business models that can improve organizational processes, enhance customer value proposition, reduce product and service costs, achieve breakthrough innovation and competitive advantage, which have a significant impact, also brought many benefits to the organization (Bouwman et al., 2019).

Management innovation, as one of the topics of concern for managers in China, has begun to show theoretical research and practical exploration results in the digital transformation of enterprises (Chen, 2024; Birkinshaw et al, 2008; Hamel, 2006). In the past few decades, many well-known firms have been at the forefront of management innovation, constantly developing and implementing new management practices to cope with rapidly changing market environments and increasingly fierce competition (Yusupova et al., 2024; Hamel, 2006). These enterprises realized that relying solely on traditional management methods is

difficult to meet modern business needs, and actively explored more efficient, flexible, and innovative management models (Chen, 2024; A et al., 2022; Alcamí et al., 2011). For example, they introduced new concepts such as lean management, agile development, and flat organizational structure to improve internal operational efficiency and the ability to adapt to external changes (Onesi-Ozigagun et al., 2024; Frynas et al., 2018; Hamel, 2006). At the same time, these management practices not only help enterprises improve performance, but also lead industry standards in certain industries, becoming a model for other companies to learn from and draw inspiration from (Delhi, 2024). The continuous innovation is driven by the pursuit of long-term competitiveness by enterprises and a keen insight into constantly changing customer needs (Delhi, 2024; A et al., 2022; Hamel, 2006).

1.2 Problem Statement

Although the importance of management innovation has been widely recognized, enterprises still need to strive to accurately grasp its core-essence to effectively implement innovation strategies (Dubey & Yadav, 2021; Birkinshaw et al., 2008). According to Anyigba and Addo (2023) and Reeves and Whitaker (2022), there is a significant gap between theory and practice about management innovation, the challenges faced by enterprises in practice are particularly prominent. The management innovation implementation process involves diverse activities and participants at different stages (Birkinshaw et al., 2005), and the obstacles encountered in specific stages also vary (Dubey & Yadav, 2021; Hamel, 2006). Previous studies have shown that many enterprises have insufficient understanding of management innovation and lack relevant management capabilities, resulting in low efficiency and even missing opportunities in promote management innovation (Anyigba & Addo, 2023; Yang, 2023). This gap reflects that enterprises still need further integration and improvement in theoretical guidance and practical application.

It should be noted that there are various factors that influence management innovation, and their complexity and interweaving increase the difficulty for enterprises to find key points when implementing management innovation (Zhang, 2022). Most studies tend to focus more on large enterprises, however, there are significant differences between SMEs and large enterprises in terms of business model, operation management, human resources etc. (Banerjee, 2023; Diener & Špaček, 2021; Gamage et al., 2020). SMEs face various limitations in resources, capabilities, and external environment, resulting in a lack of successful cases of management innovation in the scale category of their industry, and often have more difficulties and risks in implementing management innovation (Chen, 2024; Jia, 2023).

Firstly, the lack of funds and human resources makes it difficult for SMEs to invest sufficient resources in exploring and implementing management innovation (Jia, 2023). Compared to large enterprises, SMEs often lack specialized management teams and systematic innovation mechanisms, which makes innovation activities easy to surface or difficult to sustain (Chen, 2024; Edeh et al., 2024). Secondly, the ability of SMEs to obtain information and

cutting-edge knowledge is relatively weak, which makes it difficult for them to timely grasp industry trends or draw on successful practical experience in the innovation process (Andrade-Rojas et al., 2024). This information asymmetry further exacerbates the uncertainty of innovation (Yıldırım et al., 2023). In addition, management innovation is complex, involving deep changes in corporate culture, organizational structure, and management processes, and SMEs often lack sufficient experience and maturity in these areas (Ivanović et al., 2022). Finally, the risks brought by management innovation have significantly increased the concerns of SMEs (Guo, 2023; Zhang, 2022). On the one hand, failed innovation attempts may cause significant depletion of already limited resources (Ivanović et al., 2022), the implementation of innovation may lead to employee resistance or confusion in business processes, thereby affecting the normal operation of the enterprise (Malik, 2023). These situations make SMEs more cautious in management innovation, but often miss opportunities to enhance competitiveness through innovation as a result (Malik, 2023).

To solve these gaps, this study focuses on SMEs in Fujian Province, China, aiming to examine the internal factors that influencing management innovation in these enterprises. As this study cannot comprehensively cover all variables related to management innovation, the focus will be on studying the main influencing factors related to key points in management innovation practice, providing practical and feasible reference suggestions for SMEs with relatively limited resources and capabilities.

2. Literature Review

2.1 Theory

Rogers (1983) proposed innovation diffusion theory, which aiming to analyze how innovation spreads through media and is accepted by individuals or organizations (Srivastava & Moreland, 2012). Its framework delves into the essence, influencing factors, dissemination process, and impact on organizations of innovation, making it particularly suitable for studying the implementation and diffusion of management innovation (Maienhofer & Finholt, 2002). This theory emphasizes the key links in innovation communication, including how individuals and organizations understand, adopt, and transmit new ideas or practices (Kautz & Larsen, 2000).

In the field of management innovation, innovation diffusion theory provides guidance through five phases as understanding, interest, evaluation, experimentation, and adoption (Kiwanuka, 2015). For example, management innovation involves a complex process from initial conception to practical application, and its success depends on factors, such as leadership style, employee acceptance and organizational culture, which is highly consistent with the analysis of social system characteristics in innovation diffusion theory (Zekić et al., 2018). Birkinshaw et al. (2008) further proposed a four-stage model for management innovation, includes motivation, invention, implementation, and theorization. The dissemination of management innovation may either remain at a shallow level of change

based on existing processes or deeply challenge existing belief systems, prompting organizations to redefine core concepts (Birkinshaw et al., 2008). This hierarchical division corresponds to the concepts of innovation depth and dissemination scope in innovation diffusion theory.

Through the framework of innovation diffusion theory, managers can identify key factors in innovation communication, such as the influence of early adopters, optimization of communication channels, and adaptability to internal and external organizational environments, to more effectively promote the implementation of management innovation. This theory not only helps companies understand the logic of innovation communication, but also provides practical guidance for continuous improvement in management innovation (Vernanda et al., 2023).

2.2 Management Innovation

Management innovation, as a research field, originated from Schumpeter (1912). Over time, innovation research has been divided into two main branches: technological innovation and management innovation. Among them, management innovation focuses on optimizing enterprise management practices and corporate governance, which is the key to enhancing enterprise competitiveness and sustainability. Since the 1980s, management innovation has gradually received widespread attention and become an important topic of theoretical and empirical research.

2.2.1 The Concept and Model of Management Innovation

Management innovation has been defined as introducing new management methods, tools, or organizational structures into an enterprise to improve resource integration efficiency and organizational performance (Dubey & Yadav, 2021). It also be defined as the process of adopting new management practices or technologies (Birkinshaw et al., 2008). While Zhang (2022) described it as the entire process of optimizing the combination of enterprise resources to achieve goals. Further research has refined the concept of management innovation into three categories: foundational innovation, methodological innovation, and task innovation (Lin et al., 2023). In addition, some scholars have proposed different management innovation models. For example, Onesi-Ozigagun et al. (2024) and Hamel (2006) incorporated lean management into the scope of management innovation, emphasizing that its driving factors involve multiple levels such as organization, individuals, and environment. Overall, management innovation is an important strategy for enterprises to respond to market changes and improve operational efficiency through innovative concepts, processes and tools.

Management innovation has five key dimensions: strategy, structure, staff motivation and development, partnerships of inter organizational, and information and communication technology (ICT) (Zhang, 2022; Kraśnicka et al., 2016). The strategy dimension refers to the adjustment of new business models, technological innovations and operational methods (Li et al., 2024). The structure dimension focuses on organizational flexibility, such as creating new

departments or optimizing communication processes (Yusupova et al., 2024; Vaccaro et al., 2010). The staff motivation and development dimension emphasizes the practice of enhancing employee skills and innovation abilities (Henao-García & Montoya, 2023). The partnerships dimension focuses on cooperation with external partners and building an open innovation model (Lin et al., 2023). The ICT dimension involves the innovation of information acquisition, processing, and transmission tools (Kraśnicka et al., 2016).

2.2.2 Driving Factors of Management Innovation

Research has shown that the influencing factors of management innovation include both internal and external aspects. Internal factors such as employee training, leadership style, and organizational culture directly affect the implementation of innovation (Aristayudha et al., 2024; Ozen & Ozturk-Kose, 2023). Levkov and Trpkova Nestorovska (2019) found that organizational size, employee training, and time resources are positively correlated with management innovation, but the impact of factors such as education level is still controversial. External factors include market dynamics, technological changes, and external environmental pressures, which determine an enterprises' innovation needs and capabilities (Hamel, 2006). In the context of SMEs, the driving factors for management innovation are more complex (Ozen & Ozturk-Kose, 2023). These types of enterprises exhibit unique characteristics in leadership style, strategic management, and organizational culture due to limited resources (Dukeov et al., 2020). For example, an open innovation leadership style, an agile corporate culture, and efficient strategic management methods can help SMEs drive management innovation (Dascaliuc, 2023). However, resource constraints may hinder the innovation process, making it difficult to scale up innovative achievements.

2.2.3 Management Innovation Process

Management innovation process is complex and dynamic, aimed at optimizing operational efficiency and enhancing organizational performance by introducing new management concepts, tools, and practices (Zhang, 2022). Based on existing research findings, management innovation can be divided into four phases, each of which involves systematic methods and dynamic adjustments (Birkinshaw et al., 2008). It requires enterprises to combine external environment and internal resources to promote long-term and continuous optimization (Yadav & Dubey, 2023). Ultimately, through reflection and sharing in the theoretical stage, enterprises can construct a management innovation framework suitable for their own development, providing strong support for enhancing competitiveness and achieving sustained growth (Birkinshaw et al., 2008).

Firstly, the motivation phase identifies operational weaknesses or crises and clarifies the urgency of change (Tidd, 2023), with external environmental changes or market crises typically being the main driving factors (Hamel, 2006). By stimulating action at all levels, innovation becomes possible (Johnson & Murray, 2020). Secondly, the planning phase aims to propose innovative solutions, including strategic planning, conceptualization, and

evaluation of the best option (Johnston, 2016). This stage combines demand and external inspiration to refine the concept through repeated experimentation, laying the foundation for implementation (Robert et al., 2022). Thirdly, the implementation phase focuses on implementing the concept, overcoming obstacles through trial and error, optimizing the plan, and experimental testing to ensure the actual effectiveness of the plan (Birkinshaw et al., 2008). Clear goals and flexible adjustments are key to reducing risks and increasing success rates. Finally, the theorization phase involves summarizing experiences and reflecting on learning to form a theoretical framework and promote it (Singer, 2020). Knowledge sharing and accumulation enhance organizational learning capabilities, while establishing an innovative culture, laying the foundation for future management innovation (Binkinshaw et al., 2008).

Management innovation is not only the innovation of management concepts and practices, but also a core way to cope with complex environments and enhance competitiveness (Velikorossov et al., 2022). Unlike technological innovation, management innovation focuses more on organizational structure, process optimization, and cultural shaping (Lin et al., 2023). Its systematicity and complexity determine the high risk and difficulty of its implementation.

2.3 Senior Management Support

Senior management support refers to providing necessary resources and clear guidance to ensure smooth business operations (Damanpour & Schneider, 2006). As project initiators, the commitment of senior management is crucial for project success and employee motivation (Khaliq et al., 2024). Research has shown that senior management support plays an important role in driving entrepreneurial enthusiasm, information technology reform, and communication (Zhong & Amponstira, 2021). It can also motivate employees and influence organizational innovation and development (Damanpour & Schneider, 2006). Meanwhile, senior management promote management innovation through resource support, budget allocation, and other means, creating a favorable environment for innovative behavior (Vaccaro et al., 2010). In addition, senior managers cultivate a culture of continuous innovation by guiding change, balancing innovation enthusiasm and dynamic sensitivity (Khaliq et al., 2024). Their impact on the management innovation design phase is particularly significant (Damanpour & Schneider, 2006).

2.4 Employee Training

Employee training aims to enhance employees' skills, knowledge, and abilities, thereby promoting career development and assisting in achieving organizational goals (Rahmayanti & Misral, 2024). Research has shown that training enhances employees' decision-making, analytical, and interpersonal skills, which can help improve the level of management innovation (Sihombing et al., 2024). Innovation and learning are closely related, and training, as an important part of organizational learning, provides new skills and abilities for introducing innovation (Jia, 2023). High quality employees play a crucial role in driving

innovative practices, training enhances employees' openness and adaptability to change, and its effectiveness may vary in different cultural backgrounds (Sihombing et al., 2024). Therefore, it is necessary to optimize training content in conjunction with corporate activities and cultural factors (Rahmayanti & Misral, 2024).

2.5 Successful Adoption of Technologies

The successful adoption of technologies includes user satisfaction, system availability, perceived benefits, improvement in decision quality, and business profitability (Palad, 2023; Ferrer-Dávalos, 2023; Amadi-Echendu & De Wit, 2015). Information technology, digital transformation, and emerging technologies such as the big data, Internet of Things (IoT), and artificial intelligence are driving innovation in enterprise management, optimizing business processes, reducing costs, improving production efficiency, and accelerating product development and quality improvement (Palad, 2023). Enterprises improve decision accuracy through data-driven decision-making, driving changes in management, such as artificial intelligence and the Internet of Things have optimized data collection and analysis, changed operational models, and improved decision-making and operational efficiency (Ferrer-Dávalos, 2023). Digital management tools enable enterprises to make decisions based on data, promote the implementation of management innovation, and enhance quality control through real-time refined management (Palad, 2023). These technologies also enhance the knowledge management capabilities of enterprises, helping to improve intellectual capital and innovation output (Amadi-Echendu & De Wit, 2015). In short, utilizing these technologies can drive management innovation in enterprises, adapt to market changes, and gain competitive advantages.

2.6 Knowledge Sharing

Knowledge sharing is a process of exchanging implicit and explicit knowledge between individuals, including knowledge donation and knowledge collection (Tokal, 2022). It is crucial for driving management innovation by promoting knowledge flow within and outside the organization, enhancing innovation capabilities, and crisis response capabilities (Amanda et al., 2023; Tokal, 2022). Knowledge sharing helps to transform data into useful knowledge, thereby optimizing business processes and enhancing competitiveness (Rečičár & Tomlain, 2014). Research has shown that, there is a positive relationship between knowledge sharing and innovative behavior, as it combines intangible resources with technology to drive the adoption of management innovation (Khosravi et al., 2019). Research has shown that senior management support, employee training, and technology adoption can all promote management innovation through knowledge sharing. Specifically, senior management incentivizes innovation through resource allocation and knowledge sharing (Le, 2023); Employee training promotes knowledge transfer and sharing, strengthens teamwork and innovation (Le, 2023); The adoption of technology, on the other hand, further promotes the realization of innovative achievements through knowledge sharing mechanisms such as Artificial Intelligence (AI) (Amanda et al., 2023). Therefore, knowledge sharing plays a

mediating role between high-level support, employee training, and technology adoption, promoting the successful implementation of management innovation.

3. Conceptual Framework

The conceptual framework shown in Figure 1 is based on the innovation diffusion theory, considered with the characteristics of the management innovation process, serving as a powerful theoretical framework for elucidating the complexity of management innovation. This conceptual framework integrates senior management support, employee training, successful technology adoption, and knowledge sharing, which also contribute to shaping management innovation for SMEs in digital transformation. By combining the theory of innovation diffusion and the characteristics of management innovation process with these specific variables, a foundation has been laid for exploring the multifaceted influencing factors of management innovation in SMEs. The framework shown in Figure 1 is a valuable tool that enables managers of SMEs have a deeper understanding of management innovation. It provides a reference for developing targeted management strategies and plans.

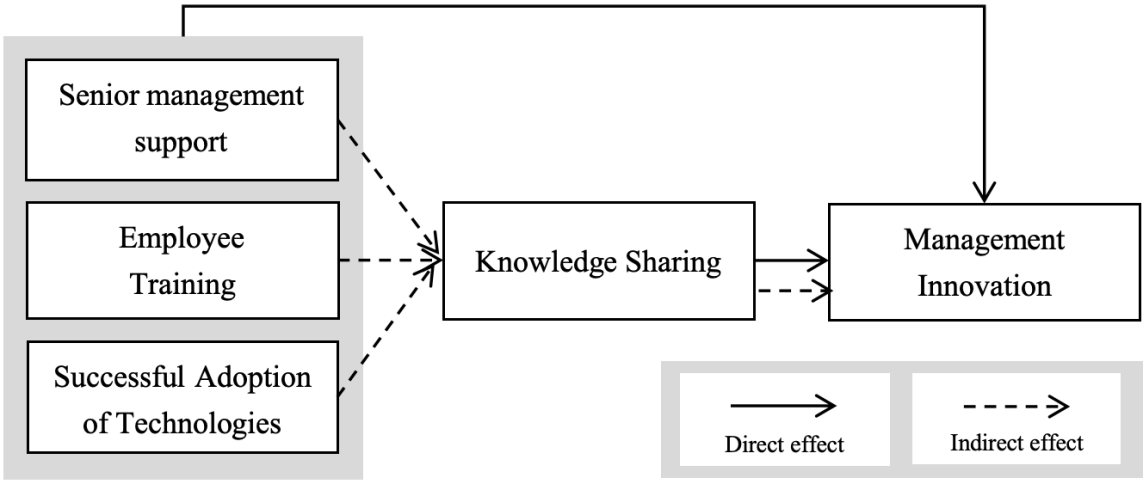

Figure 1. Conceptual framework

4. Discussion

By analyzing different literature, this study has gained a certain understanding of internal influencing factors of management innovation. Firstly, literature on management innovation emphasizes the complexity and multifaceted nature of factors that affect organizational adoption and successful innovation management practices (Yadav & Dubey, 2023; Anyigba & Addo, 2023; Ozen & Ozturk-Kose, 2023). Management innovation is not the result of a single factor, and factors such as senior management support, employee training, successful adoption of technology and knowledge sharing may all play important roles in shaping management innovation (Rahmayanti & Misral, 2024; Palad, 2023; Khosravi et al., 2019; Damanpour & Schneider, 2006). At the same time, these factors do not have a single impact on the innovation process. On the contrary, they interact with each other in a way that can

amplify or mitigate their impact on each other. For example, the support of senior management can promote the successful adoption of technology and cultivate a culture that encourages knowledge sharing (Zhong & Amponstira, 2021; Yu et al., 2021), which in turn helps employees participate in training and the development of innovative management practices. Employee training, especially when aligned with organizational goals and technical requirements, plays a crucial role in overcoming resistance to change, and ensuring the smooth implementing new management practices (Oliinyk & Tiutiunnyk, 2024; Yu et al., 2021). In addition, knowledge sharing plays a crucial role in innovation dissemination, as it enables ideas and best practices between different departments or teams to be shared, promoting incremental and radical management innovation (Omoush, 2017; Jones, 2017). These interrelated factors indicate that management innovation involves complex interactions of human, organizational, and technological elements (Yadav & Dubey, 2023). Therefore, understanding synergistic mechanism of these factors is the core of a comprehensive understanding of the management innovation process.

Secondly, although the above factors are related to management innovation, their performance and impact may vary across organizations of different sizes (Tassabehji et al., 2019). Compared to large enterprises, SMEs have unique challenges and opportunities. For example, the support from senior management is crucial in SMEs, as decision-making is often more centralized and leadership teams often play a more practical role in the innovation (Clarke et al., 2022). However, senior management in larger organizations may delegate innovation initiatives to specialized teams or departments, which may lead to more formal and structured innovation methods. (Hadjimanolis, 2022). Similarly, the scale and scope of employee training vary between SMEs and large enterprises. They often face resource constraints, which may limit the scope and depth of training programs (Pedone et al., 2023), leading to more informal training methods (Deschênes, 2022). In contrast, large enterprises can invest in comprehensive training programs to provide employees with a wider range of development opportunities (Wang & Bai, 2021). In SMEs, the successful adoption of technology also be different, because the financial and human resources required to implement new technologies may be limited (Widyaningrum et al., 2017). On the other hand, large enterprises can more easily allocate resources to adopt and integrate new technologies, thereby benefiting from economies of scale (Teerasoponpong & Sopadang, 2020). Knowledge sharing is also influenced by organizational size, SMEs often rely on tight teams and informal communication channels, which can facilitate rapid decision-making and innovation (Sołek-Borowska, 2017), but may lack structured knowledge management systems commonly found in large organizations (Tassabehji et al., 2019). These differences point out the need for tailored strategies when studying management innovation in enterprises of different sizes, as factors that influence management innovation may manifest and interact in ways that depend on organizational context.

Thirdly, although existing literature provided valuable theoretical insighted into management innovation, scholars still have divergent views on whether various factors have a positive

impact or hinder management innovation (Henao-García & Montoya, 2023). For example, the support of senior management can significantly promote management innovation, which has been confirmed by some scholars. However, there are also views that overly relying on senior management may lead to bureaucratization of innovation activities, thereby limiting flexibility (Mamajonova, 2024; Tsai et al., 2024). Similarly, although knowledge sharing practices are generally considered helpful in managing innovation, in some cases, excessive information exchange may reduce decision-making efficiency (De Moraes Silva et al., 2023; Mori, 2017). It can be seen that there is currently no consensus in the academic community on the specific roles of these factors, which need more empirical research to test and verify the specific relationships in the theoretical framework (Tsai et al., 2024; Yadav & Dubey, 2023), understand their roles in different organizational environments and clarify under which conditions these factors are driving forces and under which circumstances they may become hindering factors. A deeper understanding is needed on how these factors collectively promote or hinder management innovation (Mamajonova, 2024).

Fourthly, given the importance of these factors in creating management innovation, further research is still necessary to empirically test the causal relationship between them (Mamajonova, 2024). Structural Equation Modeling (SEM) allows researchers to simultaneously test the direct effects and indirect effects of multiple variables, providing an ideal method for examining these complex relationships (Kline, 2023). It helps to clarify how the support of senior management affects other factors and deepen understanding of potential regulatory and mediating variables, revealing their mechanisms of interaction. This empirical validation is not only crucial for advancing theoretical understanding (Kline, 2023). And develop feasible strategies for SMEs seeking digital transformation innovation. Meanwhile, the results of these studies can provide information for future policy recommendations and guide practitioners in designing more effective management innovation measures, while considering the specific needs of different types of organizations.

Finally, it is notable that the dynamics of management innovation are significantly influenced by market environments in different countries or regions (Wu et al., 2024). Although the conceptual framework provides a universal model for understanding the key factors influencing innovation in SMEs. However, regional differences are crucial and need to be considered (Lyashenko et al., 2023). For example, differences in regulatory environments, cultural attitudes towards innovation, and levels of technological infrastructure may affect the application and effectiveness of these factors. After all, SMEs in developed economies may have more opportunities to access digital technology and more mature innovation ecosystems, while SMEs in emerging markets may face unique challenges such as limited resource access and higher caution in adopting new management practices (Wu et al., 2024). In addition, Jannah et al. (2024) proposed that cultural factors, such as the emphasis on hierarchical structures or openness to knowledge sharing, may vary greatly between different regions, which will affect people's views and adoption of management innovation. Therefore, future research should focus on studying specific regions to better understand the background

factors that influence management innovation in SMEs. By studying the interactions between these factors in different market environments, researchers can provide more accurate recommendations based on the specific needs of SMEs in different geographical environments. In addition, comparative studies across multiple regions can provide valuable insights into the universality and situational dependence of management innovation.

5. Conclusion

This study aims to explore the factors influencing management innovation of SMEs in Fujian, China, focusing on management innovation, executive support, employee training, successful technology adoption, and knowledge sharing. The factors that influence management innovation in SMEs outlined in the conceptual framework are interrelated and multifaceted, requiring a deeper understanding of their complex relationships. Although existing literature provided valuable theoretical insights, it is evident that more complex empirical research is required to examine the interactions of these factors in the real world. The conceptual framework proposed in this study revealed the multifaceted impact of these factors in driving management innovation, and pointed out the complex interrelationships between them, which require further in-depth research to clarify these relationships. There is still a lack of complex empirical research to examine the interaction of these factors in practical contexts. Therefore, future research should adopt empirical methods, such as quantifying these influencing factors as indicators and using the least squares structural equation model to test the proposed theoretical hypotheses. This will help to more systematically evaluate the specific impact of various factors on management innovation and provide more reliable basis for practice. The use of advanced methods such as SEM can help reveal causal relationships between key variables, providing valuable guidance for scholars and practitioners. In addition, given the regional differences in market environments, future research should focus on examining management innovation in specific geographic contexts to capture various factors that affect the innovation process of SMEs. By addressing these gaps in the literature, we can gain a more comprehensive understanding of how SMEs can respond to digital transformation through effective management innovation.

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Authors contributions

QYL was responsible for the conceptualization, formal analysis, and writing of the manuscript. DTN and HLA contributed to the review and editing of the manuscript. All authors read and approved the final version of the manuscript. There were no special agreements concerning authorship, and all contributions were made according to the roles stated.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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No additional data are available.

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