

Received 17 June 2022, accepted 7 July 2022, date of publication 11 July 2022, date of current version 15 July 2022.

Digital Object Identifier 10.1109/ACCESS.2022.3189772

RESEARCH ARTICLE

Direct and Configurational Paths of Strategic Orientation and Business Model Innovation to Successful Enterprise Performance

HAO DONG^{1,2} AND BO WANG¹

¹Shaanxi Provincial Land Engineering Construction Group Company Ltd., Xi'an 710075, China

²School of Management, Xi'an Jiaotong University, Xi'an 710049, China

Corresponding author: Hao Dong (yihanma20191007@163.com)

ABSTRACT With the advent of the digital economy, Chinese enterprises are facing major strategic opportunities for business practice. At the same time, in-depth digitalization has greatly unlocked the potential for innovation. Business model innovation has become a key path for enterprises to gain competitive advantage. However, the innovative situation in the digital age poses new challenges to the enterprises' strategic change decision-making. How do enterprises sharply capture and quickly adapt to the dynamic changes of the environment, and further use business model innovation to achieve the strategic goal of achieving excellent performance, which is not only an important issue of concern to the theoretical scholars, but also a "secret" that enterprises' management decision-making practices are constantly exploring. This study investigates how enterprises can achieve high levels of enterprise performance under different configurations of strategic orientation and business model innovation, which introduces efficiency-centered and novelty-centered business model innovation as mediator, and a theoretical framework of "strategic orientation-business model innovation-enterprise performance" was established to explore the realization path of the strategic orientation's effect mechanism on enterprise performance. It uses 245 data from Xi'an, Chengdu, Chongqing, and other high-level enterprise managers in Northwest China as samples, besides that partial least squares structural equation modeling (PLS-SEM) and fuzzy-set qualitative comparative analysis (fsQCA) are used for empirical analysis of the data. The results provide support for the strategic orientation's role for business model innovation and enterprise performance. Furthermore, different configurations of strategic orientation and business model innovation conditions lead to better enterprise performance.

INDEX TERMS Strategic orientation, efficiency-centered business model innovation, novelty-centered business model innovation, PLS-SEM, fsQCA.

I. INTRODUCTION

The emerging digital technologies such as the industrial Internet, big data, the Internet of Things, and artificial intelligence are integrating digital as a new production factor and influencing the enterprise's innovation [1]. Changing the nature of innovation, expanding and improving traditional innovation theories [2]. The digital economy has become the most dynamic, innovative, and extensive economic form, as well as one of the main growth engines of the national economy

The associate editor coordinating the review of this manuscript and approving it for publication was Daniela Cristina Momete¹.

[3]. At the same time, a large number of business models that can create superior performance for enterprises continue to be spawned, and have become the key path to gaining advantages in the context of compressed strategic cycles [4]. In order to better adapt, respond, and reshape the environment, enterprises need to continuously carry out business model innovation under the overall strategic direction in order to win the possibility of gaining strategic initiative in market competition [5]. In fact, in the innovation context of the digital economy, the blurring of industry boundaries is gradually increasing, the heterogeneity of market demand is growing, and the uncertainty faced by enterprises is becoming more

and more significant (e.g., the frequent occurrence of uncertainties such as international trade conflict and COVID-19), which makes it more difficult for enterprises to accurately understand and judge their target markets and poses new challenges to their strategic change decision-making process [6], [7]. Therefore, how to better perceive and respond to environmental changes and break through the original internal orientation constraints of strategic orientation through the realization of business model innovation process has become a key issue to be researched and discussed by the theoretical community and corporate strategic management decision-making practice.

The academic search for the relationship between strategic orientation and enterprise performance has continued, and research has expanded the theory of strategic orientation and achieved rich and valuable results, deepening the understanding of scholars in related fields about the mechanisms of strategic orientation on enterprise performance [8]–[10]. As research progresses, scholars have found that business model innovation, as a key creative activity at the strategic level, is closely related to organizational strategic factors and that different strategic orientations have different understandings of their own strengths that influence the business model innovation process [11]. The strategic choice of the enterprise and the business model elements not only play a key role in the enterprise's performance, but also the degree of matching between them has an important impact on the level of performance [12]. However, the existing studies on the mechanisms of strategic orientation on enterprise performance are silent on how enterprises choose to carry out innovation activities through strategic orientation. The important role of business model innovation as a value capture tool in the process of strategic orientation for enterprise performance improvement has been neglected. In addition, many corporate managers are often overwhelmed when dealing with the impact of the complexity of strategic orientation or business model innovation on enterprise performance, and do not know which factors should be prioritized, what the key points are, and how to develop a path to improve enterprise performance. Therefore, exploring the mechanism of linkage matching between strategic orientation and business model innovation is of great significance for corporate managers to improve enterprise performance in the context of high environmental uncertainty.

By reviewing the literature and research on strategic orientation theory and business model innovation, and taking 245 Chinese enterprises as the research object, this study discusses the impact of strategic orientation on business model innovation and enterprise performance. In this study, fuzzy set qualitative comparative analysis (fsQCA) and partial least squares structural equation modeling (PLS-SEM) were used for data analysis. It was found that technology orientation, market orientation, and entrepreneurial orientation have a significant positive impact on business model innovation. Business model innovation has a positive impact on enterprise performance. In addition, business model

innovation mediates the relationship between technology orientation, market orientation, entrepreneurial orientation, and enterprise performance. This study helps to deepen the understanding of Chinese enterprises to realize business model innovation and enterprise performance through strategic orientation, and has profound theoretical and practical value. This paper innovatively introduces the mediating variable of business model innovation, constructs a theoretical framework of "strategic orientation-business model innovation-firm performance", deeply analyzes the key role of efficiency and novel business model innovation in the influence of strategic orientation on firm performance, further improves and enhances the explanatory power of strategic orientation on firm performance change, deepens the study of the mechanism of strategic orientation on firm performance, and thus guides and inspires the innovation exploration of Chinese firms. Exploring the mechanism of strategic orientation on enterprise performance is valuable to expand the theory and guide the practice of strategy selection. Can different types of business model innovation and how to enhance the quality of implementation of different strategic orientations to better achieve value creation and value capture? These are the key questions that need to be addressed in this paper.

The structure of the article is as follows: Section 2 summarizes the theoretical background of the article and proposes the research hypothesis. Section 3 introduces the questionnaire and variable measurement methods, analyzes the questionnaire data and measurement scale validity, and introduces the research methods. Section 4 presents the results of the study. Section 5 summarizes the conclusions of the article, discusses the theoretical and practical value of this study, and briefly describes the main limitations of this study and some possible future research directions.

II. THEORETICAL BACKGROUND AND RESEARCH ASSUMPTIONS

A. STRATEGIC ORIENTATION

Strategic orientation. The essence is the overall understanding and cognitive interpretation of the external environment and internal resources of the enterprise [13], [14]. Existing studies have defined and diversified the elements of strategic orientation through case studies or empirical studies, such as market orientation [15], [16], technology orientation [17], entrepreneurial orientation [18], innovation orientation [19], learning orientation [20], etc. In fact, in the process of enterprise strategic management, different strategic orientations at different development stages endow the enterprise with different understandings of the external environment and internal resource advantages, prompting it to select strategic priorities based on its own factor endowments and the current situation. and strategic feature design [21], [22]. Therefore, the rational choice of strategic orientation provides the possibility for enterprises to cope with market competition and turbulent and changing industry environment, obtain

existing resources and break through the constraints of current resources.

A widespread and profound digital revolution is coming [23]. Traditional enterprises are facing a borderless, interactive and uncertain environment [24], especially in reality, enterprises are faced with the dilemma of “not transforming is waiting for death, transforming is looking for death”, which has led to extensive attention and heated discussions on strategic orientation and layout among enterprise managers [25], [26]. In fact, whether an enterprise can accurately grasp the strategic orientation and truly transform its core competitive advantage into enterprise performance depends on the degree to which it obtains resources through continuous innovation activities: a market-oriented enterprise can meet the ever-changing Customer needs, help them acquire intangible resources to build core capabilities and competitive advantages; technology-oriented enterprises can continuously build excellent technology-sensitive capabilities, high-quality core technical knowledge, flexible module design mechanisms through research and development and application of cutting-edge technologies, and continuously develop new products and services with an efficient allocation of resources [27]; entrepreneurially oriented enterprises can maintain a turbulent environment by updating existing behavioral practices and pursuing new growth opportunities or new business areas dissimilarity in [28]. Therefore, this paper draws on the model constructed by Zhou *et al.* [29] on the role of strategic orientation (market orientation, technology orientation, entrepreneurial orientation) and environmental factors on breakthrough innovation (technology-based and market-based). Mainly select the key dimension elements of market orientation, technology orientation and entrepreneurial orientation. The researches all advocate the opening of new ideas, but the three strategic orientations with different focus on the strategic direction, and their influence on the business model innovation and performance improvement process of enterprises.

Existing research conclusions on the role of strategic orientation on enterprise performance are divergent. Some scholars have pointed out that strategic orientation can help enterprises focus more clearly on customer positioning, integrate resource systems, and formulate business scope [30]–[32]. Therefore, it has a significant positive impact on improving organizational performance [33]. However, some studies have pointed out that the discussion on the influence of strategic orientation and enterprise performance focuses more on general dynamic situations, and in some specific situations, the impact of strategic orientation on enterprise performance may be different to a certain extent. For example, there is no significant correlation between entrepreneurial orientation and enterprise performance in specific situations, and there may even be a negative correlation. In addition, the view that “strategic orientation does not have a direct positive impact on performance, but affects performance through the mediating transmission mechanism of certain variables” has been recognized by many scholars, and the research focuses

on organizational learning, technological innovation, organizational Capability resources [34]–[36]. It is added as an intermediary variable into the relationship model between strategic orientation and enterprise performance to explain the divergent phenomenon in the existing research on the impact of strategic orientation on enterprise performance. However, how to achieve the improvement of performance level through strategic orientation needs further research and discussion.

B. BUSINESS MODEL INNOVATION

Business model. It is the behavioral process and dynamic adjustment mechanism by which a firm allocates internal and external resources and arranges related activities [37], reflecting the logical design of what and how it integrates resources to achieve its core goal of profit capture in business practice. Although there are differences in the understanding of the meaning of business model innovation based on different perspectives such as technological innovation [38], strategy [11], and marketing [39]. However, there is a consensus on the idea that business model innovation can enhance the core competencies of enterprises to achieve superior performance. Habtay [40] defines and classifies business model innovation based on its general characteristics. The paper draws on Zott and Amit’s [12] dimensional analysis based on the general characteristics of business model innovation, and classifies business model innovation into efficiency-centered business model innovation and novelty-centered business model innovation. Efficiency-centered business model innovation. It improves the current business model to reduce the transaction costs of enterprises, mainly by reducing the complexity of transactions between enterprises and various participants, reducing the information asymmetry between the transaction activities and various stakeholders, and reducing the errors in the transaction process. Novelty-centered business model innovation. It emphasizes that enterprises should link up with new trading parties in a wider scope, adopt new ways to conduct transactions with various parties, design and improve new trading mechanisms and incentives, etc. Digital technologies have changed the underlying assumptions of innovation management problems, endowing innovation processes and innovation outcomes with interactive and dynamic characteristics [2]. Research on the intermediary role of business model innovation is a hot topic in academic circles, mainly focusing on integration capabilities and enterprise performance [41], open innovation and the growth of new enterprises [42], organizational duality and open innovation performance [43]. The above study discusses the mediating effect of business model innovation and analyzes the key role of business model innovation as an important means for enterprises to create value through changing their original business model to gain competitive advantage, and to promote their performance improvement and entrepreneurial growth.

The realization of business model innovation is driven by the strategic orientation of the company, which defines the direction and use of its resources and capabilities. On the

one hand, it can influence the choice of the activity model that can achieve strategic goals by coordinating with other stakeholders. On the other hand, it can facilitate the strategic practice of business model innovation by understanding value creation and grasping market operations and market relationships to adjust and reconfigure existing value chains and other activity processes. However, existing studies on the relationship between strategic orientation and business model innovation are scattered and mainly explore the role of the relationship between it and business model innovation based on one dimension of strategic orientation [33], [44]. Based on the theoretical logic that a company's strategic orientation choice can provide direction for business model innovation, and it thus becomes a pragmatic way and key path for it to achieve its strategic goals, focusing on a simple linear relationship between strategic orientation and corporate performance may ignore the real mechanism of action between the two, thus obscuring or misinterpreting the essence of the research phenomenon to some extent. At the same time, since the results of existing studies on the relationship between strategic orientation and corporate performance are somewhat divergent, it is necessary to explore the mechanism of the role of strategic orientation on corporate performance in depth by introducing business model innovation as a mediating variable.

In conclusion, it is important to explore the mechanism of strategic orientation on enterprise performance to expand the theory and guide the practice of strategy orientation, but how can enterprises with different factor endowments make strategic orientation choices according to their own characteristics when facing different situations? Can different types of business model innovation and how to enhance the quality of implementation of different strategic orientations to better achieve value creation and value capture? These are the key questions that need to be addressed in this paper.

C. DIGITAL TRANSFORMATION

Digital transformation is a strategic issue for companies of all organizational forms and sizes, and it is not limited to a certain category of companies such as innovative companies, digital start-ups or high-tech companies. The digital transformation path enables companies to go beyond a one-dimensional growth model and win greater scope for growth in value creation and capture by changing their value proposition and business logic [45], [46]. With the spread and adoption of digital technologies, the way companies interact with consumers has fundamentally changed [47], requiring a new assessment of the previous value proposition. Through digital technologies such as the Internet of Things, blockchain, and cloud computing, companies have been able to accurately collect huge amounts of data and achieve the requirement to identify and continuously track diverse consumer needs in a timely manner. In order to deeply respond to this feedback, companies also have the opportunity to use digital transformation to revolutionize external interactions, communication patterns, and linkages [48] and to evolve collaboratively

with upstream and downstream actors. With the continuous expansion of enterprise boundaries and the gradual construction of digital ecological platforms, inefficient links in the original organizational structure will be effectively improved and the organization will be stimulated to upgrade to an agile and highly resilient structural model. In turn, digital transformation gives enterprises an efficient way to realize the diversified value creation methods and opens up more channels for enterprises to improve performance and revenue.

For the growth and survival of companies themselves, digital transformation brings lasting vitality. Resource-based theory assumes that resource differences exhibited between organizations are the root cause of the performance gap, and the resource constraint problem has been an important challenge that competing firms have sought to address. The embedding of digitalization helps firms to break down the barriers of physical resources and effectively alleviate the resource constraint problem [49]. For the improvement of the resource level within the enterprise, the new resources generated by the application of digital technology will complement the existing resource base of the enterprise in tangible or intangible ways, for example, the introduction of digital equipment and technologies, and the resulting increase in production efficiency and the diffusion effect of product and service innovations will expand the resource pool of the enterprise and improve the efficiency of resource allocation. In addition, the strength of resource conservation mechanisms is important for firms to achieve sustained competitive advantage. However, in the information age, enterprises' access to resources is becoming more transparent and their resources are more easily imitated, and many enterprises simply do not have the protection mechanism to maintain their competitive advantages. However, digital transformation offers new ideas and ways for companies to build heterogeneous resources and resource protection mechanisms. The new approach brought by digital technology makes internal resources more closely linked, and through internal linkages, many single resources that were originally independent can form their own unique resource network. Moreover, with the support of digital capabilities, the combination of resources from the resource network will greatly increase the difficulty of imitation and reduce the possibility of external imitation as the frequency and depth of the problem increases. The cross-border resource network formed by internal and external links provides complementary support for the enterprise's core resources on the one hand, and increases the added value of existing resources on the other, giving them more paths to realize economic value.

D. RESEARCH ASSUMPTIONS

1) STRATEGIC ORIENTATION AND CORPORATE PERFORMANCE

Enterprise strategic orientation has certain social complexity, irreplaceability and reticence. An effective and precise strategic orientation can lead to the enhancement of their

competitive advantage through rational allocation of resources and lead to the emergence of new products, services and technologies. It brings a new paradigm for enterprises to achieve success [50]. First, market-oriented enterprises pay more attention to market information such as customers, competitors, and environmental factors, and capture market information more quickly. On the one hand, it can effectively guide and motivate enterprises to make strategic behavioral choices based on creating value for customers, and to build competitive advantages by coordinating customers, competitors, and inter-functional coordination within the company. On the other hand, it can fully interpret market information and accumulate market knowledge [51], and then develop new products or services based on the application of market knowledge to achieve the strategic goals of customer satisfaction and corporate performance improvement [52]. Second, technology orientation motivates enterprises to use advanced technology in the development of new products by actively developing and adopting newer or more advanced technologies to design better, more innovative and functionally superior products for customers. In addition, the increasing speed of new technology integration creates important conditions for the continuous development of new products and services [53]. Firms use technological advantages to further build potential competitive advantages that are difficult for competitors to imitate [54]. Finally, operators of entrepreneurially oriented enterprises advocate actively seeking new business opportunities for growth and tend to use first-mover advantages to introduce new products or services into the market ahead of competitors, and to seize the initiative in the market by establishing industry standards and dominating major distribution channels to gain competitive advantage and improve corporate performance. Consequently, we propose the following hypothesis:

Hypothesis 1a (H1a). Market orientation positively affects enterprise performance.

Hypothesis 1b (H1b). Technology orientation positively affects enterprise performance.

Hypothesis 1c (H1c). Entrepreneurial orientation positively affects enterprise performance.

2) STRATEGIC ORIENTATION AND BUSINESS MODEL INNOVATION

Market orientation and business model innovation. The market competition in the context of China's transitional economy is unprecedentedly fierce. Market-oriented enterprises have rich market knowledge and can carry out information search activities in current or cross-border fields when facing new market opportunities. It can focus on the existing needs of customers and further predict their continuous and dynamic changing needs, understand and master the key advantages, core capabilities and development strategies of competitors, and then fully allocate and systematically integrate organizational resources based on the logic of customer value creation. In the process of business model innovation, market orientation can improve a firm's understanding of

customer preferences, market product substitutes and complements, and fully consider customer value propositions and competitor advantages [29]. At the same time, market orientation can tap the key elements of the company's innovation direction, which helps enterprises identify new business opportunities, locate new target markets, and introduce new value propositions, so as to establish new distribution channels and even new value creation and delivery systems [55]. For efficiency-centered business model innovation, market orientation is more reflected in the investment and analysis of market research. Enterprises quickly capture customer demand information in the market, and seize or create market opportunities that can gain competitive advantages for them to respond to changes in market demand. On the one hand, it can increase its added value in the process of operating activities by thinking about the existing resource combination plan to reduce costs or improve operational processes. On the other hand, through the rapid aggregation of market demand and the continuous improvement of transaction efficiency with partners, the effective integration and optimal allocation of internal and external resources can be achieved, thereby promoting the efficient innovation of business models. For novelty-centered business model innovation, the active interaction with stakeholders in the market advocated by market orientation is an important channel for enterprises to obtain market information, by quickly collecting, processing, and understanding key market information, as well as analyzing and predicting market demand. On the one hand, it can promote extensive cooperation between enterprises and new partners, and continuously provide new product or service combinations to tap and meet market and consumer needs. On the other hand, by making full use of current resources and effectively optimizing the allocation, the value-added value in the original market can be obtained, thereby promoting the innovation and development of novel business models. Consequently, we propose the following hypothesis:

Hypothesis 2a (H2a). Market orientation positively affect efficiency-centered business model innovation.

Hypothesis 2b (H2b). Market orientation positively affect novelty-centered business model innovation.

Technology orientation and business model innovation. Technology orientation reflects a firm's ability and willingness to learn new technologies [56] and advocates the extraction of technological knowledge, the enhancement of technological diversity, and the strengthening of technological capabilities. In fact, diversification of technologies and key technological capabilities provide additional developmental ideas for the design of a firm's technology portfolio and process transformation of products and services [57]. In the process of business model innovation, technology orientation can increase an organization's reserve of technology or knowledge and enhance its ability to discover new knowledge combinations with business value [35], which not only helps to enhance its understanding of technology inside and outside the industry, but also provides it with new solutions to problems, and business model innovation becomes an

important vehicle for it to capture the benefits of technological change. New technologies such as industrial integration and industrial modularization continue to emerge, effectively promoting the business model innovation process of enterprises in the ICT field. In addition, the construction of new business models in the process of technological innovation also greatly increases the possibility of enterprises to achieve excellent performance [22]. For efficiency-centered business model innovation, on the one hand, technology orientation of enterprises can change the articulation and coordination mode of business model elements such as value proposition, key activities, distribution channels and profit model [58]. On the other hand, continuous technology investment drives trading platform optimization and industrial technology innovation, which enables enterprises to improve and innovate the original value chain structure in the process of value creation and acquisition by reducing transaction costs and enhancing transaction efficiency [59]. To a certain extent, it enhances the efficiency of resource flow and provides strong support for efficiency-centered business model innovation. For novel business model innovation, the use of new technologies enhances firms' autonomy in partnerships and can lead to the acquisition of new value propositions and access to new partners, thus optimizing the design and use of new transaction mechanisms and innovating existing industrial ecosystems. Value-added acquisition can also be achieved by converting and upgrading potential resources within existing markets. Consequently, we propose the following hypothesis:

Hypothesis 3a (H3a). Technology orientation positively affect efficiency-centered business model innovation.

Hypothesis 3b (H3b). Technology orientation positively affect novelty-centered business model innovation.

Entrepreneurial orientation and business model innovation. Entrepreneurial orientation reflects a set of organizational activities in which key managers capture and pursue new opportunities in the marketplace through innovative, risk-taking and proactive behavior [60]. The tendency of firms to pursue new opportunities, to adopt demand response strategies quickly, and to be willing to invest valuable resources in risky project activities despite uncertainty about future returns [61]. In an innovation environment where the pace of technological change is accelerating and operating costs are rising, entrepreneurially oriented enterprises are able to plan their vision, quickly scan the external environment to capture market information, and take advantage of business opportunities to develop new products and services in order to gain a first-mover competitive advantage [62]. In the process of business model innovation, enterprises need to change the elements of their existing business models to maintain the competitive advantage of their existing business models. Since entrepreneurship orientation advocates the performance level as the ultimate measure of the existing operating model, it helps enterprises to break through the existing framework, which leads them to improve the business model innovation process and propose a better customer value proposition [63], and then integrate resources

more effectively to achieve the creation, delivery and capture of corporate value. For efficiency-centered business model innovation, entrepreneurially oriented enterprises can shape the perception of current or potential markets and their trends, and further enhance their ability to provide solutions using new technologies by leveraging and extending existing technologies and knowledge to break through resource constraints in a volatile environment [64]. As a result, enterprises are able to optimize their transaction mechanisms and operational processes, and are committed to enhancing the convergence of market demand, improving the efficiency of transactions between partners, and optimizing the integration of internal and external resources to promote efficiency-centered business model innovation [5]. Innovation for novel business models, entrepreneurship is driven by enterprises to actively search and quickly respond to market information, and grasp innovation opportunities. On the one hand, the existing industrial ecosystems can be extended and refactored by developing new markets, cultivating new technical knowledge, and building the ability to provide solutions. On the other hand, value innovation can be achieved by using innovative transaction mechanisms to accelerate resource flow and conversion, expand the joint entity or use optimized enterprise transaction mechanisms and incentives. Consequently, we propose the following hypothesis:

Hypothesis 4a (H4a). Entrepreneurial orientation positively affect efficiency-centered business model innovation.

Hypothesis 4b (H4b). Entrepreneurial orientation positively affect novelty-centered business model innovation.

3) THE MEDIATING ROLE OF BUSINESS MODEL INNOVATION

Studies related to strategic orientation, business model innovation and firm performance have shown that strategic orientation can influence changes in firm performance either directly or indirectly through certain mediating factors. Based on the theoretical logic that the choice of strategic orientation can provide direction for business model innovation practice and that business model innovation can explain the inner mechanism of corporate value transformation. Therefore, business model innovation becomes an important tool and key path to achieve strategic goals and create superior performance. The impact of strategic orientation on firm performance needs to be implemented through actions to be gradually revealed, so it is necessary to combine strategic choices with business models to analyze the organizational action characteristics of business model innovation in the process of strategic orientation on firm performance, and then to analyze the differences in performance among firms. Zott and Amit [12] also showed that both strategic choice and business model elements play a key role in firm performance, and the degree of matching between them is important for the degree of matching between them has a significant impact on the level of performance.

By developing a business model that matches the current strategic orientation, enterprises can effectively respond and

adapt to the complex and changing external environment, reconfigure or even create a new environment that is more suitable for their survival, and enhance their adaptability to dynamic changes in the market and their resilience to innovation risks [65], thus transforming business opportunities into corporate performance, truly achieving value capture and enhancing their core competitive advantage. On the one hand, business model innovation can promote corporate profit creation by optimizing the value creation process and expanding value [66]. On the other hand, it is possible to adjust the organization's structure and management mode, by enhancing its bargaining capacity in the partner network, making the relevant partners and participants in the enterprise transaction to achieve a profitability in a short period of time [67]. Therefore, enterprises need to build unique value propositions, improve the efficiency of their business processes, and refine their profit models under the guidance of a strategic orientation, so as to continuously develop core competencies that are difficult to be imitated or surpassed [68]. On the one hand, the advantages of efficiency-based business model innovation are mainly to strengthen the relationship between the company and its partners, increase the negotiation and bargaining power of the company, and further expand its competitive advantage. At the same time, a new business model focused on improving efficiency provides information sharing among the stakeholders in the business model and further aggregates market demand, thus greatly reducing transaction costs and enabling the improvement of business performance [12]. On the other hand, novel business model innovation can explore market and consumer demand, create new market space to get more potential consumers, partners and suppliers, ultimately through effective optimization to configure the current resources to achieve the benefits of the organization boundary [69]. At the same time, novel business model innovation has prompted enterprises to design new trading mechanisms, providing new transaction incentives, not only to locate consumers in the original market, but also partners in a larger range. Develop a new customer experience, brand new trading method to improve customer purchase will, build a new value creation process, and achieve potential resources value upgrade in existing markets and achieve higher performance levels. Consequently, we propose the following hypothesis:

Hypothesis 5 (H5). Efficiency-centered business model innovation positively affect enterprise performance.

Hypothesis 5a (H5a). Efficiency-centered business model innovation mediates the link between market orientation and enterprise performance.

Hypothesis 5b (H5b). Efficiency-centered business model innovation mediates the link between Technology orientation and enterprise performance.

Hypothesis 5c (H5c). Efficiency-centered business model innovation mediates the link between entrepreneurial orientation and enterprise performance.

Hypothesis 6 (H6). Novelty-centered business model innovation positively affect enterprise performance.

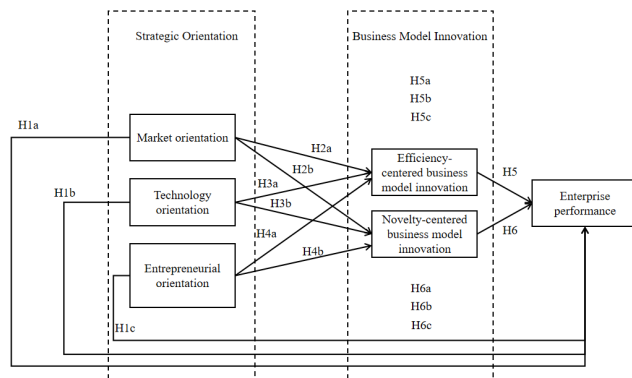


FIGURE 1. Research model.

Hypothesis 6a (H6a). Novelty-centered business model innovation mediates the link between market orientation and enterprise performance.

Hypothesis 6b (H6b). Novelty-centered business model innovation mediates the link between Technology orientation and enterprise performance.

Hypothesis 6c (H6c). Novelty-centered business model innovation mediates the link between entrepreneurial orientation and enterprise performance.

We propose the following research model (Figure 1) to describe the hypothetical relationship between strategic orientation, business model innovation, and enterprise performance.

III. METHODS

A. EQUATIONS

To test the research model, we used a questionnaire survey to collect data. First, we referred to previous relevant studies and preliminarily determined the measurement method of the research variables. Then, we used a small sample pre-survey to analyze the reliability and validity of the questionnaire, and modified and deleted the specific measurement variables. Finally, our questionnaire included three independent variables, measured by four items, two intermediary variables, measured by four items, and a dependent variable, measured by 5 items. All 25 items were measured with a 7-point Likert scale (1 = very disagree, 7 = very agree). Table 1 lists the variables and their measurement methods used in this study.

B. DATA

To empirically test our hypotheses, data were collected from enterprises in Northwest China in 2021. In order to acquire a representative sample, we conducted a survey with the most authoritative local administrative institution through the enterprises and leaders of the author of this article. This institution is responsible for investigating local industry development and digitization for the government. Through cooperation with this institution, we obtained a sample database of 1600 domestic enterprises. The officials in this institution provided us the contact information of these enterprises. Initially, we organized a forum to invite enterprises to voluntarily participate in this research and to amend

TABLE 1. Survey variables and measures.

| Variable | Measurement item | Sources |
|---|--|--|
| Market orientation | The enterprise is committed to creating customer value | Narver and Slater 1990[86] |
| | The enterprise is able to respond quickly to competitor behavior | |
| | The enterprise can effectively share market information among various functional departments | |
| | Enterprise's market competition strategy is jointly developed by various departments | |
| Technology orientation | The enterprise considers the technological leadership of new products very important | Spanjol et al.[21] |
| | The enterprise strives to become the industry's early application of new technology product providers | |
| | The enterprise strives to make the production process level of products in the industry in the leading | |
| | The enterprise diversifies product functions to meet more customer needs | |
| Entrepreneurial orientation | In the last three years, the enterprise has launched many new products or services | Wiklund and Shepherd 2005[87] |
| | The enterprise attaches great importance to R&D activities and pursues technology or service leadership and innovation | |
| | The enterprise often examines the industry development trend, takes the lead in grasping the opportunity, and responds to the changes early. | |
| | In order to achieve business goals, enterprises tend to act more boldly and quickly. | |
| Efficiency-centered business model innovation | The business model of an enterprise provides new products, services, and information or a new combination of the three | Zott and Amit 2012 [12] |
| | The business model of the enterprise has introduced new participants | |
| | The business model of enterprises provides new transaction incentives for participants | |
| | The diversity and quantity of participants and/or commodities in the business model of enterprises are unprecedented | |
| Novelty-centered business model innovation | The business model of the enterprise is novel | Zott and Amit 2012 [12] |
| | The business model of the enterprise creates new profit points | |
| | Business models for enterprises create new ways to make money | |
| | The business model of the enterprise uses an innovative trading approach | |
| Enterprise performance | The sales growth rate of enterprises is higher than that of industry competitors | Murphy et al. [88] Chandler and Hnaks 1993[89] |
| | The employee growth rate of enterprises is higher than that of industry competitors | |
| | The market growth rate of enterprises is higher than that of industry competitors | |
| | The financial performance of enterprises is higher than that of industry competitors | |
| | The operational performance of enterprises is higher than that of industry competitors | |

our questionnaire through sharing of useful experience at the meeting. Then we invited participating executives to answer our questionnaire. For the respondents' concerns and potential response deviations, the academic purpose of the research was emphasized in the questionnaire. We also mentioned that the confidentiality of individual respondent's responses would be ensured and only the summary report would be submitted to the institution.

In this paper, the scale was selected by combining the widely accepted and cited scale literature with the study context, and the questionnaire items were revised according to the pretest analysis to form the official measurement scale. (1) Market orientation is mainly based on Narver and Slater's (1990) study, and is measured in three dimensions: customer orientation, competitor orientation, and cross-sectoral coordination, with a total of four questions. (2) Technology orientation is mainly based on the scale of Spanjol *et al.* (2011),

with 4 items. (3) Entrepreneurial orientation is measured by Wiklund and Shepherd (2005) in three dimensions: innovativeness, risk-taking, and proactivity, with four items. (4) Business model innovation is measured by Zott and Amit's (2012) efficiency and novelty business model innovation scales, with 8 questions. (5) Corporate performance is measured by the scale developed and modified by Murphy *et al.* (1996) and Chandler and Hanks (1993), which measures corporate performance in two dimensions: financial performance and growth performance. (6) Firm age, industry category, firm nature, and firm size were used as control variables. We administered the questionnaire online to employ two research assistants to make follow-up phone calls to facilitate the data collection process in the period from May to August 2021. Finally, 256 firms responded to online survey. A total of 245 surveys were fully completed, corresponding to a response rate of 15.31%. Table 2 reports the summary characteristics of the responding enterprises. The study conducted procedural controls for common method bias effects including anonymous measurement and balanced item order during the questionnaire measurement process. In addition, the Harman single factor method was used to test the sample data for the level of common method bias. Factor analysis was done on all question items of this study's questionnaire together, and the first principal component obtained at unrotated accounted for only 42.206% of the loadings. The results of factor analysis did not show that only one factor or a single factor explained most of the variance, so the problem of common method bias in this study's data was not considered significant. In this study, the sample data were statistically analyzed mainly according to the characteristics of enterprise age, industry category, and enterprise size. In terms of firm age, the sample covers firms of different ages ranging from less than 5 years to more than 25 years. In terms of industry categories, the sample includes high-tech industries, traditional manufacturing industries, transportation and other industries, among which manufacturing, service and ICT industries are the most distributed, while other industries are more evenly distributed. In terms of enterprise size, those with less than 500 employees accounted for 64.5% of the total sample.

C. DATA ANALYSIS

We used both Partial Least Squares Structural Equation Modelling (PLS-SEM) and fuzzy-set Qualitative Comparative Analysis (fsQCA), specifically the SmartPLS 3.0 software [70] and fsQCA 3.0 [71]. These two statistical techniques are based on different principles and have different focuses [72]. SEM analyses the net impact of the independent variable on the outcome as well as the competition among independent variables in explaining the dependent variable; furthermore, it is based on the rules of linearity, unifinality and additive effects [73]. On the contrary, fsQCA explores combinatorial effects and assumes the existence of asymmetries between variables, equifinality (different routes can generate the same outcome), multi-finality (identical

TABLE 2. Demographic characteristics (n = 245).

| Characteristics | Samples | Percent (%) |
|---|---------|-------------|
| Industry | | |
| Service activities and utilities | 62 | 25.3 |
| Manufacturing | 59 | 24.1 |
| ICT | 55 | 22.4 |
| Trade and retail | 31 | 12.7 |
| Agri-food | 19 | 7.8 |
| Financial, insurance and banking activities | 14 | 5.7 |
| Others (e.g., R&D, Construction, Transportation, Real Estate) | 5 | 2.0 |
| Employee | | |
| 1-99 | 39 | 15.9 |
| 100-299 | 78 | 31.8 |
| 300-499 | 41 | 16.7 |
| 500-999 | 87 | 35.5 |
| Firm age | | |
| < 5 years | 45 | 18.4 |
| 5-9 years | 114 | 46.5 |
| 10-24 years | 62 | 25.3 |
| > 25 years | 24 | 9.8 |

elements can generate different outputs) and conjunctural causation [73], [74]. In contrast to other QCA methods, in the case of fsQCA the variables are on a fuzzy (continuous between 0 and 1) and not on a dichotomous (binary) scale. Furthermore, it seeks combinations (configurations) of causal conditions leading to a specific outcome, rather than simple correlations between constructs [75].

IV. RESULTS

A. EVALUATION OF MEASUREMENT MODEL

The results confirmed that the measurement model satisfies all general requirements (see table 3). First, all the standardized factor loadings of all the first-order and second-order constructs are above the minimum value of 0.733 [76]. Second, the Cronbach's alpha scores ranged between 0.784 and 0.861 while the composite reliability scores ranged between 0.86 and 0.937 which are above the recommended value of 0.70 indicating adequate construct validity. In addition, all the constructs have an AVE value above 0.50, suggesting that latent variables achieved convergent validity. Finally, this study follows three approaches to assess the discriminant validity i.e., (1) Fornell-Larcker criterion, (2) cross

loading, and (3) the heterotrait-monotrait ratio of correlations (HTMT).

The correlation matrix in Table 4 shows that for each pair of constructs, the AVE square root of each construct is higher than the absolute value of their correlation [76]. The results of cross loading show that all items are loaded higher on their respective constructs than on the other constructs and the cross-loading differences are much higher than the suggested threshold of 0.1. In all cases the HTMT values are below the threshold of 0.85. These results confirmed that the discriminant validity is present in this study.

B. EVALUATION OF SYMMETRICAL MODELING

This study followed Hair et al. [77] to estimate the structural model. First, the results show minimal collinearity in the structural model as all VIF values are far below the common cutoff threshold of 5 to 10 Hair et al [77]. Second, following the rules of thumb, the R^2 values of ECBMI (0.480), NCBMI (0.457) and EP (0.536) exceed the minimum value of 0.10 recommended by Hair which is a satisfactory level of predictability as shown in Table 5. Similarly, results from blindfolding with an omission distance of 6 yield Q^2 values well above zero (Table 5). Thus supporting the model's predictive relevance in terms of out-of-sample prediction. Further analysis of the composite-based standardized root mean square residual (SRMR) yields a value of 0.068, which confirms the overall fit of PLS path model [78]. Applying the bootstrapping procedure (5000 bootstrap samples; no sign changes) provides the p-values as well as the corresponding 95% bias-corrected and accelerated (BCa) bootstrap confidence intervals (Table 5). The empirical results support the vast majority of hypothesized path model relationships among the constructs.

C. FUZZY SET-QUALITY COMPARATIVE ANALYSIS (fsQCA) APPROACH

FsQCA uses Boolean algebra to generate combinations of causal conditions leading to an outcome. Central to the fsQCA approach are the calibration procedure and the truth table analysis. The calibration is a transformation process consisting in converting conventional measures into fuzzy sets. The truth-table analysis produces three different solution terms: (1) complex, (2) parsimonious, and (3) intermediate [74]. Fiss [71] propose the mix of the last two solutions to bring out core and peripheral conditions, associated with the outcome of interest. Core conditions are solutions belonging to both parsimonious and intermediate that show a strong causal relationship with the outcome, whereas peripheral conditions are solutions appearing only in the intermediate solutions and presenting a weaker relationship with the outcome.

1) CALIBRATION PROCEDURE

Fuzzy set calibration is a key operation in the fsQCA. Calibration refers to the process of assigning set membership to cases and establishing a relationship between variable values and

TABLE 3. Reliability and validity.

| Variable | Item | Convergent Validity | | | Cronbach's Alpha | Multicollinearity VIF |
|---|-------|---------------------|-----------------------|-------|------------------|-----------------------|
| | | Cross Loadings | Composite Reliability | AVE | | |
| Market orientation | MO1 | 0.758 | 0.864 | 0.613 | 0.796 | 1.765 |
| | MO2 | 0.822 | | | | 2.083 |
| | MO3 | 0.767 | | | | 1.647 |
| | MO4 | 0.784 | | | | 1.326 |
| Technology orientation | TO1 | 0.793 | 0.860 | 0.607 | 0.784 | 1.516 |
| | TO2 | 0.792 | | | | 1.589 |
| | TO3 | 0.796 | | | | 1.655 |
| | TO4 | 0.733 | | | | 1.467 |
| Entrepreneurial orientation | EO1 | 0.739 | 0.877 | 0.640 | 0.814 | 2.026 |
| | EO2 | 0.806 | | | | 2.303 |
| | EO3 | 0.834 | | | | 1.981 |
| | EO4 | 0.818 | | | | 1.878 |
| Efficiency-centered business model innovation | ECMI1 | 0.821 | 0.884 | 0.657 | 0.826 | 1.736 |
| | ECMI2 | 0.829 | | | | 1.875 |
| | ECMI3 | 0.796 | | | | 1.692 |
| | ECMI4 | 0.796 | | | | 1.709 |
| Novelty-centered business model innovation | NCMI1 | 0.842 | 0.905 | 0.705 | 0.861 | 2.113 |
| | NCMI2 | 0.858 | | | | 2.208 |
| | NCMI3 | 0.820 | 0.937 | 0.749 | 0.826 | 1.945 |
| | NCMI4 | 0.839 | | | | 1.841 |
| Enterprise performance | EP1 | 0.891 | 0.937 | 0.749 | 0.826 | 3.758 |
| | EP2 | 0.914 | | | | 4.348 |
| | EP3 | 0.765 | | | | 1.921 |
| | EP4 | 0.859 | | | | 2.946 |
| | EP5 | 0.892 | | | | 3.634 |

fuzzy set membership by locating points [71]. Combined with the actual situation of the research data, this study selected the 95% quantile, median (50%), and 5% quantile of the

TABLE 4. Discriminant validity - Fornell-Larcker Criterion and Heterotrait - Monotrait Ratio.

| Variables | Mean | S.D | 1 | 2 | 3 | 4 | 5 | 6 |
|--|------|------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1. Efficiency-centered business model innovation (ECBMI) | 4.91 | 1.16 | 0.810 | <u>0.719</u> | <u>0.764</u> | <u>0.571</u> | <u>0.783</u> | <u>0.630</u> |
| 2. Enterprise performance (EP) | 5.03 | 1.08 | 0.629** | 0.866 | <u>0.721</u> | <u>0.465</u> | <u>0.778</u> | <u>0.553</u> |
| 3. Entrepreneurial orientation (EO) | 5.00 | 1.20 | 0.636** | 0.624** | 0.800 | <u>0.544</u> | <u>0.722</u> | <u>0.605</u> |
| 4. Market orientation (MO) | 5.47 | 0.98 | 0.494** | 0.417** | 0.462** | 0.783 | <u>0.574</u> | <u>0.648</u> |
| 5. Novelty-centered business model innovation (NCBMI) | 4.76 | 1.12 | 0.661** | 0.697** | 0.623** | 0.494** | 0.840 | <u>0.570</u> |
| 6. Technology orientation (TO) | 5.05 | 1.22 | 0.511** | 0.471** | 0.482** | 0.529** | 0.478** | 0.779 |

(Note) Significant level:p<0.10;*p<0.05;**p<0.01;***p<0.001, Bold diagonal entries are square root of AVEs, Heterotrait-Monotrait ratios(HTMT)(Underlined) are below 0.85

TABLE 5. Significant testing results of the structural model path coefficients.

| | Path coefficient | t-value | p-value | 95% BCa confidence interval | Conclusion |
|-------------|------------------|---------|---------|-----------------------------|---------------|
| ECBMI -> EP | 0.299 | 3.535 | 0 | (0.120,0.447) | H5 supported |
| EO -> ECBMI | 0.459 | 6.379 | 0 | (0.314,0.596) | H4a supported |
| EO -> EP | 0.365 | 5.172 | 0 | (0.236,0.509) | H1c supported |
| EO -> NCBMI | 0.457 | 6.846 | 0 | (0.323,0.581) | H4b supported |
| MO -> ECBMI | 0.179 | 2.671 | 0.008 | (0.049,0.313) | H2a supported |
| MO -> EP | 0.155 | 3.543 | 0 | (0.065,0.239) | H1a supported |
| MO -> NCBMI | 0.204 | 2.987 | 0.003 | (0.070,0.335) | H2b supported |
| NCBMI -> EP | 0.499 | 8.636 | 0 | (0.383,0.608) | H6 supported |
| TO -> ECBMI | 0.195 | 3.109 | 0.002 | (0.070,0.313) | H3a supported |
| TO -> EP | 0.133 | 2.91 | 0.004 | (0.049,0.227) | H1b supported |
| TO -> NCBMI | 0.15 | 2.252 | 0.024 | (0.025,0.282) | H3b supported |

SRMR composite model = 0.068
R²_{ECBMI}=0.480; Q²_{ECBMI}=0.300
R²_{NCBMI}=0.457; Q²_{NCBMI}=0.307
R²_{EP}=0.536; Q²_{EP}=0.395

sample data as the three calibration points of full membership, crossover point, and full non-membership of the result and conditional variables. The results and calibration information for each conditional variable are listed in Table 6.

2) FSQCA SOLUTION

Before the condition configuration analysis, it is necessary to check the “necessity” of each condition individually. The necessary condition leads to the occurrence of the result, but its existence does not guarantee the inevitable existence of

TABLE 6. Calibration positioning points of case variables.

| Variables | | Locating point | | |
|-----------------------|-------|-----------------|-----------------|---------------------|
| | | Full membership | Crossover point | Full non-membership |
| Outcome variables | EP | 6.96 | 5 | 3.6 |
| Conditional variables | TO | 6.5 | 5 | 3.525 |
| | MO | 6.75 | 5.5 | 4.25 |
| | EO | 6.5 | 5 | 3.75 |
| | ECBMI | 6.5 | 5 | 3.5 |
| | NCBMI | 6.25 | 4.75 | 3.25 |

TABLE 7. Analysis of necessary conditions.

| Conditional variable | High-level EP | |
|----------------------|---------------|----------|
| | Consistency | Coverage |
| TO | 0.884442 | 0.818992 |
| ~TO | 0.554464 | 0.579879 |
| MO | 0.831188 | 0.830036 |
| ~MO | 0.560563 | 0.541765 |
| EO | 0.840438 | 0.865779 |
| ~EO | 0.561345 | 0.526909 |
| ECBMI | 0.865261 | 0.849213 |
| ~ECBMI | 0.565965 | 0.556402 |
| NCBMI | 0.843437 | 0.876062 |
| ~NCBMI | 0.607293 | 0.565806 |

the result. Consistency is an important test standard for the necessary conditions. When the consistency score is greater than 0.90, this condition is necessary for the result [79]. The above calibrated fuzzy value is input into the fsQCA software for necessary condition analysis, and the results are summarized in Table 7.

3) ANALYSIS OF SUFFICIENT CONDITIONS

The sufficiency analysis of conditional configuration explores whether the set represented by the configuration composed of multiple conditions is a subset of the result set from the perspective of set theory. When using fsQCA 3.0 software for configuration analysis, the relevant parameters should be set according to the research needs. In this study, the original consistency threshold was set to 0.80, PRI consistency threshold was set to 0.75, and the case frequency threshold is set to 1. In software fsQCA Ver.3.0, three solutions were generated using the standard analysis program: complex solution, intermediate solution, and reduced solution. The core conditions of each solution can be identified by comparing the nested relationship between the intermediate and reduced solutions.

We use the QCA results proposed by Ragin to analyze the configuration of enterprise performance. The results are listed in Table 8, in which each column represents a possible conditional configuration. The results show that these three paths lead to a high-level of enterprise performance. Solution 1: technology orientation, market orientation, and novelty-centered business model innovation, the consistency is 0.990498, and the coverage is 0.667071 This result proves the impact of technology orientation, market orientation, and novelty-centered business model innovation (H1b, H1a, H2b, H3b and H6) on enterprise performance. Solution 2: technology orientation, market orientation, and efficiency-centered business model innovation. The consistency was 0.992461 and the coverage was

TABLE 8. Sufficiency analysis of conditional configuration (enterprise performance).

| Conditional configuration | Path | | |
|---------------------------|-----------------|-----------------|-----------------|
| | Configuration 1 | Configuration 2 | Configuration 3 |
| TO | ● | ● | |
| MO | ● | ● | |
| EO | | | ● |
| ECBMI | | ● | ● |
| NCBMI | ● | | ● |
| Raw coverage | 0.667071 | 0.646536 | 0.662842 |
| Unique coverage | 0.0719112 | 0.0513757 | 0.122963 |
| Consistency | 0.990498 | 0.992461 | 0.972138 |
| Solution coverage | 0.84141 | | |
| Solution consistency | 0.968278 | | |

0.646536. This result further proves the impact of efficiency-centered business model innovation (H2a, H3a, H5) on enterprise performance. Solution 3: entrepreneurial orientation, novelty-centered business model innovation, and efficiency-centered business model innovation. The consistency was 0.972138 and coverage was 0.662842. This result is consistent with the PLS-SEM results and supports H4a, H4b H5, H6 and H1c.

4) ROBUSTNESS TEST

We used standard methods to conduct a robust analysis of QCA results. The commonly used methods are: Adjust the calibration threshold, change the consistency threshold, add or delete the shell, change the frequency threshold, and add other conditions. Method 1: Referring to the practice of Fiss, the robustness test is carried out by adjusting the crossing point of calibration. Specifically, the crossing point is adjusted from 0.5 to 0.55. The number of configurations and the neutral permutations with the same core conditions but different edge conditions all changed slightly, but the changes were not enough to support meaningful and completely different substantive interpretation method 2. Referring to the set relation and quasi-sum difference of configurations proposed by Schneider and Wagemann [80] as the judging criteria, this paper reduced the consistency threshold from 0.8 to 0.75 and found that the research configurations were still supported. Therefore, the research conclusions of this paper are still robust.

V. CONCLUSION AND DISCUSSION

This paper focuses on the basic research proposition of “how to promote corporate performance through strategic orientation choices”. Through an empirical study of the theoretical framework of “strategic orientation - business model innovation - firm performance”, the intrinsic relationship between strategic orientation, business model innovation, and firm performance is clarified. The study answers the question of how to choose strategic orientation in order to achieve the performance improvement goal, taking into account the factors of the company’s own endowment and the current situation, and further elaborates how to expand the value capture effect of different types of business model innovation by

enhancing the quality of strategic orientation implementation with different focus tendencies. The following three main findings emerge.

First, market orientation, technology orientation, and entrepreneurial orientation all have positive effects on firm performance improvement. Market orientation emphasizes the use of market information for business activities, which can enhance its market acumen and ability to maintain customer relationships, and to a certain extent, contribute to the improvement of firm performance. Technology orientation focuses on product development with advanced technology to expand competitive advantage and achieve superior performance. Entrepreneurial orientation advocates that companies need to learn a wide range of knowledge and skills, build core competencies by staying ahead of competitors, improve the efficiency of innovative products or processes in the market, and achieve higher levels of performance. Different strategic orientations lead to different choices of competitive strategies and resource allocation and use, but regardless of the dimension of strategic orientation, they all aim to expand market share by enhancing their competitive advantages, and therefore contribute to a certain extent to the improvement of corporate performance.

Second, the three dimensions of strategic orientation have different effects on each dimension of business model innovation, as follows: (1) Market orientation significantly and positively affects efficiency-based business model innovation, while it does not significantly affect novel business model innovation. Market orientation is a responsive organizational culture that motivates companies to deploy their strategic attention, and market-oriented values motivate companies to focus more on maintaining and preserving existing markets rather than focusing on developing new markets. Specifically, market-oriented enterprises are more capable of identifying, understanding and anticipating market needs, and are able to enhance their level of response to the industrial environment by strengthening continuous resource investment, such as accumulating market knowledge and promoting the cross-sectoral application of key knowledge, so that market-oriented logic helps enterprises design efficiency-oriented business models that focus on improving efficiency and reducing costs. In contrast to efficiency-based business model innovation, novel business model innovation focuses on value creation and capture in a new market, and advocates that companies should improve and innovate key elements of their original business models based on this goal. As a result, market-oriented companies focus more on understanding and responding to the existing industrial environment, and therefore tend to develop efficiency-based business model innovation rather than novel business model innovation in the process of strategic focus and resource optimization.

(2) Technology orientation has a significant impact on the innovation level of both efficiency and novelty business models, and it has a greater impact on novelty business model innovation. On the one hand, technology orientation motivates enterprises to continuously and cumulatively invest

capital in developing and designing new products or services, actively build a technology platform of industrial ecosystem, and form a powerful technology radiation with this platform as the core, which in turn improves transaction efficiency by controlling the transaction costs of all participants in the technology platform of the system, and promotes efficiency-oriented business model innovation of enterprises. On the other hand, technology orientation stimulates enterprises to use the productization and commercialization features of emerging technologies to form revolutionary products and promote new product development and management to reach a more efficient level, and at the same time, it can promote novel business model innovation through such channels as linking new transaction objects, building new value propositions and establishing new transaction models.

(3) Entrepreneurial orientation has a significant impact on the innovation level of both efficient and novel business models, and the impact on novel business model innovation is greater. On the one hand, entrepreneurially oriented firms tend to accurately identify, judge, and use good ideas to seize the right entrepreneurial opportunities for growth, so that when the external environment is more volatile or the internal business structure changes, firms can adjust their business models accordingly, such as by accelerating the transaction process and quickly aggregating demand, to maintain competitiveness, and thus drive efficient business model innovation. On the other hand, entrepreneurial orientation enables companies to accurately anticipate market needs in a dynamic market environment and act ahead of competitors to win strategic initiatives. In this process, the business model is constantly changing and adjusting, i.e., adjusting its value proposition to new products or services, designing new transaction mechanisms, and aggressively targeting market segments, thus driving value creation and value capture balance and novel business model innovation.

Third, the impact of strategic orientation on firm performance can be realized through the mediating role of efficiency-based business model innovation and novel business model innovation. That is, different strategic orientations, such as market orientation, technology orientation, and entrepreneurial orientation, can affect firm performance directly, or they can further affect firm performance by influencing efficient and novel business model innovation. These two paths together constitute the mechanism of strategic orientation on firm performance. First, market orientation directly affects the change of firm performance, which indicates that market orientation can motivate firms to use the market information obtained to develop new products or services to satisfy customers' needs and thus contribute to the improvement of firm performance. In addition, companies should use the advantages of market orientation to obtain resources, always coordinate with changes in the market environment and the internal environment, and innovate business models by accelerating the transaction process or establishing new transaction models to provide the basis for establishing and maintaining a competitive advantage and

creating sustained performance excellence. Second, technology orientation directly affects changes in firm performance, which suggests that technology orientation can lead firms to bring customers products with newer designs and better functionality through technological advances, enhancing competitive advantage and further improving performance. In addition, enterprises should take advantage of the barriers brought by technology development to enterprises to continuously integrate and optimize the articulation mode of value activities and improve transaction efficiency by changing the value chain structure adopted by the original business model and reducing the transaction costs between enterprises and partners. Alternatively, new technologies can be used to re-establish linkages with existing partners and to acquire new partners in a wider range, thus adding value to the potential resources in existing markets and achieving the goal of improving corporate performance. Finally, entrepreneurial orientation directly affects changes in firm performance, which indicates that entrepreneurial orientation can guide firms to adopt a first-mover advantage to seize emerging opportunities, thereby being the first to introduce new products and services and gaining sustainable competitive advantage through the establishment of industry standards. In addition, companies should actively use good ideas and suitable entrepreneurial opportunities to pursue development, actively anticipate market demand and act ahead of competitors, and adjust the logical structure of business value by optimizing the transaction process, quickly aggregating demand, and designing new transaction mechanisms to achieve value creation, value capture, and performance improvement. It can be seen that in the process of strategic-oriented selection by enterprises, conducting business model innovation means that they can obtain innovation resources, which is conducive to better performance in future innovation practices.

A. THEORETICAL CONTRIBUTION

This paper investigates the mechanism of strategic orientation on business model innovation and explores the important role of business model innovation as a mediating variable in the mechanism of strategic orientation on firm performance, with theoretical contributions focusing on three aspects:

First, this paper explores the different processes by which three key strategic orientations, which are market orientation, technology orientation, and entrepreneurial orientation, affect changes in enterprise performance, and clarifies the mechanisms by which enterprises make strategic orientation choices to achieve superior performance based on factor endowments and current situational characteristics, which helps clarify the internal logic of strategic orientation on enterprise performance improvement. The findings of existing studies on the mechanism of strategic orientation on enterprise performance are divergent: some scholars point out that strategic orientation has a significant positive effect on improving organizational performance [33]; however, some studies point out that the effect of strategic orientation on enterprise performance may vary to a certain extent in some

specific contexts. In this paper, we focus on three strategic orientations (market orientation, technology orientation, and entrepreneurial orientation) that advocate openness to new ideas but differ in their tendency to focus on strategic directions, and investigate the effect of strategic orientation on the performance improvement process. The study points out that different strategic orientations lead to different choices of competitive strategies and resource allocation and use, which can fully explain the divergence of research on the mechanism of strategic orientation on enterprise performance and provide useful insights for enterprises to choose strategic orientations according to their factor endowments and current contextual characteristics in order to build competitive advantages.

Second, this paper explores the role of different strategic orientations on different types of business model innovation, contributing to the analysis of the intrinsic mechanism of how strategic orientations fit better with the business model innovation process to achieve value capture, expanding the theoretical boundary of the study of the mechanism of the role of strategic orientations on business model innovation. Previous studies have mostly focused on a specific orientation [81] or considered strategic orientation as a complete construct [60] and explored its relationship with the construct of business model innovation, ignoring the inner logic of why and how different strategic orientations achieve different choices for business model innovation. This paper clarifies the relationship between the role of three important strategic orientation dimensions - market orientation, technology orientation, and entrepreneurial orientation - on efficient and novel business model innovation, clarifies the differences in the influence between different strategic orientations and business model innovation, and provides a new theoretical perspective for understanding the innovation practices of enterprises with different strategic orientations that have a tendency to choose the type of business model innovation.

Third, this paper innovatively introduces business model innovation as a mediating variable to explore the effect of different types of business model innovation on the relationship between market orientation, technology orientation, entrepreneurial orientation and enterprise performance, which further improves and enhances the explanatory power of strategic orientation on enterprise performance changes and deepens the research on the mechanism of strategic orientation's effect on enterprise performance. Existing studies on the mechanism of the effect of strategic orientation on enterprise performance have either explored the direct role between the two [63] or mainly about mediating variables such as organizational learning, organizational (technological) innovation, and organizational capability resources [34], [82], [83]. The important role of business model innovation as a means of value capture in the process of strategic orientation for enterprise performance improvement has been overlooked. This paper analyzes the mediating effects of efficiency-centered and novelty-centered business model innovation, explaining the inner logic of different strategic orientations' different understandings of

their own advantages affecting the process of business model innovation of enterprises [68], which to a certain extent provides theoretical reference support for subsequent studies to deeply understand business model innovation as an intrinsic mechanistic element of value transformation, and contributes to the deepening of research on the role of strategic orientation in the process of performance change.

B. MANAGEMENT CONTRIBUTION

At the same time, the practical insights of the study mainly include three aspects: First, with the increasing characteristics of boundless, interactivity and uncertainty in the environment of enterprises in the digital era, the difficulty of strategic change decisions in the actual business process has gradually increased. This requires enterprises to pay attention to the characteristics of their market environment and resource endowment when choosing strategic orientations, and pay attention to the selection, cultivation and development of different strategic orientations to promote a high degree of matching between their own resource advantages and the external environment.

Second, in the process of promoting enterprise performance through strategic orientation, business model innovation shows great potential to create and capture value, accurately perceive the dynamic characteristics of the environment, and maintain sensitivity to new opportunities. Building core competitiveness through efficient-centered and novel-centered business model innovation, and realizing the update and optimization of resource development, research and development models, production methods, marketing systems, and circulation systems in the process of production and operation are the key paths to achieve excellent value acquisition.

Thirdly, in the process of choosing strategic orientation and carrying out business model innovation, enterprises should always pay attention to the difference of different strategic orientations for different types of business model innovation and obtain strategic initiative and better value in market competition by reasonably matching enterprise strategy and business model innovation behavior, so as to enhance competitive advantage to the greatest extent.

C. LIMITATIONS AND FUTURE RESEARCH

Although this study contributes to research in related fields, such as strategic orientation and business model innovation, it still has the following limitations.

First, we suggest that the following directions can be pursued: to consider and introduce external contextual factors as moderating variables, such as environmental turbulence, to investigate the role of external environmental dynamics on the process of strategic orientation and business model innovation in improving enterprise performance.

Second, the research data for this study came from China. The different external environments faced by China's enterprises and other countries may cause the characteristics of enterprise strategic orientations to differ. For example, market

orientation may show significant differences, which may affect research results.

Third, we further investigate the factors influencing enterprises' strategic orientation choices, analyze the circumstances under which enterprises develop different market, technological, and entrepreneurial orientations, and conduct research on the mechanisms of strategic orientation based on these factors.

REFERENCES

- [1] S. Nambisan, "Architecture vs. ecosystem perspectives: Reflections on digital innovation," *Inf. Org.*, vol. 28, no. 2, pp. 104–106, Jun. 2018, doi: [10.1016/j.infoandorg.2018.04.003](https://doi.org/10.1016/j.infoandorg.2018.04.003).
- [2] S. Nambisan, K. Lyytinen, A. Majchrzak, and M. Song, "Digital innovation management: Reinventing innovation management research in a digital world," *MIS Quart.*, vol. 41, no. 1, pp. 223–238, Jan. 2017, doi: [10.25300/MISQ/2017/41.1.03](https://doi.org/10.25300/MISQ/2017/41.1.03).
- [3] A. Goldfarb and C. Tucker, "Digital economics," *J. Econ. Literature*, vol. 57, no. 1, pp. 3–43, Mar. 2019, doi: [10.1257/jel.20171452](https://doi.org/10.1257/jel.20171452).
- [4] H. Bouwman, S. Nikou, and M. De Reuver, "Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs?" *Telecommun. Policy*, vol. 43, no. 9, Oct. 2019, Art. no. 101828, doi: [10.1016/j.telpol.2019.101828](https://doi.org/10.1016/j.telpol.2019.101828).
- [5] T. Clauss, M. Abebe, C. Tangpong, and M. Hock, "Strategic agility, business model innovation, and firm performance: An empirical investigation," *IEEE Trans. Eng. Manag.*, vol. 68, no. 3, pp. 767–784, Jun. 2021, doi: [10.1109/TEM.2019.2910381](https://doi.org/10.1109/TEM.2019.2910381).
- [6] D. J. Teece, "Profiting from innovation in the digital economy: Enabling technologies, standards, and licensing models in the wireless world," *Res. Policy*, vol. 47, no. 8, pp. 1367–1387, Oct. 2018, doi: [10.1016/j.respol.2017.01.015](https://doi.org/10.1016/j.respol.2017.01.015).
- [7] R. Vecchiato, "Environmental uncertainty, foresight and strategic decision making: An integrated study," *Technol. Forecasting Social Change*, vol. 79, no. 3, pp. 436–447, Mar. 2012, doi: [10.1016/j.techfore.2011.07.010](https://doi.org/10.1016/j.techfore.2011.07.010).
- [8] W. Zhou, D. Su, J. Yang, D. Tao, and D. Sohn, "When do strategic orientations matter to innovation performance of green-tech ventures? The moderating effects of network positions," *J. Cleaner Prod.*, vol. 279, Jan. 2021, Art. no. 123743, doi: [10.1016/j.jclepro.2020.123743](https://doi.org/10.1016/j.jclepro.2020.123743).
- [9] B. Kindermann, S. Beutel, G. G. De Lomana, S. Strese, D. Bendig, and M. Brettel, "Digital orientation: Conceptualization and operationalization of a new strategic orientation," *Eur. Manage. J.*, vol. 39, no. 5, pp. 645–657, Oct. 2021, doi: [10.1016/j.emj.2020.10.009](https://doi.org/10.1016/j.emj.2020.10.009).
- [10] G. B. Voss and Z. G. Voss, "Strategic orientation and firm performance in an artistic environment," *J. Marketing*, vol. 64, no. 1, pp. 67–83, Jan. 2000, doi: [10.1509/jmkg.64.1.67.17993](https://doi.org/10.1509/jmkg.64.1.67.17993).
- [11] C. Markides and L. Sosa, "Pioneering and first mover advantages: The importance of business models," *Long Range Planning*, vol. 46, nos. 4–5, pp. 325–334, Aug. 2013, doi: [10.1016/j.lrp.2013.06.002](https://doi.org/10.1016/j.lrp.2013.06.002).
- [12] R. Amit and C. Zott, "Strategy in changing markets: New business models—Creating value through business model innovation," *MIT Sloan Manage. Rev.*, vol. 53, no. 3, pp. 41–49, 2012. Accessed: Jan. 4, 2022. [Online]. Available: <https://www.mendeley.com/catalogue/389cfd04-5a0d-3b4f-80cc-31c617179e2e/>
- [13] J. Wu, Z. Ma, and Z. Liu, "The moderated mediating effect of international diversification, technological capability, and market orientation on emerging market firms' new product performance," *J. Bus. Res.*, vol. 99, pp. 524–533, Jun. 2019, doi: [10.1016/j.jbusres.2018.03.025](https://doi.org/10.1016/j.jbusres.2018.03.025).
- [14] N. Selmi and D. Chaney, "A measure of revenue management orientation and its mediating role in the relationship between market orientation and performance," *J. Bus. Res.*, vol. 89, pp. 99–109, Aug. 2018, doi: [10.1016/j.jbusres.2018.04.008](https://doi.org/10.1016/j.jbusres.2018.04.008).
- [15] C. H. Noble, R. K. Sinha, and A. Kumar, "Market orientation and alternative strategic orientations: A longitudinal assessment of performance implications," *J. Marketing*, vol. 66, no. 4, pp. 25–39, Oct. 2002, doi: [10.1509/jmkg.66.4.25.18513](https://doi.org/10.1509/jmkg.66.4.25.18513).
- [16] R. E. Morgan and C. A. Strong, "Market orientation and dimensions of strategic orientation," *Eur. J. Marketing*, vol. 32, nos. 11–12, pp. 1051–1073, Dec. 1998, doi: [10.1108/03090569810243712](https://doi.org/10.1108/03090569810243712).

- [17] K. Z. Zhou and C. B. Li, "How strategic orientations influence the building of dynamic capability in emerging economies," *J. Bus. Res.*, vol. 63, no. 3, pp. 224–231, Mar. 2010, doi: [10.1016/j.jbusres.2009.03.003](https://doi.org/10.1016/j.jbusres.2009.03.003).
- [18] Y. Eshima and B. S. Anderson, "Firm growth, adaptive capability, and entrepreneurial orientation," *Strategic Manage. J.*, vol. 38, no. 3, pp. 770–779, Mar. 2017, doi: [10.1002/smj.2532](https://doi.org/10.1002/smj.2532).
- [19] K. Z. Zhou, G. Y. Gao, Z. Yang, and N. Zhou, "Developing strategic orientation in China: Antecedents and consequences of market and innovation orientations," *J. Bus. Res.*, vol. 58, no. 8, pp. 1049–1058, Aug. 2005, doi: [10.1016/j.jbusres.2004.02.003](https://doi.org/10.1016/j.jbusres.2004.02.003).
- [20] W. E. Baker, D. Mukherjee, and M. G. Perin, "Learning orientation and competitive advantage: A critical synthesis and future directions," *J. Bus. Res.*, vol. 144, pp. 863–873, May 2022, doi: [10.1016/j.jbusres.2022.02.003](https://doi.org/10.1016/j.jbusres.2022.02.003).
- [21] J. Spanjol, W. J. Qualls, and J. A. Rosa, "How many and what kind? The role of strategic orientation in new product ideation: Strategic orientation's role in new product ideation," *J. Product Innov. Manage.*, vol. 28, no. 2, pp. 236–250, Mar. 2011, doi: [10.1111/j.1540-5885.2010.00794.x](https://doi.org/10.1111/j.1540-5885.2010.00794.x).
- [22] N. Kim, S. Im, and S. F. Slater, "Impact of knowledge type and strategic orientation on new product creativity and advantage in high-technology firms: Impact of knowledge type and strategic orientation," *J. Product Innov. Manage.*, vol. 30, no. 1, pp. 136–153, Jan. 2013, doi: [10.1111/j.1540-5885.2012.00992.x](https://doi.org/10.1111/j.1540-5885.2012.00992.x).
- [23] F. Caputo, V. Cillo, E. Candelò, and Y. Liu, "Innovating through digital revolution: The role of soft skills and big data in increasing firm performance," *Manage. Decis.*, vol. 57, no. 8, pp. 2032–2051, Sep. 2019, doi: [10.1108/MD-07-2018-0833](https://doi.org/10.1108/MD-07-2018-0833).
- [24] D. Rogers, *The Digital Transformation Playbook: Rethink Your Business for the Digital Age*. New York, NY, USA: Columbia Univ. Press, 2016, doi: [10.7312/roge17544](https://doi.org/10.7312/roge17544).
- [25] B. K. Chae, "A general framework for studying the evolution of the digital innovation ecosystem: The case of big data," *Int. J. Inf. Manage.*, vol. 45, pp. 83–94, Apr. 2019, doi: [10.1016/j.ijinfomgt.2018.10.023](https://doi.org/10.1016/j.ijinfomgt.2018.10.023).
- [26] C. F. Rocha, D. F. Mamédio, and C. O. Quandt, "Startups and the innovation ecosystem in industry 4.0," *Technol. Anal. Strategic Manage.*, vol. 31, no. 12, pp. 1474–1487, Dec. 2019, doi: [10.1080/09537325.2019.1628938](https://doi.org/10.1080/09537325.2019.1628938).
- [27] G. Nakos, P. Dimitratos, and S. Elbanna, "The mediating role of alliances in the international market orientation-performance relationship of SMEs," *Int. Bus. Rev.*, vol. 28, no. 3, pp. 603–612, Jun. 2019, doi: [10.1016/j.ibusrev.2018.12.005](https://doi.org/10.1016/j.ibusrev.2018.12.005).
- [28] C. Lomberg, D. Urbig, C. Stöckmann, L. D. Marino, and P. H. Dickson, "Entrepreneurial orientation: The dimensions' shared effects in explaining firm performance," *Entrepreneurship Theory Pract.*, vol. 41, no. 6, pp. 973–998, Nov. 2017, doi: [10.1111/etap.12237](https://doi.org/10.1111/etap.12237).
- [29] K. Z. Zhou, C. K. B. Yim, and D. K. Tse, "The effects of strategic orientations on technology- and market-based breakthrough innovations," *J. Marketing*, vol. 69, no. 2, pp. 42–60, Apr. 2005, doi: [10.1509/jmkg.69.2.42.60756](https://doi.org/10.1509/jmkg.69.2.42.60756).
- [30] K. Atuahene-Gima and A. Ko, "An empirical investigation of the effect of market orientation and entrepreneurship orientation alignment on product innovation," *Org. Sci.*, vol. 12, no. 1, pp. 54–74, Feb. 2001, doi: [10.1287/orsc.12.1.54.10121](https://doi.org/10.1287/orsc.12.1.54.10121).
- [31] S. F. Slater, E. M. Olson, and G. T. M. Hult, "The moderating influence of strategic orientation on the strategy formation capability-performance relationship," *Strategic Manage. J.*, vol. 27, no. 12, pp. 1221–1231, Dec. 2006, doi: [10.1002/smj.569](https://doi.org/10.1002/smj.569).
- [32] S. R. Didonet, A. Fearné, and G. Simmons, "Determining the presence of a long-term/short-term dilemma for SMEs when adopting strategic orientation to improve performance," *Int. Small Bus. J.*, vol. 38, no. 2, pp. 90–110, Mar. 2020, doi: [10.1177/0266242619879369](https://doi.org/10.1177/0266242619879369).
- [33] R. E. Morgan, C. A. Strong, and T. McGuinness, "Product-market positioning and prospector strategy: An analysis of strategic patterns from the resource-based perspective," *Eur. J. Marketing*, vol. 37, no. 10, pp. 1409–1439, Nov. 2003, doi: [10.1108/03090560310487176](https://doi.org/10.1108/03090560310487176).
- [34] S. F. Slater and J. C. Narver, "Market orientation and the learning organization," *J. Marketing*, vol. 59, no. 3, pp. 63–74, Jul. 1995, doi: [10.1177/002224299505900306](https://doi.org/10.1177/002224299505900306).
- [35] L. Cacciolatti and S. H. Lee, "Revisiting the relationship between marketing capabilities and firm performance: The moderating role of market orientation, marketing strategy and organisational power," *J. Bus. Res.*, vol. 69, no. 12, pp. 5597–5610, Dec. 2016, doi: [10.1016/j.jbusres.2016.03.067](https://doi.org/10.1016/j.jbusres.2016.03.067).
- [36] M. J. R. Ortega, "Competitive strategies and firm performance: Technological capabilities' moderating roles," *J. Bus. Res.*, vol. 63, no. 12, pp. 1273–1281, Dec. 2010, doi: [10.1016/j.jbusres.2009.09.007](https://doi.org/10.1016/j.jbusres.2009.09.007).
- [37] M. Cucculelli and C. Bettinelli, "Business models, intangibles and firm performance: Evidence on corporate entrepreneurship from Italian manufacturing SMEs," *Small Bus. Econ.*, vol. 45, no. 2, pp. 329–350, Aug. 2015, doi: [10.1007/s11187-015-9631-7](https://doi.org/10.1007/s11187-015-9631-7).
- [38] C. Velu, "A systems perspective on business model evolution: The case of an agricultural information service provider in India," *Long Range Planning*, vol. 50, no. 5, pp. 603–620, Dec. 2016, doi: [10.17863/CAM.7244](https://doi.org/10.17863/CAM.7244).
- [39] J. Aspara, J. Hietanen, and H. Tikkanen, "Business model innovation vs replication: Financial performance implications of strategic emphases," *J. Strategic Marketing*, vol. 18, no. 1, pp. 39–56, Feb. 2010, doi: [10.1080/09652540903511290](https://doi.org/10.1080/09652540903511290).
- [40] S. R. Habtay, "A firm-level analysis on the relative difference between technology-driven and market-driven disruptive business model innovations," *Creativity Innov. Manage.*, vol. 21, no. 3, pp. 290–303, Sep. 2012, doi: [10.1111/j.1467-8691.2012.00628.x](https://doi.org/10.1111/j.1467-8691.2012.00628.x).
- [41] D. J. Teece, "The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms," *Acad. Manage. Perspect.*, vol. 28, no. 4, pp. 328–352, Nov. 2014, doi: [10.5465/amp.2013.0116](https://doi.org/10.5465/amp.2013.0116).
- [42] N. Eftekhari and M. Bogers, "Open for entrepreneurship: How open innovation can foster new venture creation," *Creativity Innov. Manage.*, vol. 24, no. 4, pp. 574–584, Dec. 2015, doi: [10.1111/caim.12136](https://doi.org/10.1111/caim.12136).
- [43] Y. Sun, J. Liu, and Y. Ding, "Analysis of the relationship between open innovation, knowledge management capability and dual innovation," *Technol. Anal. Strategic Manage.*, vol. 32, no. 1, pp. 15–28, Jan. 2020, doi: [10.1080/09537325.2019.1632431](https://doi.org/10.1080/09537325.2019.1632431).
- [44] S. P. Klein, P. Spieth, and S. Heidenreich, "Facilitating business model innovation: The influence of sustainability and the mediating role of strategic orientations," *J. Product Innov. Manage.*, vol. 38, no. 2, pp. 271–288, Mar. 2021, doi: [10.1111/jpim.12563](https://doi.org/10.1111/jpim.12563).
- [45] P. Gözler and A. Fritzsche, "Data-driven operations management: Organisational implications of the digital transformation in industrial practice," *Prod. Planning Control*, vol. 28, no. 16, pp. 1332–1343, Dec. 2017, doi: [10.1080/09537287.2017.1375148](https://doi.org/10.1080/09537287.2017.1375148).
- [46] S. Yin, N. Zhang, K. Ullah, and S. Gao, "Enhancing digital innovation for the sustainable transformation of manufacturing industry: A pressure-state-response system framework to perceptions of digital green innovation and its performance for green and intelligent manufacturing," *Systems*, vol. 10, no. 3, p. 72, May 2022, doi: [10.3390/systems10030072](https://doi.org/10.3390/systems10030072).
- [47] M. Matarazzo, L. Penco, G. Profumo, and R. Quaglia, "Digital transformation and customer value creation in made in Italy SMEs: A dynamic capabilities perspective," *J. Bus. Res.*, vol. 123, pp. 642–656, Feb. 2021, doi: [10.1016/j.jbusres.2020.10.033](https://doi.org/10.1016/j.jbusres.2020.10.033).
- [48] P. Aversa, S. Haefliger, and D. Reza, "Building a winning business model portfolio," *MIT Sloan Manage. Rev.*, vol. 58, pp. 49–54, Jun. 2017.
- [49] V. Jafari Sadeghi and P. P. Biancone, "How micro, small and medium-sized enterprises are driven outward the superior international trade performance? A multidimensional study on Italian food sector," *Res. Int. Bus. Finance*, vol. 45, pp. 597–606, Oct. 2018, doi: [10.1016/j.ribaf.2017.07.136](https://doi.org/10.1016/j.ribaf.2017.07.136).
- [50] R. G. Eccles, I. Ioannou, and G. Serafeim, "The impact of corporate sustainability on organizational processes and performance," *Manage. Sci.*, vol. 60, pp. 2835–2857, Nov. 2014, doi: [10.1287/mnsc.2014.1984](https://doi.org/10.1287/mnsc.2014.1984).
- [51] A. W. Joshi, "When does customer orientation hinder (help) radical product innovation? The role of organizational rewards: Customer orientation, radical product innovation," *J. Product Innov. Manage.*, vol. 33, no. 4, pp. 435–454, Jul. 2016, doi: [10.1111/jpim.12301](https://doi.org/10.1111/jpim.12301).
- [52] C. E. Helfat and M. A. Peteraf, "Managerial cognitive capabilities and the microfoundations of dynamic capabilities," *Strategic Manage. J.*, vol. 36, no. 6, pp. 831–850, Jun. 2015, doi: [10.1002/smj.2247](https://doi.org/10.1002/smj.2247).
- [53] S. F. Slater, J. J. Mohr, and S. Sengupta, "Radical product innovation capability: Literature review, synthesis, and illustrative research propositions: Radical product innovation capability," *J. Product Innov. Manage.*, vol. 31, no. 3, pp. 552–566, May 2014, doi: [10.1111/jpim.12113](https://doi.org/10.1111/jpim.12113).
- [54] M. Gerstein and H. Reisman, "Creating competitive advantage with computer technology," *J. Bus. Strategy*, vol. 3, no. 1, pp. 53–60, Feb. 1982, doi: [10.1108/eb038956](https://doi.org/10.1108/eb038956).
- [55] Y. Liu, L. Tao, Y. Li, and A. I. El-Ansary, "The impact of a distributor's trust in a supplier and use of control mechanisms on relational value creation in marketing channels," *J. Bus. Ind. Marketing*, vol. 23, no. 1, pp. 12–22, Jan. 2008, doi: [10.1108/08858620810841452](https://doi.org/10.1108/08858620810841452).

- [56] H. Gatignon and J.-M. Xuereb, "Strategic orientation of the firm and new product performance," *J. Marketing Res.*, vol. 34, no. 1, pp. 77–90, Feb. 1997, doi: [10.1177/002224379703400107](https://doi.org/10.1177/002224379703400107).
- [57] P. Hortinha, C. Lages, and L. F. Lages, "The trade-off between customer and technology orientations: Impact on innovation capabilities and export performance," *J. Int. Marketing*, vol. 19, no. 3, pp. 36–58, Sep. 2011, doi: [10.1509/jimk.19.3.36](https://doi.org/10.1509/jimk.19.3.36).
- [58] Y. Ma, Q. Yin, Y. Pan, W. Cui, B. Xin, and Z. Rao, "Green product innovation and firm performance: Assessing the moderating effect of novelty-centered and efficiency-centered business model design," *Sustainability*, vol. 10, no. 6, p. 1843, Jun. 2018, doi: [10.3390/su10061843](https://doi.org/10.3390/su10061843).
- [59] I. R. Baxendale, R. D. Braatz, B. K. Hodnett, K. F. Jensen, M. D. Johnson, P. Sharratt, J.-P. Sherlock, and A. J. Florence, "Achieving continuous manufacturing: Technologies and approaches for synthesis, workup, and isolation of drug substance May 20–21, 2014 continuous manufacturing symposium," *J. Pharmaceutical Sci.*, vol. 104, no. 3, pp. 781–791, Mar. 2015, doi: [10.1002/jps.24252](https://doi.org/10.1002/jps.24252).
- [60] Z. Su, "Institutional environment for entrepreneurship, strategic flexibility, and entrepreneurial orientation," *IEEE Trans. Eng. Manage.*, vol. 69, no. 4, pp. 1–11, Aug. 2020, doi: [10.1109/TEM.2020.2969479](https://doi.org/10.1109/TEM.2020.2969479).
- [61] A. Asemokha, J. Musona, L. Torkkeli, and S. Saarenketo, "Business model innovation and entrepreneurial orientation relationships in SMEs: Implications for international performance," *J. Int. Entrepreneurship*, vol. 17, no. 3, pp. 425–453, Sep. 2019, doi: [10.1007/s10843-019-00254-3](https://doi.org/10.1007/s10843-019-00254-3).
- [62] M. Song, Y. L. Zhao, and C. A. Di Benedetto, "Do perceived pioneering advantages lead to first-mover decisions?" *J. Bus. Res.*, vol. 66, no. 8, pp. 1143–1152, Aug. 2013, doi: [10.1016/j.jbusres.2012.03.010](https://doi.org/10.1016/j.jbusres.2012.03.010).
- [63] W. Coreynen, J. Vanderstraeten, A. van Witteloostuijn, N. Cannaeerts, E. Loots, and H. Slabbinck, "What drives product-service integration? An abductive study of decision-makers' motives and value strategies," *J. Bus. Res.*, vol. 117, pp. 189–200, Sep. 2020, doi: [10.1016/j.jbusres.2020.05.058](https://doi.org/10.1016/j.jbusres.2020.05.058).
- [64] M. Jelinek and P. Bergey, "Innovation as the strategic driver of sustainability: Big data knowledge for profit and survival," *IEEE Eng. Manag. Rev.*, vol. 41, no. 2, pp. 14–22, 2nd Quart., 2013, doi: [10.1109/EMR.2013.2259978](https://doi.org/10.1109/EMR.2013.2259978).
- [65] Z. Yang, Z. Likai, and L. Ruoyu, "The impact of network ties on SMEs' business model innovation and enterprise growth: Evidence from China," *IEEE Access*, vol. 10, pp. 29846–29858, 2022, doi: [10.1109/ACCESS.2022.3158749](https://doi.org/10.1109/ACCESS.2022.3158749).
- [66] S. S. Yrjola, P. Ahokangas, and M. Matinmikko-Blue, "Value creation and capture from technology innovation in the 6G era," *IEEE Access*, vol. 10, pp. 16299–16319, 2022, doi: [10.1109/ACCESS.2022.3149590](https://doi.org/10.1109/ACCESS.2022.3149590).
- [67] G. Leon, A. Tejero, J. N. Franco-Riquelme, J. J. Kline, and R. E. Campos-Macha, "Proximity metrics for selecting R&D partners in international open innovation processes," *IEEE Access*, vol. 7, pp. 79737–79757, 2019, doi: [10.1109/ACCESS.2019.2923094](https://doi.org/10.1109/ACCESS.2019.2923094).
- [68] C. C. Markides and P. J. Williamson, "Related diversification, core competences and corporate performance," *Strategic Manage. J.*, vol. 15, no. S2, pp. 149–165, Jun. 2007, doi: [10.1002/smj.4250151010](https://doi.org/10.1002/smj.4250151010).
- [69] M. N. Cortimiglia, A. Ghezzi, and A. G. Frank, "Business model innovation and strategy making nexus: Evidence from a cross-industry mixed-methods study: Business model innovation and strategy making Nexus," *RD Manage.*, vol. 46, no. 3, pp. 414–432, Jun. 2016, doi: [10.1111/radm.12113](https://doi.org/10.1111/radm.12113).
- [70] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," *Eur. Bus. Rev.*, vol. 31, no. 1, pp. 2–24, Jan. 2019, doi: [10.1108/EBR-11-2018-0203](https://doi.org/10.1108/EBR-11-2018-0203).
- [71] P. C. Fiss, "Building better causal theories: A fuzzy set approach to typologies in organization research," *Acad. Manage. J.*, vol. 54, no. 2, pp. 393–420, Apr. 2011, doi: [10.5465/amj.2011.60263120](https://doi.org/10.5465/amj.2011.60263120).
- [72] C. Afonso, G. M. Silva, H. M. Gonçalves, and M. Duarte, "The role of motivations and involvement in wine tourists' intention to return: SEM and fsQCA findings," *J. Bus. Res.*, vol. 89, pp. 313–321, Aug. 2018, doi: [10.1016/j.jbusres.2017.11.042](https://doi.org/10.1016/j.jbusres.2017.11.042).
- [73] A. G. Woodside, "Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory," *J. Bus. Res.*, vol. 66, no. 4, pp. 463–472, Apr. 2013, doi: [10.1016/j.jbusres.2012.12.021](https://doi.org/10.1016/j.jbusres.2012.12.021).
- [74] B. Rihoux and C. Ragin, *Configurational Comparative Methods: Qualitative Comparative Analysis and Related Techniques*. Thousand Oaks, CA, USA: Sage, 2009, doi: [10.4135/9781452226569](https://doi.org/10.4135/9781452226569).
- [75] P. Mikalef and A. Pateli, "Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA," *J. Bus. Res.*, vol. 70, pp. 1–16, Jan. 2017, doi: [10.1016/j.jbusres.2016.09.004](https://doi.org/10.1016/j.jbusres.2016.09.004).
- [76] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *J. Marketing Res.*, vol. 18, no. 1, p. 39, Feb. 1981, doi: [10.2307/3151312](https://doi.org/10.2307/3151312).
- [77] J. F. Hair, M. Sarstedt, C. M. Ringle, and J. A. Mena, "An assessment of the use of partial least squares structural equation modeling in marketing research," *J. Acad. Marketing Sci.*, vol. 40, no. 3, pp. 414–433, May 2012, doi: [10.1007/s11747-011-0261-6](https://doi.org/10.1007/s11747-011-0261-6).
- [78] J. Henseler, T. K. Dijkstra, M. Sarstedt, C. M. Ringle, A. Diamantopoulos, D. W. Straub, D. J. Ketchen, J. F. Hair, G. T. M. Hult, and R. J. Calantone, "Common beliefs and reality about PLS: Comments on Rönkkö and Evermann (2013)," *Org. Res. Methods*, vol. 17, no. 2, pp. 182–209, Apr. 2014, doi: [10.1177/1094428114526928](https://doi.org/10.1177/1094428114526928).
- [79] C. C. Ragin, "Set relations in social research: Evaluating their consistency and coverage," *Political Anal.*, vol. 14, no. 3, pp. 291–310, 2006, doi: [10.1093/pan/mpj019](https://doi.org/10.1093/pan/mpj019).
- [80] C. Schneider and C. Wagemann, *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. 2012, doi: [10.1017/CBO9781139004244](https://doi.org/10.1017/CBO9781139004244).
- [81] C. B. Jarvis, S. B. MacKenzie, and P. M. Podsakoff, "A critical review of construct indicators and measurement model misspecification in marketing and consumer research," *J. Consum. Res.*, vol. 30, no. 2, pp. 199–218, Sep. 2003, doi: [10.1086/376806](https://doi.org/10.1086/376806).
- [82] L. Lekmat, C. Selvarajah, and C. Hewege, "Relationship between market orientation, entrepreneurial orientation, and firm performance in Thai SMEs: The mediating role of marketing capabilities," *Int. J. Bus. Econ.*, vol. 17, no. 3, pp. 213–237, 2018. Accessed: Apr. 15, 2022. [Online]. Available: https://econpapers.repec.org/article/ijbjournal/v_3a17_3ay_3a2018_3ai_3a3_3ap_3a213-237.htm
- [83] Z. Cao, B. Huo, Y. Li, and X. Zhao, "The impact of organizational culture on supply chain integration: A contingency and configuration approach," *Supply Chain Manage., Int. J.*, vol. 20, no. 1, pp. 24–41, Jan. 2015, doi: [10.1108/SCM-11-2013-0426](https://doi.org/10.1108/SCM-11-2013-0426).
- [84] J. C. Narver and S. F. Slater, "The effect of a market orientation on business profitability," *J. Marketing*, vol. 54, no. 4, pp. 20–35, Oct. 1990, doi: [10.1177/002224299005400403](https://doi.org/10.1177/002224299005400403).
- [85] J. Wiklund and D. Shepherd, "Entrepreneurial orientation and small business performance: A configurational approach," *J. Bus. Venturing*, vol. 20, no. 1, pp. 71–91, Jan. 2005, doi: [10.1016/j.jbusvent.2004.01.001](https://doi.org/10.1016/j.jbusvent.2004.01.001).
- [86] G. B. Murphy, J. W. Trailer, and R. C. Hill, "Measuring performance in entrepreneurship research," *J. Bus. Res.*, vol. 36, no. 1, pp. 15–23, May 1996, doi: [10.1016/0148-2963\(95\)00159-X](https://doi.org/10.1016/0148-2963(95)00159-X).
- [87] G. N. Chandler and S. H. Hanks, "Measuring the performance of emerging businesses: A validation study," *J. Bus. Venturing*, vol. 8, no. 5, pp. 391–408, Sep. 1993, doi: [10.1016/0883-9026\(93\)90021-V](https://doi.org/10.1016/0883-9026(93)90021-V).

•••