A Review of Chinese Literature on Ambidexterity Innovation and Its Future Prospects

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Abstract—On the basis of conceptual research on dual innovation by foreign scholars, through searching and reading the research literature on dual innovation published in domestic journals since 2020, it is found that domestic scholars have found that the status of resources, organizational environment, network structure, learning and knowledge from the perspective of technology, a lot of research has been done on the path mechanism, influencing factors and corporate performance of dual innovation. Therefore, by reviewing the research themes in recent years, firstly, it summarizes the current research status of dual innovation from the above aspects, secondly describes the current existing dual innovation research perspectives, and finally looks forward to future research.

Keywords—Ambidexterity innovation; Path and mechanism; Influencing factor; Corporate performance.

I. INTRODUCTION

Before the 1990s, reducing production costs was the main means for companies to increase profits. After the 1990s, with the increasing competition in the product market, on the one hand, companies wanted to maintain the existing product market, and on the other hand, to avoid products being eliminated by the market. Some companies began to explore innovation. In order to meet the needs of innovation practice, ambidexterity innovation theory has also been developed, from Solow Surplus to Schumpeter's theory of innovation, to Davis and North’s theory of institutional innovation, the theoretical circle began to think about innovation from exogenous variables to endogenous variables. In the process of combining innovation and corporate strategy, based on the assumption of resource constraints, scholars believe that there are two types of innovation, exploratory and mining innovation, but the two are opposite. Based on Ducan's ambidexterity organization theory, March (1991) first proposed the ambidexterity innovation theory and pointed out that the two can be balanced. Tushman and O'Reilly (1996) called these two types of innovations Ambidexterity in innovation.

During the "Twelfth Five-Year Plan" period, China focused on the development of technological innovation. During the "Thirteenth Five-Year Plan" period, China's economic development entered a new normal, and the development strategy changed from a strategy of rejuvenating the country through science and education to an innovation-driven strategy. According to the Science and Engineering Indicators 2020 issued by the National Science Foundation, China's R&D expenditure accounted for 23% of total global expenditure in 2017, and from 2003 years to 2018 years the global share of the value-added output of knowledge and technology-intensive industries rose from approximately 6% to 21%. In addition, the number of patents has ranked first in the world in recent years. However, in the ranking of comprehensive innovation capabilities, China's ranks around 20 in the world, with a contribution rate of 55% of scientific and technological progress, and a degree of dependence on foreign technology as high as 40%. Although China's scientific and technological innovation capabilities continue to improve, the independent innovation capabilities of China's companies are not strong, and the investment in applied innovation is insufficient. When Chinese companies are caught in the dilemma of independent innovation, the advantages of ambidexterity innovation have been highlighted. On the one hand, independent innovation has high risks, long R&D cycles, low commercialization rate of R&D products, and unstable profitability. On the other hand, enterprise development depends more on the introduction of technology from foreign countries, and key innovative technologies are controlled by others. For a long time, many Chinese companies have fallen into the innovation cycle of introduction-absorption-imitation-re-introduction, as shown in figure 1.

Because ambidexterity innovation has the characteristics of both progressive and breakthrough innovations, while using the company's existing knowledge and resources to carry out low-risk innovation activities, it can also explore new knowledge and resources for high-risk independent innovation activities. Ambidexterity innovation has the characteristics of both progressive and breakthrough innovation. While using the company's existing knowledge and resources to carry out low-risk innovation activities, it can also explore new knowledge and resources for high-risk independent innovation activities. It be seen that the ambidexterity innovation theory can help Chinese companies break out of the "introduction-absorption-imitation-re-introduction" innovation circle.

In order to enrich domestic research on ambidexterity innovation theory and meet the actual development needs of Chinese enterprises, Chinese scholars have conducted further research on ambidexterity innovation based on the existing research of foreign scholars.
II. DOCUMENT RETRIEVAL AND SUBJECT CLASSIFICATION

In the Chinese database of KNS, a literature search with "ambidexterity innovation" as a key word can retrieve 191 articles. Documents that have "ambidexterity innovation" but are not relevant to the subject are manually eliminated. In the end, we retain 177 documents related to the research topic. By sorting out the number of research articles and years in China, it is found that Chinese scholars' research on ambidexterity innovation began in 2010. From table 1 below, it can be found that the number of Chinese literature researches has generally shown an increasing trend, which shows that ambidexterity innovation is becoming an important research object for Chinese scholars.

By sorting out the research topics and content of the Chinese literature, the domestic dual innovation literature can be divided into three types of research based on the nature of the existing research topics. From the perspective of the research content, the specific research on ambidexterity innovation can be divided into eight Class content, as shown in table 2 below:

From table 3 below, it is not difficult to find the most research literature on ambidexterity innovation and corporate performance, which shows that Chinese scholars focus on applied research on ambidexterity innovation.

By combining the research themes and perspectives of ambidexterity innovation in recent years, this article will mainly review the current situation of Chinese literature research from the three aspects of ambidexterity innovation path and mechanism, influencing factors and performance effects. And then look forward to the future research of ambidexterity innovation.

III. RESEARCH ON THE MECHANISM AND PATH OF AMBIDEXTERITY INNOVATION

(1) Induction and driving mechanism

From the perspective of managers, Zhao Jie (2010) found a positive correlation between manager’s shareholding and tenure and the balance and complementarity of ambidexterity innovation, indicating that managers may have two extremes in ambidexterity innovation: On the one hand, managers may fall into the ‘applied innovation trap’ due to the lack of incentive mechanisms; on the other hand, because the promotion mechanism within the enterprise follows the principle of survival of the fittest, they may also cater to the major shareholders due to professional pressure and prospects. Interests, ignoring corporate capabilities and deliberately carrying out exploratory innovation.
Table 2: Research classification of ambidexterity innovation

- **Mechanism and path research**
  - a. Induction and driving mechanism
  - b. Dynamic selection mechanism
  - c. Implementation path
- **Influence factors research**
  - a. Resource factor
  - b. Organizational factors
  - c. Network relationship
- **Performance relationship research**
  - a. The function of resources
  - b. Network structure influence
  - c. The mediating role of learning, knowledge, and R&D

Table 3: Subject terms involved in domestic dual innovation research

Note: Because there are multiple subject terms in some single research documents, the total number is greater than the total number of documents (1027-177)
From the perspective of innovation capability, the knowledge network influences the innovation capability of the enterprise and then induces the innovation willingness of the enterprise. Taking regional cluster enterprises as the research object, starting from the four forces of perturbation, triggering, enabling and contextual power, Zhang Xiaofen et al. (2015) constructed a conceptual model of the induction mechanism, analyzed the knowledge absorption, translation, and diffusion behavior of knowledge gatekeepers, as well as strategic technological leapfrogging, network construction and rule-making behaviors, and found that knowledge power acts on the knowledge gatekeepers. The behavior can then induce the ambidexterity innovation behavior of regional cluster enterprises. From the perspective of management activities, Lin Jun & Liu Jiang (2016) turned the attention of balancing ambidexterity innovation driving mechanisms to innovation management activities, pointing out that ambidexterity elements of intellectual capital and the interaction between elements drive innovation and ambidexterity innovation.

(2) Dynamic selection mechanism

From the perspective of enterprise life cycle, Wang Yin et al. (2012) introduced the enterprise life cycle to the study of the dynamic mechanism of ambidexterity innovation, and found that in the introduction and growth periods, developmental innovation is negatively correlated with performance, while exploratory innovation is positively correlated with performance. In the mature and declining periods, developmental innovation is positively correlated with performance, while exploratory innovation is negatively correlated with performance, which makes the choice of ambidexterity innovation for companies in different life cycles different. From the perspective of organizational members, Zhang Xiaotang & A Lien (2015) empirically analyzed the ambidexterity innovation search mechanism under the multi-dimensional perspective and the ambidexterity level of employees, and constructed three types of ambidexterity innovation search strategies. From the perspective of micro-cognition mechanism, from the perspective of micro-cognition mechanism, Zhang Min & Zhang Yilin (2016) introduced the risk appetite of the first-generation and second-generation entrepreneurs into the implementation path of ambidexterity innovation, and found that risk appetite and innovation behavior are significantly positively correlated in a fierce competitive environment. From the perspective of resource allocation efficiency, Ma Lian Fu et al. (2019) extended the resource-based research path selected by the company’s innovation strategy based on actual investment in the expected optimal investment deviation, and examined the impact of corporate capital allocation on the choice of innovation path, and found that when capital allocation is excessive, Companies prefer to choose exploratory innovation.

(3) Implementation path

From the perspective of organizational antecedents, Ren Zheng (2017) believes that the ambidexterity innovation of structure, context, and leadership is the three ways to achieve ambidexterity innovation of the organization. The ambidexterity innovation of structure focuses on the overall structure of the enterprise, and the context unit focuses on the employees. Personal development and the company’s system management; Leadership Ambidexterity ity pays attention to the cognition of senior management and the characteristics of the senior management team, and found that GREE has promoted the company’s ambidexterity innovation by means of senior management leadership innovation and incentives for all employees, and established an independent innovation project System and ambidexterity innovative organizational system. From the perspective of innovation methods, because innovation has the characteristics of large investment, high risk, long return period and poor stability, when an enterprise lacks funds, low technology content or lacks scientific and technological talents, this company prefers university–industry cooperation of innovation. Lin Yun & Zhang Min (2017) took the Northwest Nonferrous Metals Research Institute as an example to analyze the ambidexterity innovation path, and found that the pilot-scale incubation is an effective way to transform exploratory innovation to utilization innovation. Enterprises can improve the efficiency of ambidexterity innovation by obtaining external resources and taking advantage of university–industry cooperation.

IV. INFLUENCING FACTORS OF AMBIDEXTERITY INNOVATION

(1) Resource factors

Ambidexterity is inseparable from innovative resources, and resources determine whether an enterprise can carry out innovative activities. Xi Lei et al. (2017) believe that resource patchwork solves the problem of resource scarcity, and resource patchwork improves the level of balance, complementarity, and coordination of ambidexterity innovation. Lin Yun et al. (2017) believe that social capital is a way for organizations to obtain resources, and found that accumulating social capital can alleviate resource dilemmas. From the perspective of corporate external resources, Bi Xiaofang et al. (2017) believe that government subsidies affect the direction of corporate technology strategy, and companies with government subsidies prefer to choose exploratory innovation, and high financial redundancy policies can also significantly promote exploratory innovation. Li Chuanxian & Huang Li (2019) believe that government subsidies solve the financial dilemma of technological innovation and promote ambidexterity innovation investment in new energy listed companies. Li Chuanxian & Peng Huijuan (2019) found that government subsidies promote exploratory innovation investment more significantly than they promote utilization innovation. In addition to using government subsidies, some scholars believe that optimizing resource allocation can help solve the problem of resource scarcity. Ma Wenyuan et al. (2020) believe that the reasonable scheduling of social resources in the brand community can alleviate the scarcity of resources, and found that the social capital and brand knowledge in the brand community encourage companies to carry out ambidexterity innovation activities.
(2) Organizational factors

From the perspective of leaders, Li Yi et al. (2014) found that benevolent leaders hinder exploratory innovation when companies adopt the defender strategy, and authoritative leaders hinder digging innovation when adopting an analyst strategy, but when adopting a forward-looking strategy moral leadership can promote excavation innovation. Different leaders have different effects on ambidexterity innovation when the company's strategy is different. From the perspective of inter-organizational trust, Yang Zhi et al. (2015) found that inter-firm trust can also promote ambidexterity innovation after meeting certain conditions, such as strong market orientation, sufficient redundant resources, or human capital. From the perspective of organizational inertia, Dang Xinghua et al. (2016) found that structural inertia in organizational inertia promotes incremental innovation, and moderate cognitive inertia promotes breakthrough innovation.

(3) Network factors

Chen Jianxun et al. (2016) used structural theory and believed that shaping and changing the social network structure of TMT, and using new network structure to promote the smooth development of organizational ambidexterity innovation, empirically found that due to the rigid network structure, TMT social network and collaborative innovation have Inverted U-shaped effect, but a CEO with high leadership flexibility can weaken the degree of negative influence in this effect. Liu Renhui & Zhang Yi (2019) found that the more Internet platforms make use of complementary assets, the more beneficial it is for companies to implement ambidexterity innovation. Li Guoqiang et al. (2019) found that corporate network capabilities and network location migration have a significant positive effect on corporate ambidexterity innovation.

V. THE RELATIONSHIP BETWEEN AMBIDEXTERITY INNOVATION AND CORPORATE PERFORMANCE

(1) The inner role of corporate resources

The internal mechanism of integrating resources is an effective means to successfully achieve corporate performance under the ambidexterity strategy. Some scholars believe that the internal mechanism of performance generation in exploratory and utilization innovation activities is not clear. From the perspective of resource support, Wu Liang et al. (2016) used structural equation models to test hypothetical models and found exploratory and utilization innovation positively affects the pooling of resources and then affects corporate performance. From the perspective of resource management research, Wu Liang et al. (2016) found that there is a significant positive correlation between resource composition and corporate performance, and resource composition plays a complete intermediary role in ambidexterity innovation and corporate performance. Based on the resource combination method, Zang Jinjuan (2018) constructed a resource combination method, ambidexterity innovation and organizational performance model. With 250 hospitals as the research object, he found that ambidexterity innovation can significantly improve the organization performance of the enterprise, and the organization scale positively regulates the relationship between the resource combination method and ambidexterity innovation. From the perspective of resource integration, based on resource-based theory, Zhang Zhengang et al. (2020) found that resource integration and ambidexterity innovation in innovation networks are beneficial to improving the innovation performance of manufacturing enterprises, and ambidexterity innovation plays a full intermediary role.

(2) The influence of network structure

Some scholars have studied the connection between the network and ambidexterity innovation and performance. Based on the model of multi-level network structure interaction effects, Cui Yuehui (2018) used 408 sample data to study and found that network strength and stability jointly regulate the relationship between ambidexterity innovation and corporate performance. Xu Luyun et al. (2018) used China's automobile data from 1985 to 2011 and found that the knowledge network density promoted enterprises to improve utilization innovation performance and inhibited exploratory innovation performance from the perspective of enterprise internal knowledge integration, while the diversity of knowledge base strengthened this inhibition.

(3) The mediating role of learning, knowledge, and R&D

Song Chunhua et al. (2017) incorporated ambidexterity innovation into the three sub-dimensions of relational learning and corporate performance, and found that ambidexterity innovation plays an intermediary role in the relationship between information sharing and specific relationship memory and corporate performance, but in the common understanding and corporate performance there is no mediation in the relationship. From the perspective of learning orientation, Song Chunhua et al. (2017) proceeded from the three sub-dimensions of learning orientation and found that ambidexterity innovation plays a completely intermediary role in the relationship between learning orientation and corporate performance. Based on the knowledge-based view, Beilixin (2018) based on the knowledge-based view and conducted an empirical study with sample data from 190 hospitals, and found that external knowledge is positively correlated with a relatively balanced ambidexterity element, and internal knowledge integration is positively correlated with an organizational ambidexterity element. Both balanced and combined ambidexterity innovation and hospital innovation performance have an inverted U-shaped relationship. Li Baizhou et al. (2019) found that R&D capital promotes ambidexterity innovation and corporate performance, and exploratory innovation plays an intermediary role between R&D capital and corporate performance. Among them, human capital in R&D capital plays a complete intermediary role, while physical capital Play a part of the intermediary role. Compared with exploratory innovation, utilization innovation plays a part of the intermediary role in the physical capital of R&D and corporate performance, but does not have an intermediary role in the human capital of R&D.
VI. PROSPECTS OF AMBIDEXTERITY INNOVATION

(1) Research on the path mechanism of ambidexterity innovation

Firstly, in the research on the path mechanism of ambidexterity innovation, scholars mostly use longitudinal research methods. Existing research methods are mostly questionnaire surveys, and longitudinal survey data is usually difficult to obtain. It is easier for scholars to collect cross-sectional data for research design, so longitudinal design has become a research difficulty. The ambidexterity innovation theory is developed based on the ambidexterity organization theory. There are endless researches on the executive team and organization level of ambidexterity innovation in the Chinese literature, but there is a lack of research on the ambidexterity level of employees. Secondly, compared with the R&D management activities of ambidexterity innovation, scholars pay more attention to the resource management capabilities of enterprises. Finally, the existing research on the path mechanism of ambidexterity innovation is not sufficient, and the research on the path and mechanism is a new perspective that has been explored by scholars based on insufficient existing research.

To sum up, in future research, scholars can pay more attention to the dynamic research of ambidexterity innovation, solve the difficulties in the current research methods of vertical design, enrich the research of ambidexterity innovation mechanism at the individual level, and attach importance to the ambidexterity of enterprises Innovative management activities.

(2) Research on the influencing factors of ambidexterity innovation

Among the factors affecting ambidexterity innovation, companies first consider the issue of resource scarcity in the process of ambidexterity innovation. To this end, many scholars have conducted a lot of research on how companies integrate their internal resources, how to carry out resource reorganization, and resource optimization. Some scholars also study government subsidies and policy support from the external resources of the company.

In the future, First of all, consider studying the ways of enterprise resource integration and reorganization from multiple angles, and do more research related to ambidexterity’s innovative resource approach, such as considering the reduction of the cost of acquiring innovative resources through enterprise clusters or strategic alliances from the perspective of the industrial chain. Secondly, from the perspective of product customer needs, consider how to carry out ambidexterity innovation in a more targeted manner, and how to improve the utilization rate of enterprise innovation resources, such as classifying the resources owned by the enterprise, optimizing the resource allocation of the enterprise, and combining industry conditions, Government policies, competitive advantages, or enterprise scale and other factors to study enterprise innovation methods. In addition, we can consider dividing knowledge into tacit knowledge and explicit knowledge to study whether the two kinds of knowledge have an impact on the two innovations, and how to affect the practice of ambidexterity innovation in enterprises.

(3) Research on ambidexterity innovation and corporate performance

Ambidexterity innovation plays a direct intermediary role in the study of corporate performance such as resource combination, relationship learning or learning orientation, and has an indirect impact on the research of corporate performance such as resource patching, resource combination, network strength and network stability. Regardless of whether the ambidexterity innovation has a direct or indirect impact on corporate performance, improving corporate performance is the goal of ambidexterity innovation path mechanism research and influencing factors research.

Since the purpose of innovative research and development of enterprises is to obtain commercial benefits, future research can consider how to transform the innovative achievements of enterprises into the productivity of enterprises and improve the conversion rate of innovative scientific and technological achievements of enterprises. In addition, in the research on the influencing factors of ambidexterity innovation and the research on corporate performance, it can be found that the two types of research topics are highly consistent with the internal and external environment of the company, industry and industry, government and policies, corporate resources, corporate capital, and internal management. Research on topics such as corporate governance, organizational climate, organizational ambidexterity, network structure, knowledge technology, and relationship learning are mostly related, but the two categories of specific research rarely mention market environment, industrial competition, innovation willingness, and personal level ambidexterity innovation content.

Therefore, in the future, it can be considered to further combine the research on the influencing factors of ambidexterity innovation and the relationship between corporate performance, and introduce the research on the pre-factor and path mechanism of ambidexterity innovation into the research on corporate performance, and in the research on ambidexterity innovation and corporate performance combining the macroeconomic development status, the external market environment or the characteristics of the senior management team, etc., to enrich the research perspective and content of innovation performance.

REFERENCES
