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Artificial Intelligence Impact of Corporate Innovation Driven by Research on Elements and Mechanisms of Action

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Abstract:
This paper focuses on the influence elements and mechanism of action of enterprise innovation driven by artificial intelligence,firstly,it set forth the development status of the artificial intelligence industry scale and the motivation analysis of the change of enterprise innovation mode,and points out that the core driving force of enterprise innovation is the "knowledge spillover" and "organisational learning".Then, we analyse the heterogeneity of AI technology due to its usage and industry characteristics,and sort out the actual application of AI and the driving path of AI on enterprise innovation in related literature,explore the current development status, motivation and application of AI in enterprises, including the impact of different application types, enterprise and industry characteristics, etc., and then study the specific mechanism of AI affecting enterprise innovation through knowledge spillover and organisational learning in-depth and put forward corresponding strategies at the government and enterprise levels. Then, we will study the specific mechanism of AI affecting enterprise innovation through knowledge spillover and organisational learning, and propose corresponding strategies from government and enterprise levels. The study shows that AI affects enterprise innovation performance by strengthening knowledge spillover and optimising organisational learning through the toughness conduction of the innovation chain, thus providing reference for the theory and practice of enterprise innovation in the era of digital economy.

Keywords:
artificial intelligence,enterprise innovation,knowledge spillover, organisational learning,innovation chain toughness

1. Introduction

With the rapid development of artificial intelligence, more and more industries are completing their transformation and upgrading with the help of artificial intelligence. From the industrial robot cluster operation in the manufacturing production line, to the 24/7 response of intelligent customer service system in the service industry, to the accurate warning of AI risk control model in the financial industry, AI has penetrated from the edge technology to the core productivity.

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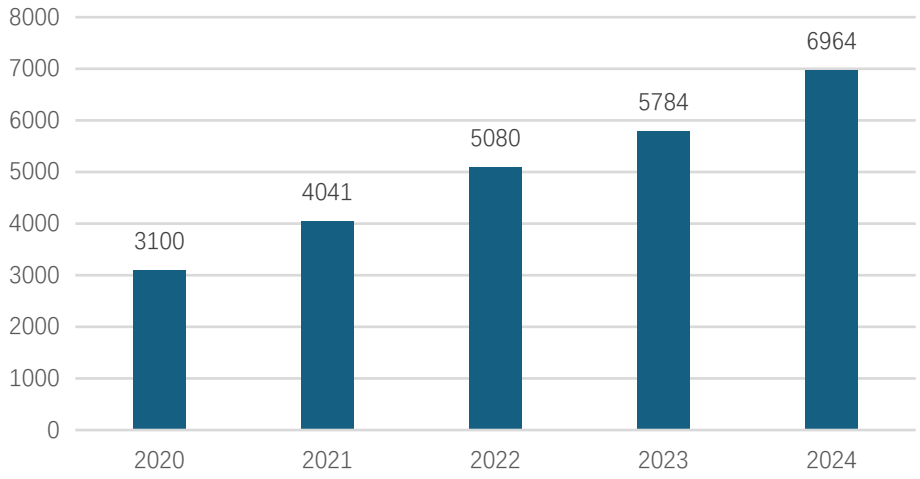

Figure 1 Scale of China's artificial intelligence industry, 2020-2024

Source: White Paper on the Development of China's Artificial Intelligence Industry, 2020-2024

As can be seen from Figure 1, the scale of the AI industry is growing in a rapid and powerful momentum in 2020-2024.From intelligent algorithms in R & D to accelerate patent analysis, to predictive maintenance in production to optimize supply chain efficiency, to customized services driven by user portraits at the business model level, the popularity of AI technology has not only changed the path of innovation, but also reshaped the way of knowledge interaction between enterprises and the external environment.(Xue, Ximeng et al., 2025)[10] .

In previous studies, many researchers have also suggested that AI technology often displays significant heterogeneity in the process of promoting enterprise innovation because of the way enterprises use it and the characteristics of the industry (Wang Fengzheng, Liu Ximeng, 2025)[16] - why some enterprises can achieve disruptive innovation breakthroughs through AI, while others are caught into the dilemma of "high cost and low efficiency" in their technology investment? Behind this difference, it is not only related to the type of AI technology itself[3] , but also closely related to the internal factors such as enterprises' own absorptive capacity and digital foundation, and also profoundly affected by external factors such as industry characteristics and policy environment.

This paper focuses on the specific impact mechanism of the use of AI on enterprise innovation in the current context of artificial intelligence, and through the specific analysis of the impact mechanism, systematically analyzes how AI technology affects the enterprise innovation performance by strengthening the knowledge spillover effect, optimizing the organisational learning process (Zhang Zhu et al., 2025)[14] , and by the conduction effect of the toughness of the innovation chain. By clarifying the interactive logic of the three, it can not only enrich the theory of enterprise innovation in the era of digital economy, but also provide practical guidance for enterprises to enhance their innovation effectiveness in the wave of AI.

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2. Literature Review

Schumpeter's innovation theory points out that scientific research and the technological inventions arising from it are the main driving force of innovation. Digital technology, a new type of technology with the characteristics of non-competitiveness, low entry threshold, self-growth, borderlessness and universality, is an important driving force for China to crack the innovation problem and empower innovation and high-quality development (Yu Qian, Zhan Xinyu, 2025)[36] . Artificial intelligence, as a cutting-edge technology, is reshaping the brand-new pattern of enterprise innovation with powerful influence (Zhang Zhu et al., 2025)[14] , and its influence mechanism presents multi-dimensional and deep-level characteristics (Su Taoyong et al., 2025)[15] .

2.1 Literature Research on Artificial Intelligence

As the core carrier of automation technology, industrial robots have been empirically verified for their role and path in promoting enterprise innovation. Compared with the automation attributes of industrial robots, the role of AI technology on enterprise innovation is more focused on the knowledge reconstruction of the enterprise and the efficiency improvement in departmental collaboration.

Table 1 Main ways in which AI affects enterprises

Author	Year	Main content	Impact on enterprises
Dong Zhiqing et al.	2023	With the help of existing intelligent algorithms and machine learning models, AI continuously updates existing traditional models and derives new production models[31] .	The wide application of AI achieves a high degree of integration of automation and intelligence in the production process, thus facilitating the increase of enterprise output.
Huang Bo, Li Haitong, Liu Junqi, et al.	2023	The synergistic nature of artificial intelligence strengthens the level of coordination between different elements of the enterprise, alleviates the friction costs caused by elemental mismatch, and improves the input-output efficiency of elements[32] .	Artificial intelligence, relying on data-driven decision-making systems, can further optimise the factor allocation structure of enterprises and help to achieve real-time feedback on key enterprise activities[32] .
Dan Shi, Guanglin Sun	2024	The application of Artificial Intelligence has led to a great release of the sharing potential of auxiliary production resources and infrastructure[13] .	Advances in AI technology provide a common technological basis for industry integration between different enterprises[13] , enhance the universality of production factors[16] , and promote the leanness of production processes, thus improving the overall quality of production and the efficiency of enterprise operations.

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Yao Jiaquan, Zhang Kunpeng, Guo Lipeng et al.	2024	Artificial Intelligence strengthens the level of production specialisation and intelligence, enabling enterprises to reduce the cost of training simple labour[32] .	Artificial intelligence gives machines intelligent attributes that can replace part of the manual labour and simpler mental labour[5] , which not only improves the production efficiency, but also enhances the precision and innovation in the production process, thus effectively improving the quality of products and services.

Through the basic combing of the above concepts, AI can promote enterprise innovation and development in many aspects, from simply replacing mechanical labour, to alleviating the friction cost between the mismatch of link elements to deriving a new production model... AI gives the characteristics of machine intelligence, which makes it able to replace part of the manual labour and the simpler mental labour, and not only improves the It not only improves the production efficiency, but also enhances the precision and innovation in the production process, which effectively improves the quality of products and services (Yao Jiaquan et al., 2024)[32] .

2.2 Literature research on enterprise innovation

Enterprise innovation is of vital significance to the enterprise itself, the development of the industry and even the progress of society. For the enterprise itself, enterprise innovation is the direct path that affects the development of the enterprise; for the industry, enterprise innovation is the core driving force that promotes the development of the industry; for social progress, enterprise innovation is an important engine that promotes economic growth and social progress. Therefore, many scholars have discussed and explored this aspect of enterprise innovation:

Table 2 Definition of enterprise innovation

Author	Time	Main content
Holmstrom	1989	Corporate innovation is a complex activity with high investment, high risk, and irreversible investment.
Zhang Xuan et al.	2017	Corporate innovation has a huge demand for capital.
Kou Zonglai and Liu Xueyue	2020	Enterprises are the microscopic main body of innovation activities, and their innovation activities are the key to improve production efficiency and core competitiveness, and the foundation and internal driving force for the implementation of innovation-driven development[35] .
Yu Jingwen and Chen Haijian	2024	Adequate financial support is a key factor in significantly increasing firms' innovation investment[34] .
Huang, Suanqin et al.	2025	At the firm level, firm innovation is influenced by many heterogeneous factors such as corporate governance, financial characteristics and managerial demographic characteristics[33].

Since 1989, when Holmstrom first proposed that corporate innovation is characterized by "high investment, high risk, and irreversible investment", subsequent research has been deepening. Researchers have

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further defined corporate innovation from the dimensions of capital demand, subject position, key input factors and influencing factors. With the advancement of the research, the direction is also gradually from the exploration of enterprise innovation demand, in-depth to the analysis of the specific influence mechanism and realisation path of enterprise innovation.

2.3 Comprehensive Review

Existing research has centred on the influence mechanism and path of industrial robots and artificial intelligence technology on enterprise innovation to carry out in-depth discussions in different aspects. Artificial intelligence, as a knowledge production meta-technology, can be directly applied to the research and innovation process to improve the technical level on which the economic and social operation depends, so as to achieve innovation-driven economic growth (Chen Nan, Cai Yuezhou, 2022)[8] , It can not only promote the development of macro-economy, change the structure of labor force and income distribution, but also profoundly affect the process innovation, production efficiency and environmental performance of micro-enterprises, which is the key driving force for the new round of scientific and technological revolution and industrial transformation. (Zhang Zhu et al., 2025)[14] .

However, there are still many problems in the practical application of AI in enterprises, and the emergence of these problems is closely related to the heterogeneity of the technology, enterprise heterogeneity and industry characteristics: First, the developmental impact of AI on enterprise innovation is significantly dependent on the company's long-term investment and departmental co-ordination, and does not fit the pursuit of short-term benefits of some enterprises, which results in the use of AI by enterprises is less than expected; second, many enterprises do not provide support services for employees when they use AI in practice; second, many enterprises do not provide support services for employees when they use AI in practice. Secondly, many enterprises do not provide their employees with synchronised organisational learning and use skills when using AI, which makes AI in the actual application of enterprises appear many faults, resulting in it can not play its practical role in practical application. - AI requires massive data and continuous training, if there is a lack of data accumulation and employees' data interpretation skills, it is easy to fall into the cycle of "Insufficient accuracy of the model-poor application effect-stagnation of investment". Thirdly, there is the problem of enterprise heterogeneity witg the use of AI by different enterprises. Enterprises with high absorptive capacity are more likely to balance long-term investment and short-term benefits, and can quickly transform AI technology into the results of local process optimisation. AI technology can be quickly transformed into local process optimisation results, while SMEs with a weak digital foundation tend to use AI less effectively due to insufficient data governance capabilities, organisational learning faults and other issues.

3. the development of artificial intelligence status quo, problems and motivation analysis

Currently, artificial intelligence technology is developing rapidly, and plays a pivotal role in influencing enterprise innovation. With the aging of the population and the reduction of the proportion of new births, the loss of labour is serious, leading to the price of labour is gradually high. Against this backdrop, the impact of AI on the innovation aspect of business is of paramount importance.

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3.1 Practical application of AI in enterprises

In terms of practical application, as an important part of AI, the application of industrial robots in China's manufacturing industry has entered a phase of explosive growth. As shown in Figure 2, as of 2023, the density of robots in the manufacturing industry climbed to 470 per 10,000 people, equivalent to nearly three times the global average, and behind this data is undoubtedly inseparable from the accelerated advancement of China's manufacturing industry's intelligent transformation.

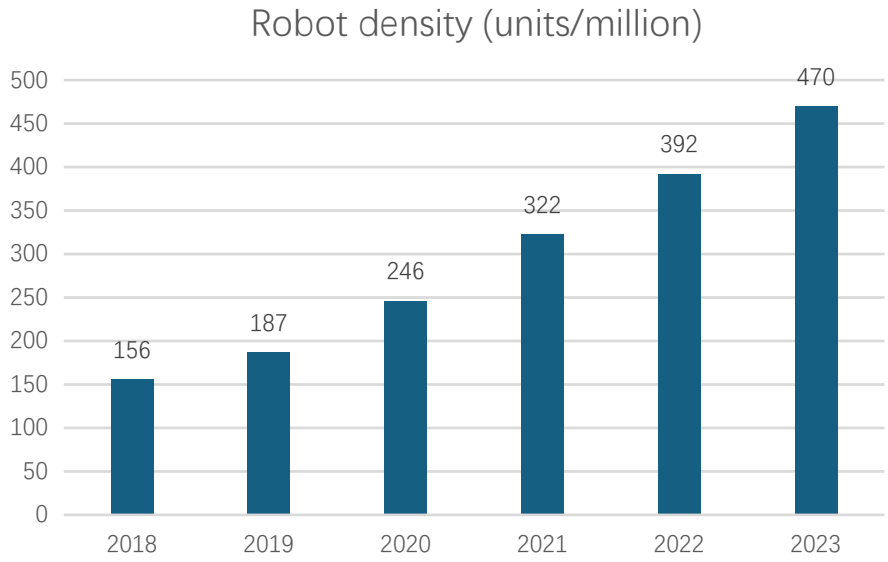

Figure 2 2018-2023 robot density statistics

Source World Robotics Report 2024

Another indicator that proves that the industry has widely applied robotics in the production process is the robot penetration rate of technology-intensive industries in the industry (Zhao Jianbo,Liu Zhao, 2025)[11] , and the number of patents that can represent the investment and innovation ability of enterprises in the industry in robotics-related technology research and development.

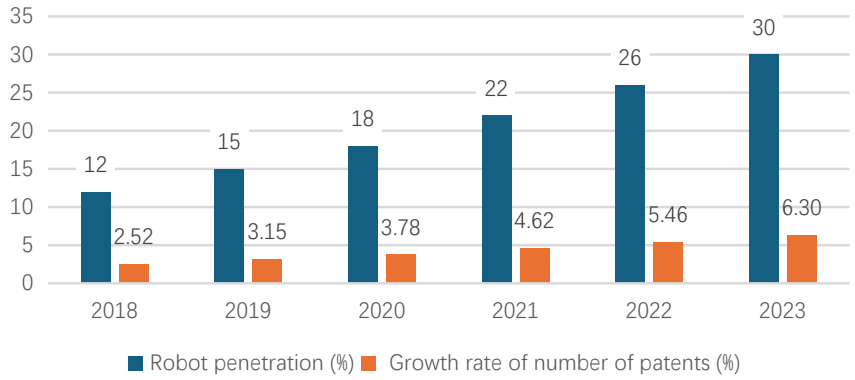

Figure 3 Robot penetration rate and number of patents in technology-intensive industries, 2018-2023

Source "1-Prefecture-level cities-Robotics Artificial Intelligence and other future industry levels (2009-2023)" dataset

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As shown in Figure 3, from the enterprise level, the industrial robot penetration index of listed companies in the manufacturing industry continues to improve in 2018-2023, and although robot importers account for only 0.493% of the sample companies, their patent applications and R&D investment scale account for 6.21% and 11.74% of the total industry respectively (Feng Ling, 2023) , highlighting the robot application companies' innovative ecological important leading position. In addition, policy support is also a key driving force to promote the use of industrial robot applications by enterprises, this behaviour of enterprises applying industrial robots is regarded as a positive signal of digital transformation by the government, and it is also easier to obtain obvious policy tilts under the current government's innovation policy (Chen Yanxia,Zhang Peng, 2024)[19] . Studies have shown that the scale of government R&D subsidies received by enterprises using robots is 3.6 times larger than that of enterprises not using robots, and such subsidies not only provide direct financial support for enterprises, but also enhance the efficiency of R&D through mechanisms such as regulating innovation behaviours and guiding the rational allocation of resources (Ying Chien-Wei, 2022)[6] .

At the level of market financing, industrial robots as intelligent assets can reduce information asymmetry (Lv Zhenwei,Xie Haiyang, 2025)[17] , reduce the difference in market expectations of enterprises, so that the cost of enterprise financing decreased by 5%-8% (Che Dexin, 2021)[5] . This dual financial support path of "policy subsidy + market financing" also provides a continuous impetus for enterprise innovation.

3.2 Development Issues

Although AI has been deeply integrated into the practice of enterprise innovation, but in the process of technology landing and value transformation, it still faces three structural contradictions that need to be cracked, these problems involve both the underlying logic of technology application and the adaptive reconfiguration of organisational capabilities.

First, at the strategic planning level, enterprises lack a long-term and clear strategic layout for the application of AI. Many enterprises blindly follow the trend of introducing AI technology and only see it as a short-term means to improve performance, without combining it with their core business and innovation goals to formulate systematic application planning.

Second, from the perspective of data security and ethical risks, the effective operation of AI relies heavily on the support of massive amounts of data, which often contain business secrets of enterprises and private information of users. The lack of perfect security measures in the process of data collection, storage and use by some enterprises has led to frequent data leakage incidents, bringing huge economic losses and reputation damage to enterprises.

Thirdly, the limitations of the external environment have also hindered the application of AI in enterprise innovation. On the one hand, the imperfection of relevant laws and regulations makes enterprises face many legal risks in the application of AI technology. For example, there are no clear legal provisions on the attribution of intellectual property rights of AI-generated content and the determination of responsibility for AI decision-making errors, which makes enterprises worry a lot when carrying out innovative activities. On the other hand, the rapid development of AI technology has created an increasingly urgent demand for professional talents, but there is currently a serious shortage of composite talents on the market who understand AI technology and are familiar with the industry's business, and it is difficult for enterprises to recruit suitable talents

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to promote the in-depth fusion of AI technology and innovative business, which has led to the failure of many innovative ideas to be implemented on the ground.

3.3 Analysis of the Motivation of AI-Driven Enterprise Innovation

Although with the assistance of AI, companies can form a positive cycle of "cost saving - technology development", this positive cycle also depends on the absorption capacity of the enterprise itself, i.e., the enterprise needs to have the absorption capacity that matches the capacity of AI when faced with highly intelligent AI technology (Li, Yuhua, 2024). Yuhua, 2024)[3] . Meanwhile, at the level of organisational learning, the degree of matching between AI technology application and the absorptive capacity of the enterprise also largely affects the organisation's adaptive ability to technological change and the innovation efficacy it exhibits. When the organisational learning capacity of the enterprise is insufficient, it is difficult for the enterprise to internalise AI technology into systematic innovation capabilities, which leads to:

Firstly, insufficient learning and absorption of the principles and algorithmic logic of AI technology, which makes the application of the technology stay at the level of "tool use" and fails to correctly perceive the boundaries and risks of its practical application (Liu et al., 2025)[12] . For example, when AI is used in the medical diagnosis field, some doctors may not have a deep understanding of the system's training logic and scope of application, which may lead to the problem of over-reliance on AI diagnosis.

Secondly, the lack of systematic sorting of AI application experience and failure cases makes it difficult to form organisational knowledge assets, resulting in the recurrence of similar problems. Take the global retail giant Target as an example, the enterprise has been committed to research and development of machine learning models to optimise daily sales forecasting and inventory management for many years, claiming that AI can "predict the demand for products and avoid merchandise off-sale".However, the actual situation is that in the process of AI transformation, there are serious problems of shelf shortage and confusion in stores.

Thirdly, the learning inertia of the traditional hierarchical system hinders cross-departmental knowledge flow, preventing the effective transfer of AI technical knowledge between production, R&D and other departments (Liu et al., 2025)[12] . The traditional sectional system emphasises hierarchical and departmental division of labour, and this structure makes it easy to form knowledge barriers, hindering the effective transfer of AI technology knowledge between departments. For example, the R&D department of the OPPO production company had developed an AI-based screen quality inspection algorithm, which can accurately identify tiny scratches and colour differences on the screen, but due to the lack of an effective communication mechanism between the R&D department and the production department, the employees on the production line are still using the traditional manual inspection method and know nothing about the new algorithm, and the advanced technology of the R&D department can not be applied to the production link, which leads to Low production efficiency and unstable product quality.

That is, the stability and innovation effectiveness of the positive cycle of "cost saving - technology development" in the actual application of AI in enterprises is still fundamentally dependent on the absorptive capacity of the enterprise, and when the absorptive capacity is insufficient or mismatched with AI technology, it will lead to problems such as defects in the organisation's learning ability, which is specifically expressed in the insufficient learning of the principles of AI technology, lack of knowledge of AI technology, and the lack

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of knowledge of AI technology. The specific manifestations are insufficient learning of the principles of AI technology, lack of systematic sorting of experience and failure cases, and the traditional hierarchical system that hinders cross-sectoral knowledge flow, which in turn leads to the shallow application of AI, uncontrolled risk, and low innovation effectiveness.

4. Mechanisms and Strategies of AI's Impact on Enterprise Innovation

Under the background of the current deep development of the digital economy, the intervention of AI is gradually affecting the traditional path of enterprise innovation, from the improvement of the efficiency of knowledge acquisition to the reconstruction of the organisational learning mode, from the optimal allocation of innovation resources to the enhancement of the risk response ability, the impact of AI on enterprise innovation has penetrated into all aspects. In-depth investigation of its impact mechanism and put forward targeted strategies will not only help enterprises better grasp the opportunities brought by AI and crack the bottlenecks in the process of innovation, but also provide theoretical and practical guidance for promoting the high-quality development of enterprises and enhancing their core competitiveness.

4.1 Influence mechanism

The impact of artificial intelligence on enterprise innovation is not only from a single dimension, but through multiple mechanisms to work together to form a complex and dynamic impact mechanism. Among them, knowledge spillover and organisational learning as two key paths, empowered by AI technology, break the shackles of the traditional innovation model, reshape the whole process of knowledge flow, transformation and application inside and outside the enterprise, and then have a far-reaching and sustained impact on enterprise innovation. In the following, we will analyse the impact mechanism of artificial intelligence on enterprise innovation mainly from the two levels of knowledge spillover and organizational learning.

4.1.1 Influence mechanism of knowledge spillover on enterprise innovation in the context of AI

Knowledge spillover refers to the phenomenon of unconscious or low-cost acquisition of external knowledge by enterprises in the process of interacting with the external environment. The role of AI is to enable enterprises to acquire new external knowledge in a simpler and low-cost way by summarising and organising external knowledge (Su Taoyong et al., 2025)[15] , and widely disseminate and share it, thus reshaping the innovation mode of enterprises (Fang Haochao, 2024) [7].

In the past, under the traditional operation mode, the way of acquiring external knowledge of enterprises are often severely limited by manpower, and can only be achieved through manual visits and surveys, industry exchanges and cooperation in research and development, and other methods that require high labour costs, which undoubtedly makes the enterprise need to spend a lot of financial and material resources in the acquisition of external knowledge, and even very often can not guarantee that the timeliness and accuracy of the information. The existence of artificial intelligence makes this aspect of the cost can be greatly reduced, artificial intelligence can use natural language processing, network crawlers and knowledge mapping and other diversified technologies to monitor all kinds of information related to the enterprise in real time, to strengthen

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the knowledge spillover effect, to eliminate the knowledge and technology barriers between enterprises, so as to effectively achieve the flow of knowledge between members, sharing, creation and innovation (Fang Haochao, 2024) [7]. AI can also play an indispensable role in the cooperation between enterprises, and the application of AI technology can help enterprises better demonstrate their financial status, reduce the difference in the market's expectations of the enterprise, and obtain innovative financial support from the government or investment institutions.

In addition, AI can also affect the innovation chain resilience through knowledge spillover, which in turn affects corporate innovation. Artificial intelligence enhances the resilience of the supply chain and industrial chain through knowledge spillover from both the industry and industry-university-research cooperation. When facing various shocks, AI can detect and provide early warning through the clues in the information collected from various sources, so as to reduce the impact of external risks on the supply chain and industrial chain of enterprises as much as possible. And with the knowledge spillover, the self-learning ability of artificial intelligence can also be optimised, which can transform the results of the knowledge spillover into sustainable innovation momentum, and enhance the innovation ability and level of enterprises.

4.1.2 Influence mechanism of organisational learning on enterprise innovation in the context of AI

In addition to the influence of different enterprises and different industry characteristics on enterprise innovation in the context of artificial intelligence, organisational learning also plays a crucial role in enterprise innovation. At the knowledge acquisition level, traditional organisational learning relies on artificial research or limited channels for knowledge acquisition, while AI automatically identifies knowledge related to corporate innovation goals through natural language processing, machine learning and other technologies, which improves the width and breadth of knowledge acquisition; at the knowledge transformation level, the wide application of AI can more efficiently help companies transform fragmented knowledge into systematic and usable capabilities; and at the knowledge application level, AI can help companies turn fragmented knowledge into systematic and usable capabilities; and at the knowledge application level, AI can help companies transform fragmented knowledge into systematic and usable capabilities. In terms of knowledge application, AI can accelerate the transformation of innovation results from "concept" to "value" by improving the efficiency and scope of knowledge application. AI and employees can "run in both directions" in organisational learning, and AI itself becomes a "participant" in organisational learning, continuously learning and optimising through interaction with human employees, forming a "human-computer collaborative learning" mode, and promoting enterprise innovation in technology, processes and business models.

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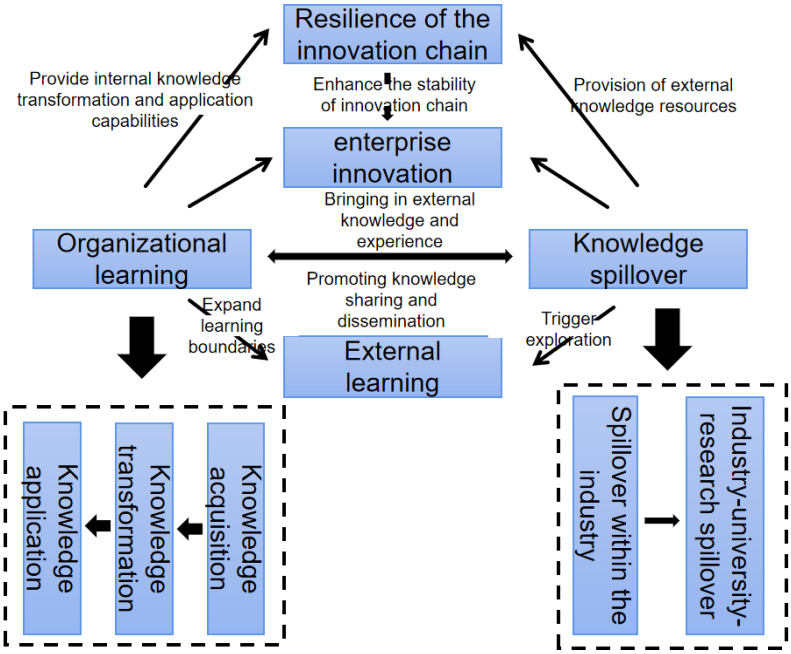

Figure 4 Path analysis of the impact of knowledge spillover and organisational learning on enterprise innovation in the context of artificial intelligence.

In summary, the impact mechanism of artificial intelligence on enterprise innovation is shown in Figure 4, which is mainly to strengthen organisational learning and knowledge spillover through external learning, thus enhancing the resilience of the innovation chain and further promoting enterprise innovation.

4.2 Specific strategies for enterprise innovation in the context of artificial intelligence

Based on the research on the mechanism and practice path of AI-enabled enterprise innovation, combined with the scene characteristics of technology application and organisational adaptation law, we now propose a systematic action framework at the level of strategic implementation to provide target guidance for enterprises to crack the bottleneck of AI innovation:

First, enterprises can further strengthen the knowledge spillover effect brought by AI drive, give full play to the advantages of AI in information acquisition, and efficiently search and retrieve all kinds of information through AI, so as to reduce the cost consumption in the information collection process, and invest the saved resources in R&D and other innovative activities. For example, enterprises can use AI technology to build a knowledge network covering industry dynamics, technological frontiers, market demand and other information, and reduce the cost of information acquisition and improve its accuracy through intelligent search and real-time update functions.

Second, establish a hierarchical and classified human-machine cooperative training system to improve the efficiency of human-machine cooperation and enhance the organisation's absorption capacity. At the same time, we advocate that enterprises should carry out long-term and regular employee AI skills training, according to the needs of different positions, targeting to teach employees how to use AI, so that employees can be

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skilled in the use of AI tools, but also the output of the machine information into the innovation of the enterprise's kinetic energy, so as to improve the efficiency of the transformation of knowledge of the staff, and thus enhance the company's overall absorptive capacity.

Third, we can consider appropriately breaking the separate collaboration between different departments, reconstructing the organisational structure of the enterprise to adapt to the advantages and disadvantages of AI, and breaking the departmental barriers of innovation resources. For example, we can learn from the "AI experience optimisation team" set up by Huawei's consumer business unit, whose main members are algorithm engineers, product designers and offline shop buyers: buyers are responsible for collecting users' feedback on the use of the mobile phone's voice assistant, algorithm engineers optimise the semantic recognition model accordingly, and product designers iterate on the technical The product designer transforms the results of technology iteration into new functional solutions. This structure breaks the traditional departmental boundaries, allows AI technology innovation to quickly land along the business chain, and avoids the waste of resources due to the disconnection between technology development and market demand.

5. Conclusion and Recommendations

Based on the previous analysis, this chapter will summarise the research results, distill the main conclusions, and put forward targeted and operable recommendations for the problems existing in the process of applying AI to promote innovation, so as to provide reference for enterprises to better use AI to promote innovation.

5.1 Research Conclusions

Artificial intelligence has significant advantages in data collection, processing and modelling, enabling enterprises to make scientific decisions based on big data and accurately identify the direction of innovation and market demand. Through the integration and analysis of technology trends, user preferences, competitive dynamics and other information, AI can assist enterprises to identify potential opportunities in a forward-looking manner, avoiding innovation miscalculations caused by path dependence or experience limitations.

Firstly, industrial robots are shining in the production process of enterprises. They can accurately and tirelessly replace a large number of repetitive tasks. This not only greatly reduces production errors caused by human fatigue or operational errors, but also saves companies considerable labour costs. The monotonous work that originally required a large number of workers to complete now requires only a small number of technicians to operate and maintain the robot, and the enterprise has been effective in controlling manpower expenditures.

Secondly, AI can also effectively predict the direction of enterprise development by virtue of massive data and mathematical models, and thus make suggestions for enterprise development. For example, in the field of marketing, AI can provide powerful support for enterprises to formulate accurate marketing strategies through comprehensive analysis of consumer behaviour data and market trend data.

Third, although artificial intelligence provides strong support for enterprise innovation, there are obvious limitations to its role. The effectiveness of the existing application mechanism is highly dependent on the

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enterprise's organisational learning ability and willingness to continue to optimise, and when the enterprise's absorption capacity is insufficient - for example, when employees do not have an in-depth understanding of AI tools and there are barriers to cross-sectoral knowledge transfer - the effect of technological empowerment will be significantly weakened.

Fourthly, from the perspective of mechanism, AI mainly affects enterprise innovation through knowledge spillover and organizational learning. Under the knowledge spillover path, AI helps enterprises to obtain innovative resources such as external technical experience and market dynamics at low cost and break down information barriers through technologies such as natural language processing and knowledge mapping; in the organizational learning path, AI, as the carrier of "human-computer collaboration", not only accelerates the transformation and application of internal knowledge, but also promotes the synchronous upgrading of employee skills and technology iteration. The two paths support each other: knowledge spillover provides material for organizational learning, while organizational learning transforms external knowledge into endogenous innovation capability, which together constitute the core logic of AI-enabled enterprise innovation.

5.2 Recommendations

Innovation is the first power to promote high-quality economic development, is an important strategic support for the construction of a modernised economic system, the Party Central Committee has repeatedly stressed the importance of innovation[36] . And artificial intelligence as the core technology to reshape the innovation mode of enterprises, the full release of its application effectiveness is directly related to the realisation of this strategic goal. Based on the above logic, when AI encounters problems such as insufficient adaptability, fault of organizational collaboration, and even negative effects such as internal friction of innovative resources due to improper application, it is not possible for a single subject to crack independently, and it is urgent to build a multi-party collaborative system of "enterprise-led practice, government-improved ecology, and industry-coordinated linkage".

Firstly, Enterprises should strengthen the AI-driven knowledge spillover effect and invest the saved information collection costs in research and development; at the same time, they should improve the efficiency of human-machine collaboration, cultivate the compound ability of employees through skills training, so as to enhance their own absorptive capacity, and also consider breaking departmental barriers by restructuring the organisational structure, so as to promote the flow of knowledge.

Secondly, The government can continuously optimize the policy environment, provide support for knowledge spillover and organizational learning of enterprises, and provide corresponding help to enterprises at different stages of development in different stages, such as building a "cloud platform" for small and medium-sized enterprises to minimize the cost of knowledge acquisition for small and medium-sized enterprises, while for large enterprises. As far as possible, enterprises can maximize the use of AI for enterprise innovation.

Thirdly, The government can regularly hold relevant forums and exchanges to share the difficulties and advantages of AI in practical application in enterprise innovation; In addition, an online case base can be further established to collect AI innovation cases according to the classification of "industry + scenario + problem type", with details such as technical principles, implementation steps, cost and benefit, so as to facilitate en-

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terprises to inquire and draw lessons from, thus promoting the substantive use of AI in helping enterprises to innovate.

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