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Exploration of the Deep Integration Mechanism of Talent, Innovation, and Industry Chains: Strategies and Practical Research on Building High-Level Technological Innovation Platforms

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Abstract: This study focuses on the exploration and practice of the deep integration of the talent chain, innovation chain, and industrial chain in Jiangsu Province. By reviewing the policy background and implementation paths of Jiangsu, the role of the integration of these three chains in promoting the development of high-level technological innovation platforms is analyzed, revealing key success factors such as talent cultivation, industry-university-research cooperation, and intellectual property protection. The study shows that through optimizing resource allocation, strengthening regional cooperation, and enhancing policy support, Jiangsu has initially realized effective linkage of the three chains, improving the efficiency of innovation results transformation and promoting the development of new productivity. The study also proposes policy recommendations to further optimize talent training mechanisms, increase support for technology transformation, strengthen intellectual property protection, and deepen regional cooperation, aiming to provide reference for innovation-driven development in Jiangsu Province and nationwide.

1. Introduction

With the rapid development of global technology and industry, the deep integration of the talent chain, innovation chain, and industry chain has become a key factor in promoting high-quality regional economic development. In knowledge-intensive economies, innovation-driven development relies on high-end talent and strong industrial support. The synergy of these three elements effectively promotes the transformation of scientific and technological achievements, industrial upgrading, and economic transformation. Currently, Jiangsu Province, as a developed

economic region in China, faces the dual demand of industrial restructuring and high-level technological innovation. It urgently needs to build high-level technological innovation platforms to achieve the effective integration of talent, innovation, and industry[1]. In this context, Jiangsu actively promotes the integration of the three chains, constructing and improving the technological innovation ecosystem, aiming to promote efficient linkage of talent introduction, technological innovation, and industrial development, enhance regional competitiveness, and improve the efficiency of innovation results transformation[2]. This study, based on Jiangsu's practice, explores strategies and paths for building innovative platforms that promote the deep integration of talent, innovation, and industry, providing theoretical support and practical references for regional innovation-driven development.

2. Theoretical Foundation and Literature Review

In the context of accelerating globalization and digitization, the integrated development of the talent chain, innovation chain, and industry chain has become a core strategy for regional economic growth and technological advancement. The concept of three-chain integration originates from industrial economics and regional development theory, emphasizing the collaborative role of innovation entities (such as enterprises, universities, research institutions, etc.) in talent cultivation, technological research and development, and industrial application, to achieve efficient resource allocation and enhance regional innovation capabilities. A large body of domestic and international research indicates that three-chain integration not only accelerates the transformation of scientific and technological achievements but also enhances regional competitiveness. For example, developed countries such as those in Europe and America have fostered market-oriented innovation ecosystems through industry-university-research cooperation, accelerating the application of technological achievements and industrial upgrading.

In China, with the deepening implementation of the "14th Five-Year Plan," Jiangsu Province has strongly supported the integration of the three chains at the policy level[9]. Through optimizing talent introduction policies, improving the technological innovation system, and encouraging corporate innovation, the province has effectively promoted local economic growth. The increase in the number of high-tech enterprises and enhanced innovation capabilities in Jiangsu provide a solid foundation for exploring the path of three-chain integration. As a leader in China's innovation-driven development economy, Jiangsu has gradually establish[4].

3. Analysis of the Current Situation of Three-Chain Integration in Jiangsu Province

3.1 Current Status of the Talent Chain

Jiangsu Province has made significant progress in attracting, cultivating, and retaining high-end talent. The government has launched initiatives such as the "Northern Jiangsu Talent Development Plan" and the "Southern Jiangsu Innovation Talent Plan," offering targeted funding, housing subsidies, and research support to attract top domestic and international talent to work and start businesses in Jiangsu. The province has also established joint talent cultivation mechanisms in collaboration with universities, research institutions, and enterprises, using an industry-university-research integrated model to enhance the quality of the talent pool. However, challenges such as high talent mobility and a relative lack of core technical talents continue to constrain further development of local technological innovation.

3.2 Current Status of the Innovation Chain

The construction of the innovation chain in Jiangsu Province aims to support technological innovation and the transformation of results, gradually forming a complete system from basic research to secondary technological development and then to industrialization. In recent years, the province has increased investment in research and development (R&D), project support, and the cultivation of high-tech enterprises. According to local statistics, Jiangsu ranks among the top in the country in terms of R&D investment intensity and boasts numerous national and provincial key laboratories and innovation platforms. However, Jiangsu still faces challenges such as a disconnect between innovation resources and market demand, and slow technology transfer, requiring further efforts to strengthen the effective alignment of scientific and technological resources with market needs.

3.3 Current Status of the Industry Chain

Jiangsu's industrial structure is primarily focused on advanced manufacturing and modern services, covering high-tech fields such as new materials, biomedicine, and information technology. In recent years, the province has actively promoted the transformation of traditional manufacturing industries towards intelligence and high-end technology while continuously increasing support for emerging industries. It is committed to cultivating high-level industrial clusters that match the needs of innovation-driven development. Additionally, local governments have strengthened cooperation with universities and research institutions in the process of industrial upgrading, introducing cutting-edge technologies and advancing independent technological R&D, which has enhanced the competitiveness of local industries[6]. However, problems such as insufficient collaboration along the industrial chain and a low level of self-reliance in core technologies continue to hinder the development of high-level industrial chains in Jiangsu.

In conclusion, Jiangsu Province has established a solid foundation for the integration of the talent chain, innovation chain, and industry chain. However, there is still room for improvement in policy support, resource sharing, and chain coordination to achieve efficient integration of the three chains and promote high-quality regional economic development[5].

4. Core Strategies for Building High-Level Technological Innovation Platforms

4.1 Talent-Led Strategy

High-level innovation talent is the core driving force behind technological innovation[7]. Jiangsu Province should enhance mechanisms for attracting high-end talent, expand international cooperation channels, and attract overseas talent to build a global talent network. Furthermore, the province should deepen the integration of industry, academia, and research by establishing joint talent cultivation mechanisms between local universities and enterprises. This will create a talent development pathway from academia to industry, breaking down the "last mile" barriers in the transformation of knowledge outcomes. Additionally, measures such as optimizing living conditions, career development channels, and research funding support will enhance the attractiveness and retention of high-level talent, ensuring the stability and sustainability of the talent chain.

4.2 Innovation-Driven Strategy

Innovation is key to constructing high-level technological platforms. Jiangsu Province should strengthen the two-way collaboration between basic and applied research within the existing

innovation system, establish high-level research projects, and allocate special funds to support technological breakthroughs. At the same time, the province should build platforms for the commercialization of scientific achievements, encourage close cooperation among enterprises, universities, and research institutions, and accelerate the industrialization process of technological achievements. Moreover, a comprehensive innovation performance evaluation mechanism should be established to ensure that innovation activities align with market demand, enhancing the overall efficiency of the innovation chain[8].

4.3 Industry Demand-Oriented Strategy

Jiangsu Province should build innovation platforms guided by market demand, integrating emerging technologies with industry needs[10]. By promoting the construction of industry alliances and facilitating the integration of resources between upstream and downstream enterprises, competitive industrial clusters can be formed to enhance the province's technological strength in fields such as intelligent manufacturing, new energy, biomedicine, and environmental protection. Local governments should also encourage enterprises to participate in intellectual property layout and technical standard formulation, improving the level of self-reliance in core technologies. Additionally, the digital transformation of key industries should be promoted, using big data, artificial intelligence, and other technologies to optimize the industrial chain and achieve efficient resource allocation.

4.4 Policy Support System

To ensure the long-term effectiveness of three-chain integration, Jiangsu Province should further improve its policy support system by establishing a comprehensive set of incentives covering financial support, tax benefits, intellectual property protection, and local market resources[12]. The government should increase funding for innovation platforms, implement policies that support innovation-driven development, and focus on high-level projects, outstanding talents, and core technology R&D. Furthermore, the regulatory framework should be optimized to improve policy transparency and create a fair and efficient business environment, attracting high-quality innovation resources to gather in Jiangsu and fostering a favorable innovation ecosystem[11].

In conclusion, Jiangsu Province can accelerate the construction of high-level technological innovation platforms and achieve deep integration of the talent chain, innovation chain, and industry chain through the four core strategies of talent-led, innovation-driven, industry demand-oriented, and policy support. This will provide strong support for regional economic development.

5. Practical Pathways for Building High-Level Technological Innovation Platforms

5.1 Establishing Regional Collaborative Innovation Networks

Building a high-level technological innovation platform requires a foundation of regional collaboration to form a comprehensive and multi-level innovation network. Jiangsu Province can leverage core cities like Nanjing and Suzhou, rich in innovation resources, to create an innovation network that spans the entire province, promoting cross-regional flows of technology, talent, and capital. By strengthening innovation cooperation between cities within the province, a "core-driven, regional linkage" model can be formed, facilitating the sharing and utilization of innovation resources. Additionally, Jiangsu should fully take advantage of the national Yangtze River Delta regional integration strategy, collaborating with Shanghai and Zhejiang to build a cross-provincial

collaborative innovation ecosystem[12].

5.2 Strengthening the Integration of Industry, Academia, and Research Platforms

Industry-academia-research collaboration is an important bridge for the transformation of scientific and technological achievements. Jiangsu Province should encourage universities, research institutes, and enterprises to jointly build innovation carriers such as laboratories and technology research centers, and promote the rapid application of scientific research achievements to production lines through the "government-industry-academia-research-application" integrated model. Local governments can establish special funds to support industry-academia-research projects, facilitating deep cooperation between researchers and enterprise technical teams, ensuring the seamless connection of the innovation chain. At the same time, by setting up platforms for technology achievement transactions, the province can accelerate the commercialization process of scientific and technological achievements, enhancing the vitality and competitiveness of the industrial chain.

5.3 Developing Innovation Incubation and Acceleration Systems

Jiangsu Province should build a comprehensive innovation incubation system, encouraging early and small investments to support the growth of start-ups and innovative projects. By developing innovation parks, technology business incubators, and industry accelerators, a full lifecycle service chain from project incubation to market promotion can be formed. The government can provide policy support, funding, and resource matching to help start-ups overcome challenges such as financing, technology, and market access. Additionally, by attracting venture capital and encouraging large enterprises to establish internal incubation projects, Jiangsu can accelerate the rapid growth and commercialization of innovation outcomes, improving the transformation capabilities of the innovation chain.

5.4 Enhancing Digital and Intelligent Innovation Capabilities

In the process of building high-level technological innovation platforms, Jiangsu Province should accelerate the application of digital and intelligent technologies to meet the needs of modern industrial development. By utilizing technologies such as big data, cloud computing, and artificial intelligence, the province can build intelligent research, production, and management systems, significantly improving the efficiency of innovation resource allocation. Particularly in key areas such as intelligent manufacturing, biomedicine, and electronic information, traditional industries should be pushed to transform and upgrade toward intelligence. At the same time, relying on digital technologies, Jiangsu can establish real-time information-sharing platforms for the upstream and downstream of the industrial chain, enabling seamless connections and efficient collaboration between enterprises.

5.5 Strengthening Intellectual Property Protection and Management

Intellectual property protection is a key guarantee for stimulating innovation. Jiangsu Province should strengthen intellectual property protection, improve its management and service systems, and provide legal support and rights protection for innovation entities. By establishing intellectual property service centers and creating dispute mediation mechanisms, the province can help enterprises and research institutions effectively safeguard their rights and reduce innovation risks. Additionally, enterprises should be encouraged to actively engage in patent layout, improving the

quantity and quality of independent intellectual property rights, thereby enhancing the added value of the innovation chain and industrial chain.

In summary, through regional collaboration, industry-academia-research integration, innovation incubation, digital empowerment, and intellectual property protection, Jiangsu Province will gradually build an efficient, high-level technological innovation platform. This will provide strong support for the deep integration of the talent chain, innovation chain, and industrial cha

6. Practice Results and Challenges of the Three-Chain Integration Model in Jiangsu Province

6.1 Practice Results

Jiangsu Province has achieved positive results in the integration of the talent chain, innovation chain, and industrial chain. By attracting high-level talents and nurturing local talents, the province has made technological breakthroughs in many high-tech fields. Innovation clusters in cities such as Nanjing and Suzhou have formed a complete innovation ecosystem, from basic research to commercialization, driving the rapid development of industries like intelligent manufacturing, new materials, and biomedicine. In the northern Jiangsu city of Yancheng, the Environmental Protection Science and Technology City has become a unique high-tech industrial development zone named for environmental protection, relying on collaborations with well-known universities and institutes, such as the Chinese Academy of Sciences, Nanjing University, and Tsinghua University, to bring in 22 research institutions. This has resulted in the formation of high-level technology innovation teams and the incubation of high-tech enterprises, creating a collaborative development model for technological innovation, talent cultivation, and industrial incubation. In addition, Jiangsu has accelerated the transformation of scientific achievements through the establishment of industry-academia-research platforms, facilitating deep connections between the innovation chain and industrial chain. With strong policy support, many enterprises in the province have set up patent protection systems, enhancing technology self-sufficiency and market competitiveness.

6.2 Challenges

Despite significant achievements, Jiangsu faces several challenges in the integration of the three chains. The first issue is the flow of talent, particularly the loss of core technical talents, which affects the sustainability of the innovation chain. Second, some key technologies in the innovation chain are still constrained by the international market, with insufficient independent intellectual property rights and core technologies. In the industrial chain, some traditional industries are slow to transform and upgrade, and the application of innovation outcomes in small and medium-sized enterprises remains limited. Additionally, the uneven distribution of innovation resources across regions restricts the deepening of three-chain integration. Finally, although there is strong policy support, the actual utilization efficiency of some enterprises and research institutions still needs improvement.

6.3 Future Outlook

To address these challenges, Jiangsu needs to strengthen the introduction and cultivation of high-end talents and establish a more comprehensive talent retention mechanism. It is also essential to enhance the independent research and development capabilities of core technologies, reduce dependence on external markets, and improve the autonomy of the innovation chain. For the transformation of the industrial chain, the province should promote the widespread application of digital and intelligent technologies and encourage small and medium-sized enterprises to actively

participate in innovation platforms. Furthermore, by establishing a more balanced regional collaborative innovation network, Jiangsu can achieve resource sharing and complementary advantages, providing strong support for the deep development of the three-chain integration. This will lay a solid foundation for Jiangsu's high-quality development.

7. Summary and Outlook

Jiangsu Province has made significant strides in advancing the deep integration of the talent chain, innovation chain, and industrial chain. The province has gradually built a high-level technological innovation platform with regional characteristics, injecting strong momentum into the high-quality development of the provincial economy and industries[3]. By focusing on key aspects such as talent leadership, innovation-driven development, industrial upgrading, and policy support, Jiangsu has achieved initial success in connecting the three chains effectively, creating a favorable ecosystem for industry-academia-research collaboration and enhancing the competitiveness of strategic industries like intelligent manufacturing, new energy, and biomedicine.

Looking ahead, Jiangsu should continue optimizing the three-chain integration mechanism, strengthen the coordination of innovation resources, and gradually improve the efficiency of transforming scientific achievements. By continuously attracting high-level talents, increasing investment in basic research, and strengthening intellectual property protection, Jiangsu can further solidify its competitive position in innovation. Additionally, through regional collaboration, Jiangsu can leverage the Yangtze River Delta integration strategy to form deeper resource sharing and technical cooperation with surrounding areas, building an open and efficient innovation ecosystem to maintain its le

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