

# Research on the Construction of Science and Technology Innovation City in Tai'an City and Its Countermeasures

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**Abstract**—Under the emerging wave of scientific and technological globalization, innovation-driven development has gradually become a consensus. Based on the relevant theoretical foundations, this paper analyzes the problems and reasons of urban innovation in Tai'an, argues that scientific and technological innovation city is a more specific development form of innovative city, highlights the leading role of scientific and technological innovation in urban development, and puts forward that scientific and technological innovation leads development as an inevitable choice and strategic practice for Tai'an to achieve high-quality development according to the current domestic scientific and technological innovation city judgment standards and the current situation of Tai'an construction.

**Index Terms**—Science and technology innovation city; the ability to innovate; innovation system

## I. INTRODUCTION

At present, with the deepening of the scientific and technological revolution and industrial transformation, relying on the "smart key" of "innovation" to open a new situation of high-quality development has become the consensus and common action of all countries in the world.

Tai'an has a long history of development and deep cultural heritage. However, traditional ideas and concepts are deeply rooted, the atmosphere of innovation culture is lacking, land resources are relatively scarce, and there are shortcomings in the development of strategic emerging industries, especially in the construction of science and technology innovation cities in advanced and developed areas, and there are also outstanding shortcomings such as difficulty in attracting end-end talents, few cutting-edge achievements in docking, weak focus on characteristic industries, insufficient layout of industry-university-research cooperation platforms, and insufficient integration of innovative talent industry chains. Therefore, Tai'an City to build a regional scientific and technological innovation highland, the general trend, the right time, and rare opportunities.

## II. PROBLEMS IN THE CONSTRUCTION OF SCIENCE AND TECHNOLOGY INNOVATION CITIES

(1) The advantages of scientific and technological innovation agglomeration are not outstanding

First, the demonstration and leading role of local

enterprises is not strong. Some enterprises, especially small and micro enterprises, believe that the return period of transformation and upgrading is long, the risk of R&D is greater, and their innovation initiative and staying power are not enough. Second, high-level enterprises are not attracting enough. Due to the intensification of high-level innovation-leading enterprises such as billion, billion, and tens of billions of enterprises, and headquarters economy, the city has attracted such enterprises to face fierce competition. Third, the atmosphere of the regional innovation environment is not strong, people's ideological concepts and behavior patterns are relatively solidified, and the idea of small wealth is security, seeking stability and fearing change is still very common.

(2) Scientific and technological innovation does not support industrial development enough

With the acceleration of industrialization, traditional resource-intensive industries and labor-intensive industries have been unable to meet the current needs of innovation and development. The distribution of traditional industries in the city is mostly concentrated at the low-end level, and most of the traditional small and medium-sized enterprises such as disposable consumable-type medical devices, weak current cables and mechanical processing supporting facilities are the most, and there is a lack of leading innovative enterprises.

(3) The role of the innovation carrier platform is not enough

First, the carrier utilization rate is not high. The existing science and technology industrial complex in Tai'an City generally has the problem of idle space resources, and the utilization rate of the area put into use has only reached half of the area built, resulting in a waste of innovative resources. Second, the quality of the settled enterprises is not good. There are only ten high-tech enterprises in the complex. Third, the operation of the complex is unprofessional, has not formed an effective benchmarking and agglomeration effect, and has not fully played the role of the "main position" of scientific and technological innovation.

(4) The quality of the innovative talent team is not good

First, there is a lack of innovative talents in science and technology enterprises, and there are more talent needs at different levels in high-end equipment, intelligent medical care, new materials, new energy and other industrial fields. Second, the advantages of the talent service policy are not



outstanding. There is still a gap between the city's talent support policy and advanced areas, and the existing talent innovation benefits are not obvious, and there is a big gap with advanced areas.

### III. ANALYSIS OF THE CAUSES OF PROBLEMS IN THE CONSTRUCTION OF SCIENCE AND TECHNOLOGY INNOVATION CITIES

(1) The top-level system design of science and technology innovation city is not perfect

First, the layout of industrial planning is not clear. Tai'an's industrial planning and industrial layout are not clear enough, a complete industrial chain has not yet been formed, and related industries cannot obtain agglomeration dividends, resulting in its lack of core competitiveness in attracting high-level enterprises. Second, the assessment and evaluation of scientific and technological innovation and development is not systematic, and a scientific and complete assessment and evaluation supervision system has not been formed at the level of Tai'an City, and there is a lack of quantifiable assessment indicators for the completion of various work. Third, the investment in science and technology management funds is insufficient, the long-term growth mechanism of science and technology management funds has not been established, and the role of financial funds in guaranteeing and stimulating is not outstanding.

(2) The integration of science and technology and industrial development is not enough

First, the deployment of innovation chains around the industrial chain is not enough. The existing scientific and technological innovation resources have not been accurately connected with leading industries, and the leading and supporting role in industrial development and enterprise transformation is not obvious enough. Enterprises have insufficient independent innovation capabilities, and there are currently few science and technology enterprises engaged in new product research and development and production in Tai'an, and most of them have insufficient research and development capabilities. Second, the development of the innovation chain service industry chain is not enough. The interconnection between enterprises, scientific research institutes and universities needs to be further improved, and the compatibility between scientific research results and the market needs to be further strengthened.

(3) The quality of the innovation carrier platform is not good

First, the characteristics of the innovation carrier industry are not obvious. Although there are many enterprises in the industrial complex, the innovation ability is not strong, and it is difficult to drive the transformation and upgrading of local industries. Second, the surrounding supporting facilities of the innovation carrier platform are not perfect. At present, the complex of Tai'an City is mainly concentrated in the eastern region, although the area is planned to build high-speed rail, hospitals, schools, but they are currently in the construction or initial construction stage, the imperfect living facilities, affecting the attraction of high-quality platform enterprises.

Third, the good ecology of enterprise development needs to be improved.

(4) Innovation is not well targeted from attracting and cultivating

First, talent attraction has not been organically combined with industrial characteristics. In the process of recruiting talents and attracting wisdom, there is a lack of talent attraction that is compatible with the industry, and there are many "indicative" talent introductions, resulting in a lack of talent introduction in key areas. Second, talent projects lack special capital investment. Tai'an's talent project support funds are still mainly based on financial investment, market resources have not yet been introduced, and a diversified talent fund investment system has been established, and the role of venture capital funds in project financial support has not been fully played.

### IV. COUNTERMEASURES AND SUGGESTIONS FOR THE CONSTRUCTION OF TAI'AN SCIENCE AND TECHNOLOGY INNOVATION CITY

(1) Accelerate the formation of innovation agglomeration advantages

1) Build industrial clusters with strong driving force

With provincial-level economic development zones as the carrier, promote the formation of strategic emerging industries, develop hydraulic equipment and intelligent manufacturing industries, and focus on the development of strategic emerging industries such as high-efficiency and advanced environmental protection equipment, intelligent measurement and control equipment, major complete sets of equipment manufacturing, and new energy vehicle support; Relying on Tai'an City, promote the formation of advantages in the modern science and technology service industry, especially make good use of the advantages of the information service industry base, and promote the development and growth of the software and information service industry.

2) Form a good atmosphere for innovation and development

The first is to strengthen public opinion propaganda and enhance the atmosphere of popular science. Strengthen the construction of innovation culture in the whole society, and form a good social environment in which all sectors of society value science and technology and advocate innovation. The second is to formulate an action plan to promote the work. The third is to strengthen the main position and cultivate the sense of enterprise innovation. Enterprises are actively encouraged to participate in the discussion and decision-making of major matters concerning the construction of a famous science and technology city, and the competent departments of science and technology should often go deep into high-tech enterprises, strategic emerging enterprises, and traditional enterprises through face-to-face exchanges.

3) Create a favorable ecology with tilted policies

The first is to enhance the attractiveness of policies, take the initiative to study the advantages of innovation-driven

development policies in surrounding advanced areas, and further improve the policy incentive system according to the actual conditions of Tai'an City. The second is to improve the pertinence of policies, formulate and improve special support policies for small and medium-sized enterprises and special support policies for characteristic industries, form systematic industrial development guidance policies, and tilt policies towards strategic emerging industries. The third is to improve the awareness rate of policies. Actively carry out science and technology policy publicity activities, give full play to the role of scientific and technological assistants in townships, streets, and parks, and go deep into enterprises to carry out zero-distance services. [6] presented an innovative visual aid framework for completely blind people, which takes the form of a pair of glasses. The following are some of the most essential characteristics of the proposed device. The complicated algorithm processing is carried out on the Raspberry Pi 3 Model B+, which has low-end computing power. Using a combination of camera and ultrasound sensors and GPS-based location tracking for use in a navigation system, this Internet of things-based device offers advanced dual detection and distance measurement capabilities. This device makes it possible to have better access, solace, and navigational ease to blind people. [7] discussed that Smart wearables are redefining the way people move and behave in real-time. Workers will be alerted to the presence of toxic gases as well as be tracked in the event of an accident if this system is implemented. Additionally, the instrument has sensors for methane and carbon monoxide gases included in its design. The prototype can detect gas in the air, the rate of the miner's breathing, the change in temperature and humidity, and the miner's location at all times. Wi-Fi will be used to transmit all of these parameters to a dynamic internet protocol. Every one of them will be able to make it through the shield. This way, all mineworkers can be monitored, and if something goes wrong, the miner can be rescued as quickly as possible. Using a pulse sensor on the miner's body, the base camp can track the miner's GPS location. It may be necessary to dig a coal mine as soon as possible to save the most people in a disaster. With the help of IoT, we can build a database and, if necessary, communicate with a nearby hospital. Our final consideration will look at market trends and challenges for WHDs to keep in mind.

(2) Accelerate the improvement of industrial scientific and technological innovation capabilities

1) Strengthen the effect of industrial innovation

According to the development needs of the leading industry in Tai'an, the innovation chain is precisely deployed around the industrial chain, so that the industrial chain is embedded with scientific and technological elements and innovation factors. With the help of industry-university-research docking with universities, strengthen the development and application of key technologies and promote the transformation and upgrading of traditional

industries.

2) Cultivate an innovative industrial chain

Focus on cultivating strategic new industries with greater room for development. It is necessary to seize the opportunity of the innovation research institute to settle in Tai'an City, make use of the innovation model of innovation research institute + innovation consortium + industrial company, gather a group of powerful enterprises, and seek breakthroughs in the fields of assembly equipment and new materials.

3) Establish an industrial service chain

Coordinate the establishment of the basic database of innovation resources in Tai'an. Investigate the innovation resources of the whole region, and coordinate and integrate various innovative resources such as science and technology, talents, carriers, platforms, projects, funds, and assets that were originally scattered in various sections and regions. Establish a full-chain service system of science and technology service centers, strengthen the layout of R&D and design fields for upstream technologies, focus on the development of a number of scientific and technological services such as policy guidance, entrepreneurial guidance, R&D design, and business incubation, and improve the level of original innovation and applied basic research.

(3) Increase the construction of innovation carrier platforms

1) Highlight the characteristics of industrial agglomeration of innovation carriers

In the process of attracting science and technology complex industries, it is necessary to focus on leading industries and focus on high-quality enterprises with high scientific and technological output and large development space; High-quality scientific research institutions with strong scientific research ability and high academic level; Professional service institutions with high professional quality and strong service ability carry out targeted industrial chain attraction, forming a virtuous circle of "carrier gathering industry, industrial rejuvenation carrier".

2) Accelerate the quality improvement of the scientific and technological innovation carrier platform

Pay close attention to improving the quality of the enterprises settled in the complex. High-quality enterprises have good radiation benefits, and the attraction of a high-quality leading enterprise can drive the agglomeration of a group of enterprises, thereby driving the development of the entire industry. It is necessary to focus on innovating the mode of complex management and operation. Learn from the successful experience of high-quality complex operation in developed areas, combine local successful cases, and vigorously introduce professional operation institutions for socialized and professional management and operation.

3) Accelerate the quality improvement of carrier platform supporting facilities

Efforts should be made to strengthen infrastructure construction such as life, entertainment, culture, and fitness.

It is necessary to closely follow the needs of young talents such as scientific and technological innovation for learning, life, innovation and entrepreneurship, and synchronize planning and rationally layout urban parks, talent apartments, residential areas, schools and hospitals and other living facilities around the science and technology industry complex. It is necessary to improve the construction of soft facilities such as innovative financial service systems. Give full play to the leverage of fiscal funds, and increase the proportion of investment in scientific and technological research and development in the region's public budget.

(4) Strengthen efforts to create a highland of innovative talents

1) Strengthen the attraction of industrial talents

It is necessary to highlight the pertinence of talent attraction, build industrial clusters, develop strategic emerging industries, high-end service industries and modern agriculture, and introduce professional talents to promote industrial development. It is necessary to pay attention to the comprehensiveness of talent recruitment. Based on the actual development of the industry, take into account the needs of all kinds of talents.

2) Improve talent service policies

According to the actual situation of the whole region, on the basis of the provincial talent policy, a talent science and technology policy with the characteristics of Tai'an City was tailored. These include the establishment of industrial funds, the introduction of top talents at home and abroad to lead major projects, the introduction of major innovation platforms, and the organization of scientific and technological talents to train overseas, etc., and tailor-made policies for special talents and special projects.

3) Stimulate the endogenous motivation of talents

It is necessary to build a talent career platform. Accelerate the introduction of various innovation carriers, key laboratories and other platforms. It is necessary to strengthen the work of training and improving talent. Implement the spirit of the relevant documents of the central government, provinces and municipalities to support entrepreneurs' entrepreneurship, comprehensively create a good atmosphere of respecting business and valuing enterprises, and let entrepreneurs have more sense of gain. It is necessary to create a good atmosphere of respect for talents. Strengthen the selection of typical trees for key talents, strengthen typical guidance, and let latecomers have examples and learn from examples.

## V. CONCLUSION

Modern urban construction is a diversified ecosystem, which is affected by multiple factors such as natural resource endowment, regional geographical location, scientific and technological innovation ability, human talent resources, and social and cultural atmosphere. Under the emerging wave of technological globalization, innovation-driven development has gradually become a consensus. This paper proposes to

build an industrial cluster with strong driving force, form a good atmosphere for innovation and development, and create a favorable ecology with tilted policies, so as to step up the formation of innovation agglomeration advantages; By strengthening the effect of industrial innovation, cultivating innovative industrial chains, and establishing industrial service chains, we will accelerate the improvement of industrial scientific and technological innovation capabilities; By highlighting the characteristics of innovation carrier industry agglomeration, accelerating the quality improvement of scientific and technological innovation carrier platforms, and accelerating the improvement of supporting facilities of the carrier platforms, we will increase the construction of innovation carrier platforms; By strengthening the attraction of industrial talents, improving talent service policies, and stimulating the endogenous motivation of talents, we will create a place for innovative talents. It will provide decision-making reference for Tai'an to better promote the construction of a scientific and technological innovation city in the future, and make a modest contribution to serving the construction of a famous scientific and technological innovation city.

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