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Mini-review on the Evaluation Index System of University Science and Technology Parks in China

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Abstract

With the development of China's economy, science, and technology play an increasingly important role, and the national and local governments attach more importance to the development of science and technology and have increased their investment in scientific research and technological innovation, especially in the construction of university science and technology parks. Such park is a platform for the integration of production, learning and research, which can effectively transform the scientific and technological achievements of universities into high-tech enterprises or other effective forms of flow to enterprises through incubation. In the process of construction and development of the park, it is necessary to apply certain scientific methods to make a comprehensive evaluation of it, i.e., to establish an evaluation index system to determine the problems existing in the process of its development. In the new situation, the problems of the original evaluation index system are exposed, such as the unreasonable distribution of the weights of secondary index and too many tertiary indexes. Therefore, it is necessary to improve the original evaluation index system. The main objective of this paper is to analyse the scientific evaluation index system that has been established to evaluate the implementation of the functions of university science and technology parks and their own operations in order to determine the comprehensive development status of university science and technology parks. This review serves as a guide for the healthy, rapid and sustainable development of university science and technology parks in China.

Keywords

University Science and Technology Parks; Evaluation Index; Index System.

1. Introduction

1.1. Definition of University Science and Technology Parks in China

Since the success of the world's first university science and technology park (Stanford University Research Park), countries and regions around the world have invested great enthusiasm in the establishment of high technology parks and followed suit, such as the famous Cambridge Science Park established in 1975 in the UK, the construction of the Sophia Antis Science City in France in 1969, and the Tsukuba Science City project in Japan since the late 1960s [1]. By 2007, there were 62 national university science and technology parks in China, including Tsinghua University Science Park, Fudan University Science Park and Sichuan University Science Park, in three batches. In general, these university science and technology parks have played an important role in incubating high-tech enterprises, transforming scientific and technological achievements of universities, training innovative and entrepreneurial talents, promoting the development of high-tech industries, accelerating regional economic construction and technological progress of industries, as well as relieving employment pressure, and are a booster for structural adjustment and a growth point for economic

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development [2]. At present, there is no unified definition of university science and technology parks, and the main ones are as follows.

According to the general principles of the *Trial Measures for the Management of National University Science and Technology Park* jointly formulated by the Ministry of Science and Technology and the Ministry of Education. Whereas the definition in Chapter 2 of the *General Principles of the National University Science and Technology Park* jointly formulated by the Ministry of Science and Technology and the Ministry of Education, a university science and technology park is an institution that combines the comprehensive intellectual advantages of a university [3], such as talents, technology, information, laboratory equipment and library materials, with the advantages of other social resources to provide services for technological innovation and transformation of achievements, relying on a research university or a university cluster.

In the *Second National Conference on University Science and Technology Parks* held in 2003, the Ministry of Science and Technology and the Ministry of Education is defined university science and technology parks as "an important part of the national innovation system and a major source of innovation for regional economic development and industrial technological progress [3]. It is one of the main sources of innovation for regional economic development and technological progress in the industry, an important platform for realising the social service function of first-class universities and the integration of industry-university-research, and a major It is an important platform for realizing the social service function and the integration of industry-university-research of first-class universities and one of the important symbols of first-class universities."

Looking back into the *National University Science and Technology Park's Tenth Five-Year Plan*, the university science and technology park is based on a research university or a group of universities, taking advantage of the university's comprehensive resources such as talents, technology, information, laboratory equipment and cultural atmosphere, and through diversified investment channels including venture capital, and with the guidance and support of government policies, a university science and technology park is established in the vicinity of a university. Under the guidance and support of government policies, high-tech parks are established in the vicinity of universities to engage in technological innovation and business incubation activities [4]. It is a base for technological innovation, a base for high-tech enterprise incubation, a base for the gathering and cultivation of innovative and entrepreneurial talents, and a base for the radiation of high-tech industries.

Moreover, the university science and technology parks are an important part of the national innovation system and an important base for independent innovation, one of the main sources of innovation for regional economic development and technological progress of industries as well as the second venture of high-tech zones. It is also an important platform for higher education institutions to combine industry, university, and research, serve the society and cultivate innovative and entrepreneurial talents [5]. A first-class national university science and technology park is one of the important signs of a first-class university.

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Among the above four definitions of university science and technology parks, the first and fourth definitions are basically similar, while the third definition better reflects the essence of university science and technology parks, which is more specific than the other definitions and points out several basic functions of university science and technology parks: technology innovation, business incubation, talent cultivation, and industrial radiation. This paper argues that a university science and technology park is a base for technological innovation, business incubation, talent training and industrial radiation set up jointly by the government, universities, and social entities [6].

1.2. Features of University Science and Technology Parks

After more than a decade of development, the university science and technology park continue to reflect new features at this stage with the following features.

- **Openness**

The university's key laboratories and engineering centres are fully open to the university science and technology park, and the openness is promoted through certain management methods, which is a valuable resource for the University Science and Technology Park and is not available in other incubators.

- **Diversity**

University science and technology parks in various countries have, to varying degrees, the characteristics of diversity. One is the diversification of the main body of investment, including both the university's own capital investment, but also including the state, venture capital, enterprise capital injection. This enables the full use of various social funds to accelerate the construction of the park; secondly, the diversification of service targets, both for university teachers and students to provide support for entrepreneurship, but also for entrepreneurs from the community, from abroad to provide services Thirdly, the diversification of the investment body of the enterprises cultivated, the enterprises cultivated by the university science and technology park to operate in accordance with the modern enterprise system [7].

- **Intelligent and ultra-highly dense**

The University Science and Technology Park consists of several universities, comprehensive technical colleges, and research institutes. High-level research and development institutions in multiple disciplines form a three-dimensional synergy of research and development, engaging in basic and developmental research in multiple fields, giving full play to the advantages of ultra-high density of intelligence and enabling frontier development to expand [2].

- **Trend of internationalisation**

Multinational companies hold most of the world's production technology, with its strong capital investment, with many countries to establish scientific parks in universities and research institutions, directed to develop cutting-edge technology.

- **Establishment of information networks**

The development of information technology has promoted the construction of a global information network, which has created a new driving force for the development of high-tech research.

- **Research and development of science and technology goes hand in hand with the training of human resources**

The University of Montreal Science Park in Quebec, Canada, on the one hand undertakes cutting-edge scientific research in biotechnology and genetic engineering, and at the same time, undertakes the task of training master's and doctoral students and university researchers in these fields. 15,000 graduates are produced each year who master new technologies and enter high-tech enterprises in Montreal, becoming the most active productive force there [8].

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1.3. Roles of University Science and Technology Parks

The establishment and development of university science and technology parks plays a positive role in giving full play to the comprehensive advantages of university intellectual resources, accelerating the process of transforming university high-tech achievements into productivity, exploring effective ways to combine university teaching, scientific research, and industry, and promoting the reform and development of national and local high-tech development zones. Specifically, it is manifested in the following aspects.

- **Playing a role in accelerating incubation for the development of high-tech industries**

The university science and technology park is the development base of high-tech, radiation source, the incubator of new enterprises, its development, for the development of high-tech in China opened up a new effective way, its pioneering, for the school research oriented socialist economic construction opened up a broad prospect, will certainly have an increasing impact on China's economic development. Universities are important creators and owners of high technology, and there is potential to develop the results of high technology into products and industries. In the past, due to restricted conditions, the potential advantages did not fully turn into market and industrial advantages. With the environmental conditions and support service system provided by the university science and technology park, as well as the operational mechanism established [9]. This stage can be provided for scientific and technological personnel to develop high-tech achievements and incubate high-tech enterprises, which greatly accelerates the incubation of high-tech enterprises.

- **Play a practical foundation role in cultivating innovative talents**

Universities are the main channel for cultivating senior professionals with innovative spirit and practical ability. Cultivating innovative talents requires not only solid basic knowledge, but also rich practical knowledge. Under the socialist market economy system, society urgently needs more complex talents, entrepreneurs, economic experts and senior management experts. For enterprises, the university science and technology park are a good by fertile ground for cultivating a new generation of entrepreneurs and a base for enterprises to cultivate high-tech talents by making use of the strong intellectual advantages of universities. For higher education institutions, it is a base for combining education with scientific research and production, and a base for educating people. The university can make use of its scientific research and production conditions and its extensive connection with society to reasonably arrange students' practice and internship, so as to closely link the cultivation of talents with socialist construction [10].

- **University Science and Technology Park helps to expand the field of international cooperation and strengthen the ability of international competition**

Regardless of the specificities of a country or region, university science and technology parks play two major roles: firstly, to improve the region's ability to compete internationally in terms of science and technology, economy, and social development. The second is to strengthen the region's ability to cooperate internationally with other countries and regions in terms of technology, finance, and management. As the trend towards world economic integration continues to become clearer, the role of university science and technology parks will become more and more fully visible.

2. International Research Theories on Science and Technology Parks

2.1. Industrial Cluster Theory

Industrial clustering theory originated in 1950 and refers to a group of companies in the same or related industries, gathered in a specific area to drive each other and promote common development. They argue that clusters of high-technology companies are the key to the

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development of high-technology zones, and they believe that, for one thing, clusters of high-technology companies can help to improve the survival rate of small and medium-sized enterprises and new high-technology companies joining the clusters. The main reason for this is that the proximity of research institutions can provide a source of technology and excellent high-tech talent and can help to expand relationships with upstream suppliers and downstream consumers, as well as build networks of cooperation with neighbouring companies [1]. Secondly, clusters of high-technology industries create mutual support between high-technology companies and research and academic institutions. Thirdly, high-tech industry clusters enable high-tech firms to establish production and technological collaborations, and through geographical proximity, high-tech firms can strengthen their collaboration and shorten the time to new products or technological innovation. The formation of the theory of spatial clustering of high-tech industries has played an important role in guiding the rapid development and growth of high-tech zones in various countries.

2.2. Spatial Diffusion Theory

The earliest person to conduct pioneering research on the phenomenon of diffusion and lay the foundation of spatial diffusion theory is Professor T. Hagerstrand of Lund University in Sweden, who is regarded as the master of the fourth generation of location theory. Since then, many British and American locationalists have studied it in depth. Diffusionists believe that high-technology zones play a pivotal role in the formation of high-technology industries and in promoting the diffusion and penetration of high-technology into traditional industries [4]. It takes the high-tech system as the source of diffusion, and through diffusion, the high-tech gradually replaces the core technology of the original industry, thus forming a new industry with high-tech as the core technology, while the original industry is transformed or reconstructed, and eventually forms a new high-tech industry by interacting with high-tech. Different industries have different abilities and situations to absorb foreign technology, but they all form the innovation process of industrial technology, division of labour, organisation and management, and product compounding.

2.3. Innovation Theory

This includes the theory of regional creativity, the theory of entrepreneurial capabilities and the theory of technological innovation. The concept of innovation was first developed by Austrian economist J. Schumpeter. He argued that innovation is the recombination of factors of production and that the entrepreneur is the key to the creation of new products and services. Bearbitt's theory has been developed so that there is a difference between technological innovation and institutional innovation. Innovation is the soul of high-tech zone development, which has become a generally accepted view. The American scholar Anderson (1985) suggested that creativity as a social phenomenon initially developed in highly competitive regions with good internal and external communication networks. He argued that these conditions could be created through public policy, including the creation of science and technology parks. Regional creativity is also linked to city size, with the idea that larger cities can offer more services and larger agglomeration economies [5].

Another scholar who has studied technological innovation, diffusion and industrial development is Professor R. Vemon of Harvard University. He proposed the product life cycle theory, which summarises the development process of high-technology products into three stages: "new product", "maturity" and "standardisation". Other scholars have also divided the impact of new technology on the industry into five stages: zero profit, excess profit, average profit, decreasing average profit and occasional decreasing profit (introduction of small technological revolutions), and negative profit [11].

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2.4. Triadic Participation Theory

Since the 1970s, many new problems have emerged among the government, universities and enterprises, which have proved to be impossible to solve unilaterally, hence the idea of the "triadic participation theory". At the 9th World Congress of the International Association of Scientific Industrial Parks (ISIP), the "triadic theory of participation" was officially presented, involving research institutions, business and government. The basic idea is that the government acts as a coordinator; the universities receive funding from the enterprises to reduce the financial burden of the government and increase the rate of transformation of scientific and technological achievements; and the enterprises cooperate with the research institutions to develop high technology in order to increase tax revenues and develop the regional economy [12]. Research institutions (mainly universities) act as a source of technology and talent; enterprises act as a source of funding and market development; the government provides policy and infrastructure support, and the three parties coordinate the joint development of high-tech industries through science and technology parks on the basis of common interests to promote the development of the regional economy. The theory has become the theoretical basis for the development of universities.

Countries around the world are investing more in the construction of science and technology parks. An article recently read by the author of this article indicated that the Thai government would establish a number of new science and technology parks to form the Northern University Science and Technology Park and the Southern University Science and Technology Park. The United States, Europe and Japan have also indicated that they will invest more in the construction of science and technology parks [13].

3. China’s Research Theories on Science and Technology Parks

The development of science and technology parks has also been extensively explored by Chinese academics, and certain results have been achieved, as follows.

Bai Keming (1993), after studying the development models of science and technology parks at home and abroad, divided them into three types: (l) dominant dominant model: (2) dominant import model: (3) dominant integrated development model. According to Zhu Minghong and Yang Ru (1996), there are three models for the development of science and technology parks in China: high-tech product development zones, high-tech industrial development zones and high-tech multi-functional development zones [1,12].

Li Lianshui (1999) argues that, in the period of promoting the transition from an industrial economy to a knowledge-based economy, further clarifying the types of construction of science and technology parks and accurately positioning their functions will be conducive to the formation of an overall advantage in China that is distinctive and mutually supportive, to the better development of each science and technology park as a new economic region for the growth and development of a knowledge-based economy, and to its role in driving the upgrading of the national industrial structure and improving China's comprehensive national power. It is also conducive to the role of science and technology parks in driving the upgrading of the national industrial structure and improving China's comprehensive national power [13]. At the same time, several types of construction have been proposed, such as long-term strategic positioning type, new city construction linkage type, industry selection focus type, and supporting regional development type.

According to Mou Mainzhu (1999), (l) science parks established in existing intellectually dense areas should choose the science park model; (2) science parks established in science and technology and industrial bases with good infrastructure conditions and national key development should choose the science city model; (3) parks established in locations with strong industrial bases and large enterprises should choose the technology city model; (4)

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parks established in large and medium-sized cities with a more developed externally-oriented economy, many external links and convenient (4) for parks established in large and medium-sized cities with a more developed externally-oriented economy and many convenient external links, the high-tech processing zone model is adopted: (5) for a large space where several science and technology parks are clustered, the high-tech zone model is chosen [5].

Cheng Maoji (1999) summarised the characteristics of the formation of high-tech zones in foreign countries: (l) the spontaneous development model is the main one, basically relying on the role of the market mechanism; (2) based on famous universities or national key laboratories or scientific research institutions, based on the "spillover effect" of highly active universities and scientific research institutions and (3) the concentration of innovative resources such as capital, talents, technology and information, which is an important basic condition to ensure the formation of high-tech zones; (4) the support of strong economic power and strong military industrial demand are the macro-driving factors that enable the formation of high-tech zones in a short period of time; (5) the existence of fast and convenient internal and external transportation systems, etc.; he compared the conditions for the formation of famous high-tech zones with those of several foreign dogs. After comparing the conditions for the formation of famous high-tech zones, he defines China's high-tech industrial zone as "a large and medium-sized city or urban contiguous area with a certain degree of scientific and technological economic strength as the backbone, with many types of development zones aiming at accelerating technological innovation and introducing advanced technology and thus achieving the common goal of promoting the development of high-tech industries, in close geographical proximity to each other and through They are connected to each other by a certain level of rapid transportation and communication axis system, and there are close economic, technological, human and information exchanges and links (e.g. subcontracting, derivative relationships) in the process of technological innovation and diffusion, high-tech industrialisation and internationalisation [14]. In addition, Guo Hong, Jin Ruiling and Yu Zongbin use probabilistic selection models to study the formation mechanism of high-tech zones from the perspective of the occurrence of high-tech industries. They argue that the formation of high-tech zones is essentially a process of selection by a number of high-tech enterprises through the neighbourhood effect, which results in the formation of a certain equilibrium.

4. China’s Research Theories on Science and Technology Parks

4.1. Analysis of the Existing Evaluation Index System

Although the national university science and technology park assessment and acceptance index table covers the main elements of university science and technology park development in terms of content, the structure of the table appears to be rather fragmented, and the selection of index at all levels is not very reasonable.

- **No clear basis for dividing the index system**

In the national university science and technology park assessment and acceptance index table, we cannot clearly say what is the basis for the division of its first-level index. If we want to divide it by function, we need to establish at least one level of index from several aspects, such as technological innovation, business incubation, gathering and cultivation of innovative and entrepreneurial talents [7]. If we think that the national university science and technology park assessment and acceptance criteria table of incubation capacity and technology innovation capacity and construction results of the two barely correspond to the two functions of the university science and technology park, the function of talent gathering and cultivation is divided into the secondary index, resulting in unclear structure.

- **Structure of the index system is confusing**

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For example, in terms of environmental construction, local government policies are indeed an aspect of environmental construction, but the implementation of local government support policies does not depend on the university science and technology park, so it is inappropriate to examine the innovation capability, which is one of the important functions of the university science and technology park but is placed in the secondary index [14].

- **Cross-cutting index**

The crossover between index means that they affect each other and are highly correlated. For example, environmental development is related to incubation capacity, and it is almost certain that the better the environmental development, the stronger the incubation capacity (for example, the size of land and infrastructure affects the number of enterprises and personnel, so the two are positively correlated). In fact, it is impossible to build a system of evaluation index without creating index correlations. Tier 1 index are based on a different level at which this positive correlation is strong. This will undoubtedly affect the accuracy of the evaluation results. In contrast, the correlations arising from index at the same level are often not as strong.

- **Secondary index are not specific enough**

There are too few indexes in terms of innovation capacity (only in terms of patent applications and projects undertaken), which do not reflect the innovation capacity of the university science and technology park in detail.

- **Unreasonable weighting**

In terms of weighting, the weighting of technological innovation is too low and does not reflect the functional positioning of the university science and technology park, while the weighting of environmental construction is as high as 35%. The setting of the index system reflects the subjective tendency of the index system setter to a certain extent, which will produce a certain orientation to each science and technology park in the actual evaluation application. The evaluation system has some details [15].

There are also some details of the evaluation system, such as the shareholding of the supporting company in the science and technology park company, which, although qualitative analysis is used, does not tell us much about the evaluation index system.

Bai Keming (1993), after studying the development models of science and technology parks at home and abroad, divided them into three types: (l) dominant dominant model: (2) dominant import model: (3) dominant integrated development model. According to Zhu Minghong and Yang Ru (1996), there are three models for the development of science and technology parks in China: high-tech product development zones, high-tech industrial development zones and high-tech multi-functional development zones.

4.2. Improvements to the Existing Evaluation Index System

Chinese academic researchers have improved the evaluation index system of university science and technology parks, with the study by Professors Xu Xiaoqin and Wang Yongning of Chongqing University being the most representative. This index system evaluates the university science and technology parks according to their six functional positions of supply source, incubation, incubation radiation, aggregation and feedback, in five aspects: the research level of the university they are based on, the entrepreneurial environment of the university science and technology park, the incubation capacity of the university science and technology park, the technological innovation capacity and the construction results as indicated in Table 1.

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Table 1. Table of improved university science and technology park evaluation index

Tier 1 index	Weighting	Tier 2 index	Weighting
Rely on the University Level of scientific research	0.24	National and research and development base information	0.16
		Vertical research projects and funding	0.18
		Awarded scientific research achievements at or above provincial or ministerial level	0.18
		Patents granted	0.18
		Faculty on campus	0.16
		Postgraduate students in school	0.14
Incubation capacity	0.30	Number of incubatees	0.24
		Number of graduated companies	0.24
		Proportion of high-tech enterprises among incubatees	0.12
		Total incubation area developed	0.12
		Average incubation area of companies in incubation	0.10
		Shareholding in the Science Park	0.09
		Number of skilled personnel provided to the Science Park by the relying units	0.09
Entrepreneurial environment	0.16	Local government support policies, measures and implementation	0.2
		Support policies, measures and implementation of the relying unit	0.16
		The opening up of the university's talents, facilities, library and other resources to the Science Park	0.08
		Technology Park Management Mechanism and Governing Body	0.10
		Availability of land, communication, transportation, property and other infrastructure provided by the Science Park	0.12
		Establishment and services of intermediary service providers	0.12
		Establishment of venture capital, seed money	0.24
Technological innovation capabilities	0.16	R&D expenditure as a percentage of sales revenue	0.25
		R&D staff as a percentage of total employees	0.11
		Proportion of senior and middle-ranking staff to total staff	0.12
		No. of in-house innovative products and patents	0.20

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		Number of innovative products approved by incubatees	0.18
		Number of various R&D institutions in the Park	0.14
Construction results	0.14	Average growth rate of sales revenue of incubatees in the past three years	0.31
		Average growth rate of sales revenue of graduating companies in the last three years	0.27
		Sales revenue per unit area of incubated enterprises	0.17
		Number of training practitioners in the last three years	0.13
		Number of students attracted to study abroad to start their own business in the last three years	0.12

5. Future Improvement in the Evaluation Index System

Through the analysis of the characteristics and roles of science and technology parks and related theoretical literature, and considering the principles of selecting indicators for the evaluation index system of university science and technology parks, the evaluation index system of university science and technology parks in this paper is divided into the following five indicators: the entrepreneurial mentor support capacity of university science and technology parks, the technological innovation capacity of university science and technology parks, the incubation capacity of university science and technology parks, the technology transfer function, and the support service system of university science and technology parks.

5.1. Entrepreneurial Mentorship Support Capacity of University Science and Technology Parks

Since the Hangzhou Municipal Government proposed to establish a mentorship system for university students in university science and technology parks in 2006, university science and technology parks across the country have studied the mentorship system and have become deeply aware of the great significance of the mentorship system. The entrepreneurial mentorship system for university students refers to the hiring of relevant experts to provide targeted guidance during the entrepreneurial stage process in order to enable university students to successfully start their own businesses, according to the characteristics of the stages of their entrepreneurial process. The main task of entrepreneurial mentors is to guide university students to establish entrepreneurial concepts, carry out entrepreneurial training, guide entrepreneurial practice and provide them with entrepreneurial services [12]. Entrepreneurship is supposed to be a process of moving forward in the process of figuring out what to do. If there is an excellent entrepreneurial mentor to guide a small business one-on-one, provide it with scientific management and long-term development planning, and provide it with financial and legal services at critical moments of the small business. Relevant information shows that the entrepreneurial mentorship system can greatly improve the success rate of start-ups in the Science and Technology Park. According to information from the National Science and Technology Park of Hefei University, the success rate of enterprises incubated in the University Science and Technology Park is around 50%, and according to statistics from the relevant authorities in Hangzhou, the success rate of enterprises incubated after the implementation of the mentorship system is as high as over 90%. The mentorship support capacity of university science and technology parks should be assessed in three aspects:

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the number of mentors, the average number of mentors in the enterprises, and the proportion of shares of mentors in the supported enterprises.

5.2. Technological Innovation Capacity of the University Science and Technology Park

From a macro perspective, innovation should include two major parts: knowledge innovation or scientific innovation and technological innovation. Universities and scientific research units are the main body of knowledge innovation, and enterprises in university science and technology parks are the main body of technological innovation. The paper argues that the scientific research level of universities and the technological innovation of university science and technology parks are both factors of the technological innovation capacity of university science and technology parks [11]. As a technological innovation base, the technological innovation capacity of the university science and technology park lies not only in the research level of the university it relies on, but also in the technological development institutions, personnel and financial investment in the university science and technology park itself.

5.3. The Support Service System of the University Science and Technology Park

An important way for university science and technology parks to realise their functions and industrialise their technological achievements is to incubate enterprises in university science and technology parks, but good technological achievements alone are not enough. This paper considers that the support service system of the university science and technology park includes two aspects: infrastructure and technology intermediary services [13].

5.4. Technology Transfer Function

The national innovation system includes many aspects, not only the formulation of science and technology development strategies, but also the introduction of corresponding policies and regulations. In addition to improving the knowledge innovation capacity of universities and research institutions and the technological innovation capacity of enterprises, an important aspect is to strive for effective technology transfer. Technology transfer in university science and technology parks includes the discovery and cultivation of research results, the introduction and adaptation of mature technologies, the promotion of technology projects and the transfer and guidance of technology projects. The Science and Technology Park, as the main body of technology transfer, is involved in almost all aspects of technology transfer [14].

5.5. Incubation Capacity of the University Science and Technology Park

As one of the main functions of the university science and technology park, the incubation capacity of the park has an important role in the development of the park. The incubation capacity of the park is directly related to whether the University, especially the comprehensive and research universities, which is a "reservoir" of huge knowledge achievements and professional talents, can release its enormous energy. Therefore, we regard incubation capacity as an important factor in examining the development capacity of science and technology parks themselves.

References

[1] Hobbs, Link, A. N., & Scott, J. T. (2017). The growth of US science and technology parks: Does proximity to a university matter? The Annals of Regional Science, 59(2), 495–511. https:// doi. org/ 10. 1007/s00168-017-0842-5.

[2] Link. (2019). University Science and Technology Parks: A U.S. Perspective. In Science and Technology Parks and Regional Economic Development (pp. 25–38). Springer International Publishing. https://doi.org/10.1007/978-3-030-30963-3_3.

ISSN: 2688-8653

[3] Amoroso, Link, A. N., & Wright, M. (2019). Science and Technology Parks and Regional Economic Development [electronic resource] : An International Perspective / edited by Sara Amoroso, Albert N. Link, Mike Wright. (1st ed. 2019.). Springer International Publishing. https:// doi. org/ 10. 1007/ 978-3-030-30963-3.

[4] Xie, Wang, L., Li, J., Li, R., & Chen, X.-Q. (2020). General principles to high-throughput constructing two-dimensional carbon allotropesProject supported by the National Science Fund for Distinguished Young Scholars, China (Grant No. 51725103) and the National Natural Science Foundation of China (Grant No. 51671193). All calculations have been performed on the high-performance computational cluster in the Shenyang National University Science and Technology Park. Chinese Physics B, 29(3). https://doi.org/10.1088/1674-1056/ab6c4b.

[5] Albahari, Pérez-Canto, S., Barge-Gil, A., & Modrego, A. (2017). Technology Parks versus Science Parks: Does the university make the difference? Technological Forecasting & Social Change, 116, 13–28. https://doi.org/10.1016/j.techfore.2016.11.012.

[6] Amoroso, Link, A. N., & Wright, M. (2019). Science and Technology Parks and Regional Economic Development: An International Perspective. Springer International Publishing AG.

[7] Theeranattapong, Pickernell, D., & Simms, C. (2021). Systematic literature review paper: the regional innovation system-university-science park nexus. The Journal of Technology Transfer, 46 (6), 2017–2050. https://doi.org/10.1007/s10961-020-09837-y.

[8] Studies from Y. Liu et al Have Provided New Data on Oxidation Technology (Study on the cultivation of innovative talents in Universities Based on National University Science and Technology Park). (2018). In Journal of Engineering (p. 1754–). NewsRX LLC.

[9] Parry. (2020). Science and Technology Parks and Universities – Facing the Next Industrial Revolution. In Higher Education in the Arab World (pp. 109–140). Springer International Publishing. https://doi.org/10.1007/978-3-030-37834-9_5.

[10] Cao. (2003). Zhongguancun aspiring to become “China’s silicon valley” / Cao Cong. East Asian Institute, National University of Singapore.

[11] M.H. Feng. and K.Y. He: National Blue Books of Cultural Industries (Social Sciences Academic Press, China 2015).

[12] R. Fletcher. and R.K. Nielsen. Are News Audiences Increasingly Fragmented? A Cross-National Comparative Analysis of Cross-Platform News Audience Fragmentation and Duplication. Journal of Communication, Vol.67 (2017) No.4, p.476–498.

[13] S. Xia. A study on the profit model of we media in China. Global Media Journal,Vol.15 (2017) No.28, p.1-8.

[14] Farré-Perdiguer, Sala-Rios, M., & Torres-Solé, T. (2016). Network analysis for the study of technological collaboration in spaces for innovation. Science and technology parks and their relationship with the university. International Journal of Educational Technology in Higher Education, 13(1), 1–12. https://doi.org/10.1186/s41239-016-0012-3.

[15] McAdam, & McAdam, R. (2008). High tech start-ups in University Science Park incubators: The relationship between the start-up’s lifecycle progression and use of the incubator’s resources. Technovation, 28(5), 277–290. https://doi.org/10.1016/j.technovation.2007.07.012.