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**NANJING UNIVERSITY OF INFORMATION SCIENCE AND TECHNOLOGY**
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# Title: Imitation Innovation Strategy, Case Study: "the Trinity" Synergy Innovation Mechanism

**COURSE: Management of technology and innovation**

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# Summary :

# Abstract

The progress of science and technology and the development of innovation activities are the important impetus for the rapid development of China's economy. Due to the low level of technology, insufficient funds and scarce resources of scientific and technological innovation, China's innovation strategy tends to imitate technological innovation. For developing countries, this model of imitation and innovation has indeed played an important role in improving a country's technological conditions and laid a technological foundation for catching up with developed countries. First, this paper defines the concept of imitation innovation, analyzes the relationship between the imitation innovation and independent innovation, the issue between imitation innovation and intellectual property, the influence factors of imitation innovation; secondly, the influence of imitation innovation on enterprise innovation performance is summarized. Finally, the future research of imitation innovation is prospected.

# 1. Introduction

With the development of economic globalization and the Internet, the earth is connected as a whole, and the speed and ability of knowledge generation and transmission have changed. It has created opportunities and conditions for countries to learn and imitate advanced technologies of other countries, and enterprises in developing countries can get late-development advantages by imitating and innovating on the basis of predecessors. Imitation innovation strategy in the 1990's gradually had an important effect on the development of China's enterprises, such as Tencent, its first product OICQ was an imitation of the United States launched ICQ, but Tencent wasn't completely copy, it selected the imitation innovation strategy, got rid of the stale and brought forth the fresh innovation, formed its own characteristics. The copycat innovation strategy explains why Tencent has grown so far, while the first American company to launch ICQ has long since disappeared.

In recent years, many scholars have focused on the imitation innovation strategy, aware of its importance, studied the imitation innovation strategy, but because the definition of various scholars for the imitation innovation is different, the view about on the present stage of China which innovation strategy should be taken is different, the study of imitation innovation and enterprise performance is rare, so it is necessary to conclude the idea about imitation innovation strategy research to form a holistic view.

This paper through defining the concept of imitation innovation, analyzes the relationship between the imitation innovation and independent innovation, the problem between imitation innovation and intellectual property, and the influence factors of imitation innovation, then it can help enterprise get a comprehensive view about the most appropriate innovation strategy of the enterprise. By summarizing the influence of imitation innovation on enterprise innovation performance, this paper provides some theoretical basis for enterprises to choose innovation strategy for improving enterprise performance and realizing long-term development. On the basis of summarizing the previous literatures, this paper puts forward the future prospect of the research on imitation innovation strategy and promotes the development of China's imitation innovation strategy research.

# 2. Literature Review

## 2.1. The Definition of Imitation Innovation

Since 1978, the technological innovation ability of Chinese enterprises has been improved, the performance of technological innovation improved significantly, and has emerged a large number of outstanding enterprises who have technical innovation ability, good economic benefit and competitive advantages in the domestic and international market. There are two main sources of innovation technology: internal research and development or independent innovation. Technology is derived from the enterprises' internal technical breakthrough, emphasize on its own strength, through independent research and development activities, its essence is firmly grasping the initiative and ownership of the core link of innovation. Second, external introduction, that is, technology introduction. If developing countries through their own independent research and development for the technology, the costs will much higher than the introduction of other ready-made similar technology. Technological innovation divides innovation modes into three types: independent innovation, imitation innovation and cooperative innovation. The meaning of independent innovation is to complete the whole process of technological innovation mainly by relying on the strength of the enterprise itself. Cooperative innovation refers to the joint efforts of different enterprises and actors for a certain technological innovation.

Many scholars have defined the meaning of imitation innovation, imitation innovation is defined as: the enterprise which is enticed by multiple factors, especially the fact that pioneering innovators is profitable, then they through learning, imitation, take the pioneering experience, methods of innovators and lesson, in the later period of innovation chain invest a lot of talented personnel, financial and material resources, get the competitive advantage of the respect such as quality, price and cost, gradually taking the leading innovator in the market, obtain certain economic benefits of innovation . Someone argues that imitation innovation refers to the innovators learn innovative thinking, experience and behavior, to buy or to decipher the core technology and the technical secret, to improve the technology. This behavior is on the basis of the market characteristics and trends, then further the development of innovation. The other one believed that imitation innovation is essentially an innovation behavior. "Imitation" is a further effort on the basis of others, also known as secondary innovation.

The concept of imitation innovation has been misunderstood as plagiarism, stealing other people's work and being lazy and unwilling to think for a long time. According the comprehensive definition of imitation innovation, we can find that the core of the imitation innovation is to produce new things, on the basis of predecessors' technology combined with its own actual situation and needs, to develop this enterprise's new products. Rather than completely copy, its essence is a kind of innovation behavior.

In recent years, the documents of the relevant domestic imitation innovation mainly focus on the problem between imitation innovation and intellectual property, the relationship between imitation innovation and independent innovation and the relationship between imitation innovation and enterprise performance. This paper summarizes the contents of these aspects in order to summarize the current situation of China's imitation innovation research and put forward the future prospect of the imitation innovation research.

## 2.2. Research on Imitation Innovation and Intellectual Property Rights

As to whether copycat innovation can obtain intellectual property rights, some scholars have proposed that copycat innovation may also generate independent intellectual property rights. The most typical is Japan, which, in fact, has improved its technological level to become a world economic power through imitation and innovation. China's TenCent, for example, has built its empire through imitation innovation.

Some scholars consider the protection of intellectual property rights on the relationship between the independent innovation and imitation abroad late-development countries, analyzed the late-development countries with leading technology gap and imitation ability influence on the protection of intellectual property rights system arrangement, think the intellectual property rights to restrict imitation innovation. Emulation of legitimate with the rationality of the existence, free imitation (or free competition) to protect business achievement (or creative achievements) is need to be properly balanced, the basic principle that deal with the relationship between them is that allowed by imitating competitors' products or services to compete, but not against a fair and infringes on the creative achievements of the protected, on the other hand, if reasonable use of intellectual property rights literature has the promoting effect on the imitation innovation, through the patent document retrieval, understanding of relevant technical information, tracking competitors, reduce development costs, avoid technology trade dispute , and provide the basis for a comprehensive evaluation on the imported technology, such as using the patent literature information resources, can play a role of its multiple, to enterprise's technological innovation is very important and even the survival and development.

China's patent law divides patents into three categories: invention patents, utility model patents and design. Invention patent, with high levels of innovation is the product, method or the improvement of the proposed new technical solution, often in terms of technical principle is new, most invention patent, also known as the "original". The utility model is a practical new technical scheme for the shape, structure or combination of products, and a new combination of existing technical elements. Appearance design is the product's shape, pattern, color, or its combination of rich aesthetic feeling and is suitable for industrial application of the new design, from the perspective of technology innovation is thought to be creative with the lowest, product technology did not change. After two patents would not require be substantial changes in the technical aspects, but they can also form the intellectual property rights, and the two patents in the market competition is also very meaningful, many products in the market competition are mainly in the two level.

It is generally believed that improper imitation of original innovation results will infringe others' intellectual property rights. Of existing intellectual property system in China as the way to mimic made relevant provisions: first, the technology import, the right holder has obtained assignment or licensing of intellectual property rights object of imitation. Second, through the reverse engineering way of imitation, such as starting from foreign products, product decomposition analysis and comprehensive research. Thirdly, imitation through "improving patent". Fourth, we should imitate intellectual products that are not protected by intellectual property law. Fifth, the use of intellectual property time and regional imitation. Sixth, the use of a loophole in the patent claims and the description of text to imitate, the above are just imitate, does not constitute infringement, for in the proper category imitation innovation and get results is should be protected by intellectual property rights to explain.

The current situation of Chinese enterprises is that innovation is "90% imitation, 10% breakthrough". Most enterprises follow the technical route of "reverse" decomposition and imitation innovation. Enterprises generally ignore long-term, platform and frontier technology research and development, and continue to rely on imported technology and imported parts. On this basis, such innovation is mainly derivative technology innovation on the basis of the introduction platform. Only a few enterprise groups can construct technical barriers and make breakthroughs in platform technology and frontier technology. The result of derivative innovation is patents based on utility models and designs, while the proportion of invention patents that constitute the most technical barriers is extremely low. Current our country much-needed research in intellectual property protection should be how to protect domestic enterprises' legal imitation innovation at the same time stimulate the enterprise independent innovation enthusiasm and technical barriers, improve its efficiency.

## 2.3. Research on the Relationship between Imitation Innovation and Independent Innovation

Guo believed that countries have a better understanding of their own actual development situation and needs, and the technology formed by independent innovation will be more closely linked to the actual needs of their own production. Therefore, the introduction of frontier technology is not the optimal strategy for the development of technology. Moreover, a country has completed a technological innovation can make use of its kind with no technological innovation of the technology gap between other countries for technical products in the international trade, this is because the technical advantage, to ensure that its monopoly in some products, you can get a lot of profit.

Independent innovation is the highest level of technological innovation in enterprises. In the long run, independent innovation is the strategic choice that enterprises ultimately pursue. Since the independent innovation strategy is aimed at technological lead and market lead, such a strategy will show obvious advantages in competition. First of all, independent innovation helps enterprises to build strong technical barriers for themselves. Secondly, the enterprise of independent innovation sets the goal of technology independent breakthrough and leading development as its pursuit, and seeks for a breakthrough in a brand-new technology field, with a large space for innovation. Thirdly, independent innovation is beneficial for enterprises to cultivate their r & d capability and improve the overall level of technology accumulation. Independent innovation while higher learning cost than the imitation innovation, can develop products with independent intellectual property rights, avoid most of the market profits as foreign output feedback technology.
Enterprises can achieve leapfrog development by implementing independent innovation and forming core competitiveness through continuous technological progress. Imitate innovator is a follower of advanced technology, which determines the passive adaptability, in the process of technology development is difficult to formulate technology accumulated long-term planning, difficult to consolidate and develop independent marketing channel, can only follow the change of the market. However, independent innovation requires the first place in the region to have strong economic strength, high investment in research and development, and strong ability to bear the high risk of independent innovation. Second, it has strong scientific and technological strength, advanced research and development institutions and high-level scientific and technological talents. Third, there is a sensitive information feedback system and decision-making system, and a public service organization that can fully mobilize the enthusiasm of all aspects of technological innovation. Developing countries are struggling to meet these demands.

Engel and Kleine believe that enterprises can create their own innovation through imitation. Besides r & d innovation, imitation of excellent products, processes and management systems is also an important source of innovation. Posen proposed that only when the useful knowledge and ability of the imitator were combined with the knowledge obtained from the leader company, the company would have the opportunity to successfully surpass the leader. The unity of imitation and innovation is imitation and innovation. As an innovative way, imitation innovation can also create sustainable competitive advantages for enterprises, especially for backward enterprises in developing countries. The difference between the imitation innovation and independent innovation is the different way of innovation, independent innovation model in terms of its original intention is to show the enterprise through their own efforts and exploration technology breakthrough, especially for the core technology breakthrough on its

own. Although we now place great emphasis on independent innovation, in view of the technological level of Chinese enterprises, the choice of technological innovation model should be based on technological imitation and innovation. Compared with independent innovation, imitation innovation has greater advantages. From a technical level, the imitation innovation is the first innovators in the absorption on the basis of successful experience and failure lessons, fosters strengths and circumvents weaknesses, effectively avoids risk in research and development, reduces development costs, improves the research and development success rate. From the perspective of the level of production, the imitation innovation enterprises unable to receive priority advantages in product development section, then focus on product manufacturing link, its products in quality, performance, prices are more competitive, higher economic benefits; From the perspective of the market, enterprises have stronger market foresight, which can avoid the loss caused by the silent period of the product market and reduce the cost of product publicity. When the emulation of enterprise's cost is less than the benefits, the enterprise market through constantly learning, trial and error, and will gradually adjust their innovation strategy, tend to imitation innovation, innovation market will form a dual structure, part of the enterprise will give priority to with the independent innovation, another part of the enterprise will be given priority to with imitation innovation. The benign interaction between the two can achieve the optimal allocation of innovative resources and avoid the waste of resources caused by excessive innovation in the whole society.

From the perspective of international experience, any give full play to the advantage of backwardness "technology to catch up with countries and regions, true to independent innovation to give priority to, is the overall technical level has reached the world advanced level, have very strong economic power. Of the most successful Japanese, until 1994 officially proposed "farewell to imitate and improved" era, but in the early 1980s Japan enterprise technical level has reached the advanced world level in most areas, products have strong competitiveness in the international market, to the late 1980s and early 90's, some areas of technology are in the world leading level, has no "imitation" model, national strategy was shifted from "technical state" to "science and technology to create Chinese".

Neither domestic scholars' research on China nor foreign scholars' research on developing countries can distinguish imitation innovation from independent innovation. The foreign literature basically limits the innovation of developing countries to imitation innovation, which undoubtedly denies the existence of independent innovation of developing countries. In developed countries, imitation innovation also exists, and the innovation strategy cannot be determined according to the development degree of a country. And for the same country, innovation strategies in different regions are not necessarily the same. Due to the height of the modern technology integration, making each item of the so-called independent innovation more or less there are always some imitations of ingredients in the same way, in the reality of technological innovation, there is no complete imitation. For every imitation innovation enterprise, as long as the enterprises in the process of imitation composition contains its own innovation, then no matter how big is the imitation of ingredients, which must have the enterprises "own composition". For an enterprise to grow in the process of the grasp of the relationship between independent innovation and imitation innovation, important is to grasp the enterprise growing accumulation and innovation strength changes, how to arrange the proportion of independent development in technology innovation and imitation.
For developing countries, scholars need to study when to choose to imitate innovation strategy and when to change to independent innovation strategy. China's research in this area still needs to be rich.

## 2.4. Research on Factors Influencing Imitation Ability

The influence factors of imitation innovation ability can come from enterprise internal and external analysis: on the one hand, the enterprise's own ability, strong absorption ability, technical ability, innovation ability and marketing ability, will affect the enterprise imitation innovation ability; On the other hand, external factors such as industry characteristics, economic environment and government factors are also important.

The ability of enterprises to imitate and innovate was mainly related to their rapid reaction ability, learning and absorption ability, technological improvement ability, mass production ability and marketing ability. These abilities determine how much knowledge an enterprise can acquire at what speed. Kozhikode believes that enterprises without necessary absorption capacity can only adopt blind imitation. Only enterprises with absorptive capacity can choose to innovate themselves and implement creative imitation.

In developing countries, governments play an important role in setting development goals, providing direction and providing support. Kim on the analysis of the Korean electronics industry, pointed out that the government's policy to the south Korean companies is of great success, in the process of establishing the south Korean electronics industry, the government plays a crucial role, and the government's support to help South Korea electronics company focus on product design, production capacity and imitation innovation. In addition, the corporate culture will also influence the success of imitation innovation. Although imitation innovation is also carried out, the influence of different industry characteristics on imitation innovation is very different. The cultural environment of enterprises will also influence the implementation of imitation innovation, and the innovative cultural environment is more conducive to strengthening the innovation behavior of organizations. From the aspect of organizational culture, Robert showed that organizational innovation culture has a significant positive impact on its innovation productivity. When Enrique Claver studied the influence of organizational culture on enterprise innovation ability, he pointed out that organizational innovation culture is the basis of organizational innovation behavior and innovation performance. Innovation-oriented culture is an organic combination of organizational innovation values, organizational structure, innovative behaviors and innovative thinking, with the purpose of encouraging and inspiring innovative ideas of employees. As a special way of innovation, imitation innovation also has an important influence on the cultural types of enterprises.

Existing literature mainly from the Angle of enterprise's own ability and the government, to analyze the influence of various factors on the imitation innovation, but not to analyze the influence of the size of the weight, when not all factors to the enterprise to improve its competitive advantage, independent innovation and imitation innovation enterprises how to choose? For example, when its own ability is more suitable for imitation innovation, but national policies strongly support independent innovation and set restrictions on imitation innovation, how should enterprises choose.

## 2.5. Research on the Relationship between Imitation Innovation and Enterprise Performance

Imitation innovation as a way of innovation, focus on imitating creative adaptation, on the basis of technological leapfrogging, purpose is through to adapt to the new environment, meet customer demand, thus improve enterprise innovation performance, beyond the competitors. The simple imitation, however, only hopes to survive in the huge competitive market. With the development of leading enterprises, it has no significant impact on the improvement of corporate performance.

Many researches on imitation innovation focus on its definition, pattern, type and influencing factors. There are few studies on the influence of incomplete imitation innovation on enterprise performance. The early research on the influence of imitation innovation on enterprise performance mainly comes from case study, and there are few empirical articles. Although the literature is not much, but the existing literature has shown that under the condition of environmental uncertainty, fuzzy, imitators in imitation of leader core advantage, on the basis of improvement, innovation, helps to mimic beyond leader, gain a competitive advantage, at the same time, the imitation innovation as one of the innovation modes, is the source of enterprise innovation.

The influence of imitation innovation on enterprise innovation performance can also be analyzed from the aspects of capacity building, technology improvement and brand value. From the aspects of capacity building, Kim in the auto industry, for example, through the investigation to the following technology development and innovation, found enterprise mainly as a initial imitators, imitate the technology of developed countries, replicate, improvement, and then built step by step, improve their innovation ability. Not only that, Japan's successful industrial development also benefited from the imitation innovation strategy, by absorbing the advanced technology, the introduction of product innovation to develop themselves in the face of market competition ability. Some scholars combined with China's actual situation, proposed the imitation innovation in the emerging world development paths—from the initial copy stage, to mold a stage, to the original phase. Kale and Little based on the ability to create model, research the learning process of Indian pharmaceutical industry and the rapid accumulation of technology , found that Indian pharmaceutical industry along the path repeated imitation to innovation, accelerate the technical expertise of chasing, and technical ability from imitation to advanced enterprise development laid a solid foundation for the innovation of the research and development ability, to enhance the pharmaceutical research and development of the value chain. From the perspective of technology improvement, Lee analyzed the improvement of technology capability of Taiwan's electronic industry and attributed the improvement of enterprise technology to the imitation and innovation. Ethiraj think, imitators one of methods to obtain competitive advantage is trying to develop the level of the enterprise product differentiation into vertical differentiation technology, that is, from focus on product diversity and attribute differences into focus on quality and performance differentiation, through the study of the vertical differentiation of product, is advantageous to the enterprise leader, occupy the market share, improve enterprise performance. In terms of brand value, Huang took fast retailing group as an example to analyze how uniqlo develops its value and brand image, and proposed the importance of imitation innovation. Fast retailing group continuously explore and accept from other enterprise management concept and combining with its own situation, to develop its business model by means of trial and error and create new customer value, thus promoting the improvement of the brand value. And Posen in the research of the relationship

between imitation and enterprise heterogeneity, points out that imitation is different from completely copy, it can through recombination mechanisms, on the basis of imitating target matching and mix their own practice, produce heterogeneity, thus improve enterprise performance.

Imitation innovation and business performance of Chinese enterprises this aspect of the study is less, most of existing research are focus on the whole, such as the accumulation of tangible and intangible resources, improve the management efficiency and reduce management costs, and to find opportunities to profit level, and about the performance directly linked with the enterprise operating income, operating profit seldom involved in these aspects, this aspect of the theory to be extended.

# 3. Case Study: “the Trinity” Synergy Innovation Mechanism

## 3.1. Background and Development History

The case area is in Nantong, China. Nantong is located at the north bank of the entry point of Yangzi River with Shanghai across the river; it is one of the thirteen cities in Jiangsu Province. Until the end of 2016, the income per capita of Nantong is 12,500 USD and the public revenue is 55.5 billion RMB. NITI mainly went through three phases.
The first phase was Technological Innovation and Entrepreneurship Community. In 2004, Nantong learned the innovation-driven development strategy from Suzhou, in Jiangsu, too. Nantong made a requisition of land which was next to Nantong University and invested 200 million RMB to build an innovation-driven and entrepreneurship community. The purpose of this community was to make technological innovation covering every village and town in Nantong. The planned function of this community was for people to work, live, and entertain. After finishing a few infrastructure projects, the commercialized operation of this community went well. In 2009, Technological Innovation and Entrepreneurship Community was renamed Nantong Science and Technology Park Development Co., Ltd.

The second phase was Nantong Science and Technology Park Development Co., Ltd. In 2010, Technological Innovation and Entrepreneurship Community was combined with Nantong Advanced Technology Establishment Center; later, Nantong Science and Technology Park was founded. It belonged to Science and Technology Bureau of Nantong. The main functionality of this park was a technology incubator; it transferred and transformed technology. During the opening year, there were 82 incubated enterprises entering the park, and more and more came in the following years. NITI made assessment of enterprises according to their technological innovations, which increased the efficiency of this incubator. At the same time, NITI made more space for those qualified incubated enterprises to enter in the park. In 2011, Nantong Science and Technology Park was recognized by Nantong Social Development Bureau that technology incubator significantly stimulated the technology improvement of enterprises in Nantong.

The third phase was Nantong Industrial Technology Institute Co., Ltd. (NITI). After concluded experiences from Nantong Science and Technology Park, studied from Industrial Technology Research Institute of Taiwan and Kunshan, Jiangsu; in 2013, Nantong Science and Technology Park Development Co., Ltd. was renamed to be Nantong Industrial Technology Institute Co., Ltd. (NITI). It was invested and managed by Nantong Industries Group Co., Ltd. In 2016, 182 enterprises entered NITI. Among them, there were over 10

research institutes, 3 of which were led by academicians. The total incubating area was 58,180.2 $m^2$ and the total registered capital was 560 million RMB. NITI also signed an agreement to joint development of the industrial bases in both Nantong Development Zone and Binhai Industrial Park. NITI also had a Science and Technology Service Square to provide enterprises that were operating "the Trinity" with management consulting, intelligence property, law, financing, talents, technology research development, and so on. The initial purpose of establishing Technological Innovation and Entrepreneurship Community was for technology innovation. But technology innovation was too broad to cover and the innovation direction of the community was vague. What's more, the operation of the community was not clear. The innovation direction and the operation pattern of Nantong Science and Technology Park were comparatively clearer. The main focus was on technology incubation, and promoting the incubation achievements to enterprises in Nantong so that the business could implement enterprise operation. The technology incubation was a research that Nantong Science and Technology Park did on technology innovation chain; it was also an expansion of industrialization. It was the leading factor that caused NITI to be appeared in front of people's eyes. NITI concentrated on the generic technology and critical and forward-looking scientific problems in the industrialization of Nantong; it had a clear direction and formed a synergy innovation chain that was research institutes research, incubators incubate, and the industrialization. This was also known as "the Trinity".

## 3.2. "The Trinity" Synergy Innovation

"The Trinity" focused on the generic technology, critical and forward-looking scientific problems in the industrialization of Nantong. It collaborated research institutes' research, incubators' incubation, and the industrialization with NITI and formed a comprehensive technology innovation chain.

Research and import science and technology in the light of regional industrialization. The research from the institutes is the core of "the Trinity". In order to meet the needs of scientific technology, NITI imported research teams and technology required teams to establish research institutes. It assigned requested technology to different research institutes and provided them with relevant services. Based on the requested technology, institutes utilized platform to operate research. NITI found branches in different villages and towns to provide services so that the whole area within Nantong would benefit from research achievements. Right now, NITI imports intelligent equipment and architecture research institute, textile science and materials engineering technology research institutes.

Improve the efficiency of technology incubation and transfer. The incubator is the support of "the Trinity". The incubator comes from the equipment that incubates eggs. In the paper eggs mean technology. The incubator refer to space which provides facilitates for research, production and offices, gain supports from policies, law, finance and extension. Its purpose is to support the new technology to be experimented. NITI strictly perform mechanism, improved efficiency. Firstly, NITI expanded synergy innovation line. During the pre-incubation time, NITI cultivate the nursery garden for developing entrepreneurship; during the post-incubation, creates an accelerator; when the incubated outcomes are ready, it will send them to industrial parks in different villages and towns. For instance, for gazelle-like enterprises, which have intellectual property rights, high market share, and a great potential for branding, NITI will mark them as potential well-incubated targets. Secondly, NITI expanded synergy innovation line to create new incubators. It encourages different incubators to expand in different forms, and more and more technological enterprises will be influenced.

For example, NITI finds related technologies; put their achievements to link new platforms. NITI builds an exhibition center to show significant scientific and technological achievements and industrial achievements; and it always exhibits the latest technological achievements in related fields and patented technology products; holds project presentation; provides place for impelling major industries to incubate and industrialize in Nantong. Thirdly, NITI exported incubation services outside. NITI is the research and innovation center of all industrial development in Nantong whose technological achievements and research service platforms are serving for all enterprises in Nantong. NITI has a mutual beneficial and long-term stable cooperation with other surrounding industrial parks. At the same time, it introduces incubated enterprises to related industrial parks. The technology transferring system in NITI contains Nantong University Technology Transfer Center, Nantong Higher Education Technology Transfer Center, and China Innovation Stage-Nantong branch. In 2016, 12 projects were in incubation, which were from enterprises outside.

Establish and Develop S & T industrial Bases. The multiply of industrial bases are the expansion of "the Trinity". According to the cooperation agreements of industrial parks, incubated enterprises will enjoy infrastructure and services provided by the industrial parks; they will also experience the supportive policies on land, financing, market, tax, and government services. Industrial parks will help enterprises to blend into relevant industries in order to agglomerate. There is an intention to cooperate with Nantong Economic and Technological Development Zone, Nantong High-tech Zone, Nantong Binhai Industrial Park, further. The focus of the cooperation will be on the co-construction of Intelligent Building Industrial Park, New Material and New Energy Industrial Park, and Ocean Industrial Park.

## 3.3. "The Trinity" Synergy Innovation Mechanism

The institutes, incubators, and bases are three different nodes on the S & T industry chain. NITI integrates the three nodes as a whole through strategies, services, and benefits (Figure 2). Strategy synergy is the foundation and guarantee of both service synergy and benefit synergy; it determines the direction of "the Trinity". Service synergy blends into every link of synergy innovation research, incubation, and bases; it obtains dynamic service capacity and the coordinative ability. Benefit synergy goes through strategy synergy and service synergy; it is the source.

Strategy synergy of "the Trinity": for China, the synergy innovation of IA collaboration is developed during traditional industrial stage. The strategy synergy is primitive; communication among enterprises, universities, and institutes is not smooth; the level of technology research and innovative cooperation

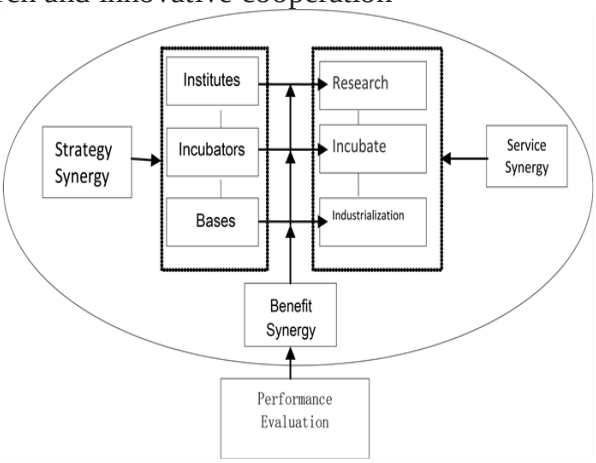

**Figure 2**. "The Trinity" synergy innovation mechanism.

is low. Institutes, incubators, and bases are entities of independent economic interest. Their strategic targets are different, as a consequence, the expected goals will be different; the integration of the three nodes is difficult. NITI uses strategies to make institutes, incubators, and bases concentrate on generic technology and critical and forward-looking scientific technology of Nantong industrial development. NITI ensures the development direction of science and technology. It needs to perform strategy synergy in the following facets: firstly, "the Trinity" synergy innovation should position on major industry and relevant areas. According to industrial development plans of Nantong, NITI's Industrial Technology Research Center investigates and summarizes, and demonstrates issues based on different categories of enterprises; it establishes the generic technology and critical and forward-looking scientific technology in major industries. NITI imports research institute, sci-tech teams, or the technology. Secondly NITI is to formulate the development plan. Institutes, incubators, and bases participate into the plan and understand the overall development goal of NITI.

Service Synergy of "the Trinity": On the basis of the industrial plans of Nantong, NITI links research, incubation, and bases. NITI services for three parts. The first is to attract high-caliber professionals. People are the most important factor of technology innovation. Universities and institutes have a big number of teachers and post-graduate education students; they can provide the transformation of technology innovation. NITI is neither a university, nor supported by powerful enterprises. What's more, the remoteness of Nantong does not have a strong attraction to the high-tech talents. However, through the interaction between internal and external talents, it increases the communications and gatherings of high-tech talents. Until 2016, NITI has one person in Thousand Talents Program, one person in Hundred Talents Program, four people in Innovative and Entrepreneurial Talents of Jiangsu, three in Doctor Group, and fifteen people in Nantong Top Talents. The second is to establish S & T research service platforms. Synergy innovation led by college students has impeccable infrastructure and advanced research facilities and resources; they can continuously expand scientific research place. NITI does not have many technologies innovation resources that can be shared on platforms, mechanism does not function well, and technology innovation barriers cannot be removed easily. The upfront investment in technological research is large, so institutes do not have enough platforms to conduct research. NITI, on the one hand, makes use of the research facilities from Nantong Universities; on the other hand, it establishes platforms, such as co-constructed or independently constructed platforms; it negotiates with large enterprises and makes them build platforms. NITI provides platforms which are built by enterprises and research institutes with facilitation services and helps them to get more government financial subsidies for the establishment and operation of the platforms. 10 public research platforms are built by 2016. The third is to develop financial services. The three nodes in synergy innovation all face the dilemma of money shortage. NITI creates an open and three-dimensional financing system. It attracts VC firms to invest in the technological research, the transfer and transformation and industrialization. NITI co-founded Nantong Yida Innovative Entrepreneurship Investment Company with Jiangsu Advanced Technology Investment Company to invest high-tech incubator project that having self-owned intellectual property right. According to the enhancements in talents, capital and R&D, the three nodes can be combined together, form a virtuous circle entity.

Benefit Synergy of "the Trinity": More than 50 percent of failures in IA cooperation are due to unreasonable profit distributions; in practical, the imperfection of IA cooperation mechanism, distribution system in innovative objects has become a significance restraining factor. The synergy usually produces unexpected consequences; it highly relies on the reliance and joint commitment. The synergy party should take the other party's benefits into consideration, just like treating their own benefits. The benefit synergy emphasizes the cooperating on accomplishing the common goal based on risk sharing and benefit sharing, as well as a fair and honest cooperation environment. In benefit synergy, IA helps the three nodes deal with their individual benefit and their rational interest relationship with "the Trinity".

When initial funds were transmitted to the three nodes in research projects form, the benefit distribution of scientific achievements will be determined by negotiation. If the three nodes' achievement does apply to the regional enterprise and solves scientific problems, the percent of benefit distributions can be lower. After operating and practicing for decades, the faith and ability of risk sharing between three nodes has been increased. "The Trinity" spread the three nodes' risk into IA, increasing their expected returns. In addition, it also expands the profits space in technology innovation.

## 3.4. Performance Evaluation of "the Trinity" Synergy Innovation

In order to form a better synergy innovation mechanism and establish a synergy innovation network to support company's technology innovation and industrial upgrading and be more competitive, IA have its "Unique Skills". Comparing with other synergy innovation technology, the unique skill of "the Trinity" is transferring the three nodes into an organism and making "1 + 1 + 1 > 3" become true to some extent. It specifically reflects on the following two aspects.

"The Trinity" has higher efficiency of technology transformation. In accordance with "Guangming Daily", China's transferring rate of scientific and technology achievements is only 25%, and the really industrialization accomplishment rate is only 5%. The contribution rate of scientific-technical progress is less than 4%, while the rate in developed countries is more than 60%. It reflects the low efficiency in synergy innovation; the scientific and technological achievements didn't support the development of economy efficiently. Although several technology innovations are taking parts in "the Trinity", NITI is doing a good job in the promotion of resource integrating, the allocation of benefits and the construction in technology innovation public service system. It has higher innovation level and management efficiency. Until 2016, there are 11 technology institutes in NITI achieved 102 intellectual properties. During 2013 to 2016, the Intelligent Building and Intelligent Equipment Institute brought around 20 relevant companies gathering together. The material engineering department from Nantong University creates 4 companies successfully, including Nantong Giant Material Technology Co. Ltd.

"The Trinity" gives considerations on both social and economic benefit: The synergy innovation of IA cooperation is a kind of synergy innovation which is dedicated on solving one enterprise's technological difficulties. The economic benefit is more distinct in terms of IA cooperation. The synergy innovation of "the Trinity" is for local industrial transformation and economic development; its major consideration is the whole benefit which means social benefit to IA cooperation. The synergy innovation of IA cooperation is designated for solving one enterprises or an industry's technological difficulties; after technology innovation, the beneficiary is individuals from IA cooperation; the social benefit is not very obvious. NITI

gets profit by serving enterprises (including technology and training services), commercial real estate economy, technology transfer, and return on equity. By 2016, the total assets of NITI have increased from 200 million RMB to 644 million RMB; owner's equity has also increase for 367 million RMB; liability ratio is decreasing gradually year by year and the capability of self-operation is getting stronger and stronger.

In a view of Ronald Coase's theory of enterprise institution, "the Trinity" Synergy Innovation is the substitution of market with enterprise. "The Trinity" is the synergy of institutes, incubators, and bases market integrated into NITI, which means the substitution of the three markets with NITI. Because of the existence of NITI, it has the cost of operating "the Trinity" Synergy Innovation, and is bigger than the cost of synergy innovation of IA cooperation. NITI has been developing and existing for over a decade, it can be backward inducted that the existence of NITI may have increased the cost of operating the organization, but the increased cost is should be way less than the increased benefit that NITI may have brought to the local technology research, technology transfer efficiency; in another word, "the Trinity" Synergy Innovation implemented by NITI has its market value.

# 4. Conclusion and Future Research Direction: Synergy Innovation Undeveloped Areas

In "the Trinity", the institutes are to research; incubators are responsible for the incubation; and bases put the incubated research into practices. It avoids generally problems existed in synergy innovation of IA collaboration by analyzing strategy synergy, service synergy, and benefit synergy. After operation, the efficiency of synergy innovation has increased. In comparison with synergy innovation of IA cooperation, NITI makes progress which is also a type of innovation.

The development from Technological Innovation and Entrepreneurship Community to NITI demonstrates that the market gradually goes on the track of technology innovation according to the economic development trend and the needs for technology. Government has somehow leading roles. When Chinese S & T innovation is in slow-paced development; when local finance is powerful, attempts to solve common problems in regional enterprises, and impel industrial transformation through technology innovation, the semiofficial enterprises which are supported by local finance and operate like an enterprise, could be a shortcut to synergy innovation. Under the circumstances of market-oriented economy with Chinese characteristics, some of these methods could be a way to represent synergy innovation.
The paper only uses NITI as an example to analyze and draw conclusion from it. NITI locates at a comparatively more developed area; local financing power is strong and can support imported S & T research institutes, technology as well as incubators and the development of industrial bases. However, if local financing power is a little weak, how to use an effective form to impel IA cooperation and seek for local industrial transformation and technology innovation, is the next research direction.

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