

# **Research on the Operating Mechanism of Service Integration of Professional Science and Technology Service Institutions: A Case Study of Southern Jiangsu Center for National Technology Transfer**

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**Abstract:** This paper systematically studies the dynamic mechanism, trust mechanism and benefit distribution mechanism of service integration of professional science and technology service institutions. Through in-depth study on the operating mechanism of service integration of professional science and technology service institutions, a service integration model of professional science and technology service. Finally, taking the Southern Jiangsu Center for National Technology Transfer as an example, this paper discusses its integration mode and benefit distribution mechanism, so as to provide reference and thinking for other professional science and technology service institutions.

## **1. Introduction**

As early as 2006, China issued "the Outline of the National Medium-and Long-Term Science and Technology Development Plan", which proposed to vigorously develop science and technology intermediaries and promote the transformation of science and technology achievements. On October 28, 2014, the State Council promulgated "Some Opinions of the State Council on Accelerating the Development of Science and Technology Services", pointing out that China's science and technology services industry has a good momentum of development and the quality of service has steadily improved, but it is still in the early stage of development on the whole, and putting forward corresponding policies to cultivate and strengthen the market main body of science and technology services industry.

At present, although there are many professional science and technology service institutions in our country, the related benefit distribution mechanism is not perfect, which leads to insufficient innovation enthusiasm and unclear functions. Especially, many professional science and technology service institutions deviate from their functions, engage in other business, and lack systematic planning and arrangement for their organization, development direction and main business [1]. Studying the service integration mechanism of professional science and technology service institutions in China is not only of great strategic significance to make overall plans for the development of science and technology platforms, deepen operational services, reform the science and technology system and build an innovative country, but also of great practical importance to realize complementary resources, accelerate industrialization of R&D achievements and build learning organizations.

## **2. Operating Mechanism of Service Integration for Professional Science and Technology Service Institutions**

### **2.1 Dynamic Mechanism.**

The dynamic mechanism of service integration of professional science and technology service institutions refers to the internal, external dynamic factors and the interaction between them affecting

service integration of professional science and technology service institutions.

#### 1) Internal Dynamic Factors of Service Integration of Professional Science and Technology Service Institutions

Internal dynamic forces mainly include three most important factors, namely, economic benefit factor, innovation resource factor and innovation risk factor [2]. Acquiring economic benefits is the most fundamental purpose of all cooperation. Service integration of professional science and technology service institutions is a special form of cooperative innovation. Economic interest is the most important internal driving force to promote cooperation and innovation between science and technology service platform and external professional science and technology service institutions. Therefore, the fair and reasonable distribution of economic interests is vital. Innovation resource factors refer to various invested innovative elements when developing cooperation projects between science and technology service platform and external professional science and technology service institutions, such as scientific research instruments and equipment, science and technology personnel in R&D, management and application, funds and information needed for project operation, etc. Innovative resources are the guarantee of cooperative innovation. Because of the unbalanced distribution of innovation resources among different subjects, it is impossible for a single subject to complete complex innovation R&D activities alone. Innovation risk refers to the loss that may be caused by the failure of innovation. Any form of cooperative innovation activities of science and technology platforms are uncertain, and there are certain risks of failure, which will cause losses to the main partners. Risk sharing is an effective means to reduce the losses caused by failure.

#### 2) External Driving Forces for Service Integration of Professional Science and Technology Service Institutions

The impact of external environment on service integration of professional science and technology service institutions mainly includes three aspects: government requirements factors, market factors and science and technology factors. In terms of government requirement factors, all countries in the world force information disclosure of science and technology platforms through legislation. In the process of service integration of professional science and technology service institutions, it is necessary to maintain strong market awareness at all times. In many cases, the formation of service integration of professional science and technology service institutions is based on the consideration of value creation. The cooperative innovation results among professional science and technology service institutions must meet the market demand. The science and technology achievements formed in the R&D stage need to go through the industrialization stage. Realizing value and gaining profits in the market are the most important external driving forces for the formation of cooperative innovation. Economic globalization has brought about the globalization of competition, and fierce international competition has led both developed and developing countries to pay more and more attention to the development and utilization of their own science and technology resources.

#### 3) Dynamic Mechanism Model of Service Integration of Specialized Science and Technology Service Institutions

Service integration of professional science and technology service institutions from formation to development are the result of the interaction of internal and external dynamic factors. The interaction mode of these factors constitutes the dynamic mechanism model of service integration of professional science and technology service institutions (see Figure 1). The dynamic mechanism of service integration of professional science and technology service institutions refers specifically to the government policy, market and technology factors as well as the internal factors of innovation resources, economic benefits and risk, existing in the external environment of service integration of professional science and technology service institutions.

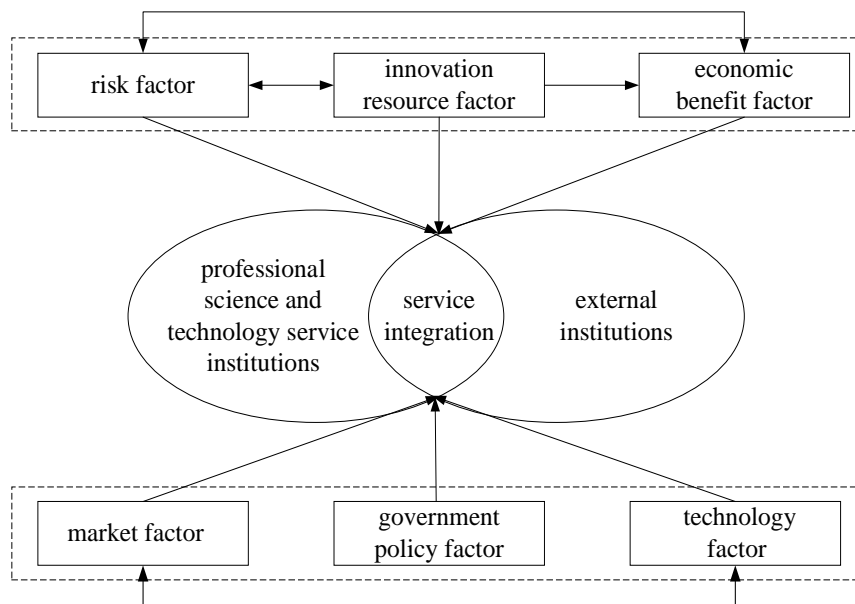


Figure. 1 Dynamic mechanism model of service integration for professional science and technology service institutions

## 2.2 Trust Mechanism.

The establishment and consolidation of trust relationship among professional science and technology service institutions is the premise and important foundation for cooperation and innovation, which can effectively improve the efficiency of cooperation and reduce friction and conflict between them. Trust and cooperation mechanism among professional science and technology service institutions in real life is not achieved overnight. It should include three stages: the formation of trust network, the consolidation of trust structure and the establishment of trust-based cooperation mechanism.

Trust-based cooperation mechanism refers to the management of trust relationship among professional science and technology service institutions, removing the factors that may destroy trust, and making cooperation based on trust as much as possible. In the process of jointly facing market competition environment and jointly carrying out R&D and industrialization, innovators with willingness to cooperate can remove the factors that may damage trust and maintain good trust relationship between the two sides. On this basis, technological contractual relationship and institutional mechanism of mutual learning can be established, and learning ability of both sides can be enhanced.

## 2.3 Benefit Distribution Mechanism.

Under the dynamic mechanism and trust mechanism of service integration of professional science and technology service institutions, cooperative relationship can be formed. The establishment of a fair and reasonable benefit distribution mechanism is the key to ensure the success of cooperation and the re-cooperation.

The process of benefit distribution is as follows: professional science and technology service organizations communicate and negotiate, and use game model to determine a reasonable profit distribution coefficient accepted by each other for future return.

## 3. Operating Mechanism Model of Service Integration for Professional Science and Technology Service Institutions

Based on the previous analysis, we can put forward the operating mechanism model of service integration for professional science and technology service institutions, as shown in Figure 2.

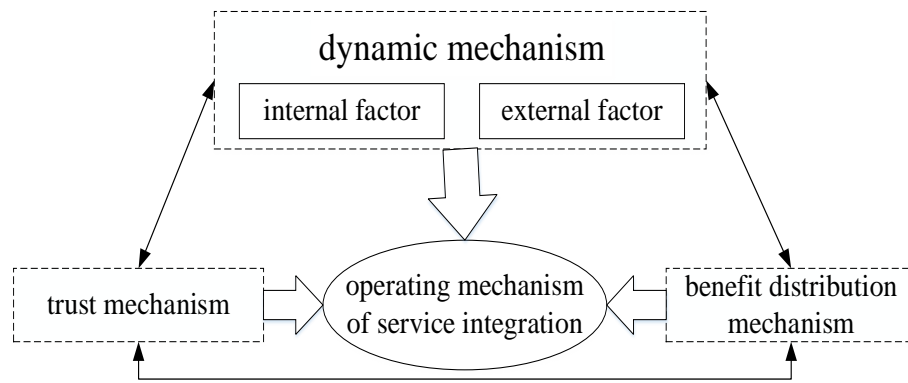


Figure. 2 Operating mechanism model of service integration for professional science and technology service institutions

From the perspective of dynamic mechanism, both internal and external driving factors have an impact on the service integration of professional science and technology service institutions [3]. The former refers to the driving effect on innovation behavior that exists within the cooperation, mainly including economic benefit factors, innovation resources factors, technology knowledge accumulation factors and risk factors. External driving factors refer to the external driving forces of external environment for service integration of professional science and technology service institutions, mainly including political, economic, social and technological factors. Whether internal or external driving factors, to varying degrees, will have an impact on trust mechanism and benefit distribution mechanism. It is these driving factors that promote exchanges and cooperation among professional science and technology service agencies. With the deepening of cooperation and more frequent exchanges, stable trust mechanism and benefit distribution mechanism are gradually improved, so that the whole process of service integration is carried out smoothly and the goal of cooperation is realized [4].

Trust mechanism is the emotional bond of science and technology platforms and service integration for professional science and technology service institutions, and the basis of forming a dependency relationship between them. In the process of integrating services of professional science and technology service institutions, the construction of trust mechanism is the guarantee of promoting mutual trust. On the one hand, trust is the basis of integration services of professional science and technology service institutions. Only when the cooperating parties can be honest and trustful with each other, can the innovative resources be fully circulated and information be fully shared. Therefore, trust mechanism is an important prerequisite for integration services. On the other hand, trust mechanism and benefit distribution mechanism are prerequisites for each other. In the early stage of cooperation and innovation among enterprises, because of the low degree of mutual trust, benefit allocation agreements are often stricter and harsh. With the deepening of cooperation and the continuous improvement of trust, professional science and technology service institutions carry out the discussion of benefit distribution on the basis of mutual trust, so as to establish a mutually acceptable benefit distribution scheme. Reasonable and effective benefit distribution can also promote the improvement of trust.

Effective benefit distribution mechanism is the basis of integration services of professional science and technology service institutions. It guarantees fair and reasonable distribution of benefits from integration services among participants [5]. The benefit distribution mechanism, dynamic mechanism and the trust mechanism are mutually influential. Professional science and technology service institutions can gain more benefits from integration services than from innovation independently, which is the goal and result of cooperative innovation. If the benefit distribution mechanism is effective, it will enhance the trust of players, reduce the risk factors in the dynamic mechanism so as to ensure the success of integration services of professional science and technology service institutions.

To sum up, only when the operating mechanism of integration service of professional science and technology service institutions is coordinated and consist, interact with each other and have a

positive effect on cooperative innovation, can service integration have long-term and sustainable successful.

## **4. Case Study of Southern Jiangsu Center for National Technology Transfer**

### **4.1 Platform Introduction.**

Under the guidance of the Science and Technology Bureau of Suzhou, the independent innovation service supermarket (platform) of Suzhou has been built with the integration of various resources of the Southern Jiangsu Center and the Suzhou Government by the Suzhou Kechuang Fengyun Information Technology Co., Ltd. The goal is to create a high-quality operation service provider of a comprehensive science and technology service platform with internet technology as the core, and to provide science and technology advisory services, intellectual property services, inspection and certification services for enterprises, scientific research institutions and government agencies.

### **4.2 Platform Composition.**

Guided by the needs of enterprises, the Southern Jiangsu Center for National Technology Transfer has established a service integration model of the Southern Jiangsu Center for National Technology Transfer by integrating science and technology financial service institutions, science and technology achievements transformation service institutions, science and technology information advisory bodies and R&D resource sharing service institutions, and focusing on these four types of professional science and technology service institutions.

Science and technology financial service institutions. It includes banks, venture capital, guarantees, science and technology insurance and other financial institutions by establishing the online "science and technology financial supermarket". This "supermarket" forms a complete interactive network of science and technology financial services by integrating the resources of the government, financial institutions, intermediaries and science and technology enterprises.

Science and technology achievements transformation service institutions. Through integrating domestic and foreign technological resources and innovative service model, the transformation institutions provide relevant professional services for enterprises in the region, including: providing services for enterprises such as docking of achievements, bidding for difficult problems, training of technical brokers, archiving of achievements transformation projects and rewarding of Technical Brokers.

Science and technology information advisory bodies. Through the service mechanism of online and offline integration, science and technology information advisory bodies provide multi-dimensional support services for R&D personnel to innovate enterprise development management and management decision-making. At present, there are 20 science and technology information advisory service organizations in the Southern Jiangsu Center for National Technology Transfer.

R&D resource sharing service institutions. R&D resource sharing service institutions use modern technologies such as information and network to build an open science and technology infrastructure and public service system to promote the efficient allocation and sharing of science and technology resources in the market.

### **4.3 Integration Model of Professional Science and Technology Service Institutions.**

The Southern Jiangsu Center for National Technology Transfer adopts three main integration modes: co-construction entity mode co-construction entity mode, cooperation mode and supermarket service mode to integrate various professional science and technology service institutions.

#### **4.3.1 Co-construction Entity Mode**

The co-construction entity model refers to the establishment of a new organizational entity by the comprehensive science and technology service platforms and professional science and technology service organizations, which centralizes multi-party funds, equipment, technology, information and talents, shares resources, allocates resources together, unifies planning and management, and

optimizes the overall allocation of resources.

For example, in 2015, Suzhou Independent Innovation Square Development Co., Ltd. and Jiangsu Fengyun Science and Technology Service Co., Ltd. established a joint venture company, Suzhou Kechuang Fengyun Information Service Co., Ltd., which is responsible for the construction of "Independent Innovation Service Supermarket" on the operation line, undertaking the integration of online science and technology service institutions and the construction of science and technology service network.

Suzhou Independent Innovation Square Development Co., Ltd. and Suzhou Zhongyuan Construction and Development Co., Ltd. established a joint venture company, Suzhou Lanchuang Science and Technology Industrial Park Management Co., Ltd., which is responsible for the investment construction and operation management of off-line entities.

#### **4.3.2 Cooperation Mode**

The mode of cooperation refers to the integration mode of professional science and technology service organizations, in which comprehensive science and technology service platforms and professional science and technology service institutions sign contracts to provide funds, equipment and personnel for business development.

Specifically, through signing agreements with science and technology financial service institutions, science and technology achievements transformation service institutions, science and technology information advisory bodies and R&D resource sharing service institutions, the Southern Jiangsu Center for National Technology Transfer unifies the allocation and use of resources under the constraints of contract and platform system, in order to achieve the scale effect and complementary effect of platform resources. At the same time, it can reduce the integration cost of science and technology resources.

#### **4.3.3 Supermarket Service Mode**

Supermarket service is a comprehensive science and technology service platform. According to the scale and type of integration of professional science and technology service organizations, it opens a "supermarket" to provide self-service for users. Users can choose, collect and purchase in the "supermarket" according to their own needs. Supermarket service makes it an open and autonomous service mode. Supermarket service requires platform service personnel to monitor the whole process, including the credibility of both suppliers and consumers, service progress, cost settlement and other issues. Supermarket service is a typical one-stop service integration mode, which greatly improves the convenience for users to access services.

The integration of professional service organization. Taking the integration of science and technology financial services professional service institutions in the Southern Jiangsu Center for National Technology Transfer as an example, the center integrates the business of banks, venture capital, guarantee, science and technology insurance and other financial institutions, and provides comprehensive science and technology financial services for enterprises through the "online science and technology financial supermarket". At present, the number of supermarket platform warehousing enterprises has reached 13695, gathering 150 science and technology financial service institutions, 1583 science and technology financial service personnel resources, 342 science and technology financial innovative products. In addition, Suzhou Kechuang Fengyun Information Service Co., Ltd. is responsible for the construction and operation of online "Independent Innovation Service Supermarket" to integrate more professional science and technology service institutions.

### **5. Conclusion**

The transformation ability of science and technology resources and achievements is directly related to the speed of upgrading national science and technology innovation ability. Open sharing of science and technology platform is the premise and foundation of service integration mechanism of professional science and technology service institutions, while service integration mechanism of professional science and technology service institutions is the expansion and deepening of open

sharing of science and technology platform. Service integration of professional science and technology service institutions is of great significance to complement and share innovation resources, transfer and transformation of science and technology achievements, and improvement of innovation capability.

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