Construction and Operation Mode Research of Regional Public R & D Platform

Xia, Xiaowan
Shanghai University of Engineering Science

Abstract

This paper studied the localization of research and development of regional public service platform. Based on its main functions in the innovation process, this paper discusses the research and development of regional public service platform for the construction of the model. Then according to the different platform main body in the platform play different roles and have different function, contrast analysis the current three main operating modes of the regional public research and development platform.

Keywords: public R & D service platform; Technology Public Service; construction mode; operating mode

With the rapid development of science, technology and business competition, technology life cycles are getting shorter and shorter, as well as investment in R & D activities are getting increasingly high. Some research and development activities can not be afforded by one enterprise or a few enterprises. We need to have an enterprise cooperation organization that has the common R & D needs, thus lead to the birth of the public R & D center. Public R & D platform is a technology research and sharing service system, which treats public service as the purpose, uses professional technic as guidance. It is a system with the Government's promotion, resource sharing, principles of industry research and development to enhance the strength of construction, and still use the sharing mechanism. Public R & D platform is constructed of modern information technology; it has reasonable layout, complete system as well as it is fully functional, open and efficient. Public R & D platform is an important part of the regional scientific and technological innovation system.

1. The Position of Regional Public R & D Service Platform

Regional public R & D flat's major purpose is to promote the local economic and social development of science and technology service activities. It was constructed by a group of organizations which has a wealth of high-quality scientific and technological base conditions and a great advantage in research, development and service. These organizations include regional research institutions, universities, key enterprises in different industries and science technology intermediary agencies. Regional public R & D flat has the following three aspects positioning.

First, regional public R & D flat is technology infrastructure services. Public R & D service platform is to provide public service activities in science and technology class quality infrastructure, provide good technical support and resource services for clients maintain and enhance the quality and level of infrastructure to provide better service to users.

Second, regional public R & D flatis the rational allocation of public resources carrier. Public R & D service platform is the rational allocation of resources and equitable use of the carrier, the integration of existing R & D, full use of information, networking and other modern technology, the use of international and domestic scientific and technological resources, construction has a public good, basic public scientific and technological base platform, provide basic conditions and public services for R & D and industrialization of science and technology, to ensure fair and rational use of resources. The platform has achieved a process of rational allocation of public resources, the government, and also do honor to the fair use of government resources.

Third, regional public R & D flat is a platform which opens to the whole society. Public R & D service platform is a carrier that can achieve public technologic service. It can promote the survival and development of public services on the carrier, so the R & D Public Service Platform is open to the entire community, and all members of society have totally equality of rights to use. Of course, reality does not fully achieve this position, so the position is mainly for service for the platform where the service area is. And with the further development of the platform, it will expand the range of service and used by more communities.

2. Functional Areas of Public R & D Service Platform

Public R & D center is the industrial groups or between enterprises and universities, research institutions and innovative for a common goal, put their superior resources and capabilities, establishing in the process of division of work together to complete the technological innovation in the open, long-term, formal innovation cooperation and exchange relations linking behavior and basic institutional arrangements. Public R & D center construction should highlight openness, sharing and service, making it not only as a regional R & D equipment, personnel, sharing platform and service platform of funds, but also to stress the importance of the introduction of foreign advanced R & D institutions in developed countries, equipment, talent and money to build a world-class research and development of equipment manufacturing platform.

2.1 Resource Integration

The primary function of public R & D service platform is the integration of technology innovation resources gathered by itself has a strong cohesion can be scattered distribution technology, information, personnel and other technological resources gathered on the carrier's web platform, through various innovative elements communication, intercourse, Evolution comprehensive integrated development of innovative utility, reduce waste R & D resources, and promote the flow channels of talent, technology flow, information flow more smoothly, at the same time makes the regional technology innovation condition and environment more superior.In the daily management of the public, government control and dominate the vast majority of public resources, and public R & D service platform in addition to the integration of resources, we should also ensure the rational allocation of public resources and the equitable use, to achieve its social and fairness, in other words, the development of public service platform service process is not only a process of rational allocation of public resources the government, but also the government commitment to the community to ensure the equitable use of public resources to be honored, or an important prerequisite for the development of functional government to build a public service platform implementations and the foundation.

2.2 Innovative Services

Public R & D service platform have the capability to help implement the public scientific and technological innovation services. It provides innovative resources for each subject, especially for SMEs, in order to reduce the cost of innovation enterprises.

As a public service integrated hub, platform has the function of social services and community transit radiation elements. The platform is not only provides innovative resources, but also provides appropriate technical support services. From the perspective of the innovation chain, public R & D service platform covers the entire process chain in the product conception phase, can be information consulting services, promote enterprise to form a good product concepts. In the product development process, the platform offers the industry key, common technical advice and trial, in order to better meet the business needs in product technology. Platform for enterprises to provide the necessary conditions for the development of equipment, or to provide enterprises with a direct product design services. After molding it can provide product performance testing services. In the latter part of the market process, the platform can help companies solve specific problems, the staff of technical training and other services to make our products successfully to market.

2.3 The Function of Complementary Linkage

Complementary functions of public R & D service platform is mainly reflected in two aspects complement each other and complementary technologies. Complementary means of public R & D service platform through network integration advantages of the parties, to construct a multi-body harmony, can learn from each other, communicate with each other and learning from the objective environment is conducive to the parties complementary advantages, to promote communication and interaction through multi-understanding, not only conducive to consensus, but also create more opportunities for cooperation, increase the possibility of the formation of complementary relations, reduce transaction costs and management costs resource aggregation and innovation generated in the process. Complementary technology refers to a subsystem under public R & D service platform will produce so-called positive spillover effects, that is, a sub-efficiency technology innovation platform with the other sub-platform technology will enhance the efficiency and enhance innovation, technology and market coordination only together, will have innovation, we can say, the process of interaction and cooperation of public R & D service platform is a complementary process to improve efficiency through technology innovation.

2.4 Innovation Aggregation

Public R & D service platform in the service, have a strong multiplier effect of the exchange process. Enlarge doubling the effectiveness of the various subsystems of the original innovation, research and development of public service platform has the advantage of the complementary capabilities and technologies complementary function determines the overall system itself is also innovative methods function, it is in a strong cohesion capabilities and complementary functions as a platform, making the sub-platform links closely coordinated parallel, creating a powerful driving force for innovation, the innovation effect is doubled.

3. Regional Public R & D Platform Construction Modes

Public R & D platform for an institutional arrangement is of strategic significance, R & D cooperation is no immutable fixed pattern, but should be flexible. To public R & D center for the development of resource integration of the carrier, to form a full coverage of the R & D network, from the network path links embedded perspective of cooperative R & D cluster enterprise network link mode, a common platform for regional R & D activities with a certain operability and practical significance.

3.1 Common Technology-Oriented Network Link Mode

Led by public R & D centers to the core manufacturing business based, common technology as a starting point to build industrial R & D cooperation network, making it the industry technology platform, provide technical support for the industrial cluster of all enterprises, the majority of enterprises to mobilize the enthusiasm of the cluster . Development of common technology investment, high risk, technology spillover effect is more obvious, the "free rider" phenomenon. If the cluster syndication, through collaboration with external technology sources for research and development, you can reduce costs, reduce risk and achieve continuous, dynamic technological progress. Absence of common technology research and development has become a bottleneck restricting the development of the industry, and as a single enterprise with limited resources, the need to coordinate the integration of public R & D platform to build a relatively complete system of technology development.

3.2 Project-Oriented Network Link Mode

This mode is usually the major projects in the enterprise as a starting point to build a cluster of R & D collaboration networks, the establishment of R & D team based on user demand, to produce "the first sets of" products. For large complete sets of equipment and very large systems equipment, such R & D model purposeful, strong power within the corporate R & D, product development and technology development simultaneously, multi-disciplinary teams and the formation of internal and external linkage cluster enterprises cooperation, not only technological innovation breakthrough sex, industry-leading, market exclusivity, but also to attract social investment in R & D resources, supported by the project owner and relevant state policies and other aspects. Complete sets of equipment should have the core capabilities of large enterprises as the main body, to participate in major equipment packages or total package. Supporting SMEs to promote specialized, sophisticated, special, superior development, accelerate core manufacturing enterprises to "production + service type" make public R & D platform gradually become engaged in system integration and equipment, complete sets of technology integration body.

3.3 Import Substitution-Oriented Network Link Mode

The key public R & D center to replace imported products in the domestic market as the starting point to build R & D collaboration networks, the introduction of secondary technical innovation, product import substitution, so that enterprises can be starting point, a short time to learn and master the latest industry technology, to rapidly improve business competitiveness.

4. Regional Public R & D Service Platform Running Modes

Public R & D service platform based on common objectives and tasks enable members together, but each member has its own organization, culture and strategic objectives, these potential differences are likely to lead to a series of uncooperative behavior, opportunistic behavior, making the R & D or service failure, combined with the construction and operation of the platform itself is a systematic project involving many aspects, if not a viable platform operating mode, the platform will be difficult orderly, healthy run, so clearly the target platform and motivation needed to build a series with the appropriate operating mode, which regulate the orderly operation of the platform.

4.1 Factors Affecting Industrial Technology Platform to Run Public Services

Factors affecting the industrial technology to run a lot of public service platform, summarized in the relationship between the external factors and internal factors, and platform between the main three areas. External factors which mainly refers to the factors which the political, economic, social and technological development platform, which is the main source of uncertainty platform, the platform structure is one of the main changes; internal factors platform owned mainly refers platform hardware and software resources collectively, it is the underlying platform, directly determines the efficiency of platform services and operation; main platforms include government, enterprises, research institutes and universities, cooperative relationship between them is the core platform to run, but also because of the platform body belongs to a different organization, different forms of cooperation, such as different contact tightness caused by coordinating relations between the various body becomes a difficulty, and this is what platform to run mode select key and built.

4.2 The Main Participants of Platform

Industrial technology public service platform is the government, enterprises, universities and research institutes, such as the main platform for the industry to overcome in order to achieve common key technology research and development challenges and to jointly construct, in which the status of each subject in different platforms running mode and the role is different, thus the effective functioning of the platform were also playing a different role.

4.2.1 Government

Industrial technology platform to both promote public service needs of economic and social development, but also the transformation of government functions, highlighting the need for its service-oriented government, government operations and the development of industrial technology platform for public service has a crucial impact, showing its platform important role cannot be ignored. First, the Government, as a shoulder on the macro-economic and social management responsibilities of the executive agencies, must play its functions and advantages in terms of macroeconomic management, since such functions and advantages of enterprises, universities and research institutions cannot match; Second, in a market economy under the government itself, although not directly interfere in business operations, but as a responsible government agencies, organizations must take to build and run public service responsibility for coordinating industrial technology platform, and then to encourage enterprises to rapid and healthy development, we can see a platform Government cannot shirk responsibility; again government funding to build on the platform is a prerequisite for the initial platform to build and regulations formulated by the government is to protect an important condition for the healthy development of the platform. Overall, the government public service in industrial technology platform to do is work in four areas, namely, guidance, support, guidance and services. First, choose the right time to guide the establishment of industrial technology public service platform; Secondly, the development of industrial technology public service platform to provide policy support and financial support; again, during the construction of industrial technology in the public service platform to strengthen guidance; Finally, strengthening public service platform for industrial technology services and other intermediary organizations.

4.2.2 Enterprises

As the main innovation part, enterprises have their own unique advantages in platform construction and development. Specific performance is both builders platform is user platform, and the need for their participation in a given enterprise needs to adapt, and this resulted in the platform not only the most close to the market, can quickly capture market information, to adapt to the change, and business is the development and production of intermediate connecting hub, is to achieve R & D results and marketization of goods necessary way through its transformation and technological achievements market more targeted, higher technology conversion efficiency. Platform development and construction companies in the following major role to play: First, the platform itself is to make the R & D results into a transit point for goods, companies can quickly gain an advantage with its market demand and changes in the information, so that scientific and technological achievements can be more quickly and efficiently achieve the transformation ; secondly enterprises not only gather a lot of advanced equipment, laboratories and other important hardware facilities, but also attracted a large number of high-quality scientific and technological personnel, and these are not missing an important source platform for scientific and technological resources; finally provided in addition to the government platform support funds, the enterprise as a platform for the development of injection of funds is an important guarantee for the platform to promote sustainable development.

4.2.3 Universities

All along time, universities in society are always acting as such a service role. Universities can foster high-quality scientific and technological personnel, technological innovation and research in the social welfare. This resulted in its becoming the platform for the development and operation of an integral part. The large number of colleges and universities is not only rich area of technological resources, but also gathered a lot of outside technology resources are difficult to obtain, such as bibliographic databases, libraries, laboratories and other important hardware facilities, as well as high-quality research talent, a lot of research achievements and rich cultural heritage and other software environments. If these rich technological resources applied to the platform, so the platform complementary resources, industrial technology and scientific research combined, will accelerate the rapid spread of new technologies and the results of the conversion, improve service efficiency platform.

Colleges and universities in the development and construction of the main platform to play the following roles: to build and run to provide comprehensive support for the platform of talent, training skilled personnel for various industries and platforms, overstating technology professionals; university is the industrial technology innovation "core", university gathering a large number of scientific and technological resources and technological innovation and industrial development as a platform for continuous blood transfusion, providing endless power for its development; intensive universities is not only intelligence is intelligence source, a large number of scientific and technological personnel, especially university research high academic reputation and attainments staff both to attract a considerable number of industry funds, but also play with "think tank" for the government and business decision-making role.

4.2.4 Research Institutes

Research institutes has been committed to research activities, it has always been scientific and technological personnel and research gathering place, is the contribution of technological innovation and scientific and technological achievements of the backbone. Research institutes and industry-intensive technology resources not only targeted, its operation of the downstream industry has a strong correlation, excellent research conditions and other advantages, resulting in its leading role in the industry and leading technology research and development of doubt, in platform development the role and status should not be underestimated.

Colleges and universities in the development and construction of the main platform to play the following roles: First of all, research institutes, technology is strong, rich professional human resources, which can not only provide essential such as engineering centers, large specialized equipment, laboratories and other facilities for the hardware platform development, You can also provide the platform and industry researchers; secondly research institutes as a pioneer in research and development strength, its adequate R & D funding, strong R & D capabilities and fruitful platform for the development of scientific research can continue to inject vitality.

4.3 Regional Public R & D Platform Specific Mode of Operation

4.3.1 Government-Led Model

Due to the common industry key technology has quasi-public goods properties, which enables individuals or companies are thinking "free ride" and do not want themselves to research and development, which requires the government to be involved in industrial technology-led public service platform construction and operation, namely platform government-led model. Platforms such operation mode is mainly established by the government investment, take a leadership responsibility, business, industry R & D centers and industry associations to join a membership form, providing common technology innovation services for SMEs in the cluster. This mode is highlighted in the government platform specific operation process, the relevant government departments responsible for planning, functional design, operation and management platform to ensure effective play platform capabilities; actively with universities, research institutes, intermediary organizations, financial institutions, higher other relevant government departments and other agencies to get in touch, to promote interaction and communication platform between them, seek more support and help, and constantly improve the platform capabilities; investors also play the role of the laboratory in charge of the place supply, research and development and equipment investment in infrastructure and funding to purchase equipment, hire staff costs; through the development tendency of preferential policies for enterprises to provide good working and living conditions, and create a favorable environment for innovation.

Advantage of government-led model platform: under government-led model can take full advantage of financial capital, administrative rights, to ensure that the process of platform construction and operation of funds, facilities are relatively easy to obtain; effective integration of technology resources within the industry to avoid common technology repeat research and development, science and technology a waste of resources; policy by providing targeted support, guide enterprises, universities, research institutions and intermediary institutions involved in the construction of the platform, to play a catalytic role in research cooperation, reducing corporate commitment to key technologies, common technology research and development risks, lack of R & D capabilities for the majority of SMEs to provide services, and promote common technology research and development results and effective promotion.

Lack of government-led model platforms exist: government-led model focuses on government macro-control, making the platform in the course of the market is not high, pertinence, we cannot fully mobilize the enthusiasm of enterprises; combined business has always been for making profit. Nature does not participate in the platform to build profitable, so companies actively involved in the construction of the platform is not high, resulting in advanced technological resources within the enterprise cannot be fully utilized, platform running mechanism is not flexible.

4.3.2 Dominant Mode of Enterprises

In the increasingly fierce market competition, the level of business R & D directly affects their survival and development, this time leading enterprises play an important role in technological innovation, and establish a platform for the dominant mode of leading enterprises, thus enabling enterprises to public science and technology resource sharing to reduce innovation and entrepreneurship have become cost-optimal choice. Platform dominant mode of enterprises mainly rely on various industries in the leading enterprises, research institutes and universities gather relevant resources to build, nurture independent innovation capability, enhance the technical strength and reserves to deal with competition in the industry challenges and opportunities.

In the specific operation of the process, industry-leading enterprise platform for building the main, the establishment of an independent legal entity, the relevant personnel from leading companies part-time, according to their own development needs, in order to solve their own problems to motivate other ancillary businesses upgrade their technology within the industry; virtue the advantages of the device, providing quality testing and other services in the government under the guidance of industry leaders to coordinate the formation of joint-stock companies, market-oriented operation.

Advantages of leading enterprises in the dominant mode platform: to leading enterprises to build industrial technology-led model of public service platform, enterprises as the main innovation, market operation ability, can give full play the enthusiasm of enterprises, platform high flexibility, making corporate technology resources are effectively use; company's most close to the market, allowing companies to quickly discern the market needs in order to improve the relevance and flexibility of the technology research and development to accelerate the combination of technology and practical application of research results in order to achieve scientific and technological achievements to improve the conversion rate.

The shortage of leading enterprises in the dominant mode platforms: the dominant mode of leading enterprises to build a platform for enterprises due to lack of funds, facilities, etc., and thus cannot guarantee the efficient operation of the platform, resulting in reduced ability to platform services; companies typically seeks profit due to difficult requirements it provides for other companies within the industry, more services, resulting in a positive and open platform for the enterprise are not high degree of scientific and technological achievements will be difficult to effectively promote; while the dominant mode of leading enterprises to build a platform, most staff are part-time, resulting in its investment platform construction and operation of energy is not enough to focus, thereby affecting the platform to effectively play the role.

4.3.3 Strategic Alliances Dominant Mode

The dominant mode is a new strategic alliance partner organizations under market economy conditions, "the official research" combined, is a breakthrough of traditional modes of cooperation to deepen senior research new cooperation model evolved.

Strategic alliance led model refers to the government, enterprises, universities, research institutions, research institutes, trade associations and other organizations to their individual needs and common interests as the basis, to enhance industrial technology level of public services as the goal, to have a legal effect contract that formed the joint development of complementary advantages, resource sharing, equal opportunity, risk sharing, cooperation and common development organizations to jointly responsible for running the platform. So as to achieve decentralized industrial generic technology development risk and shorten development cycles and improve the ability to overcome common technology industry.

In particular during the operation, the platform construction funds invested mainly in government finance, corporate investment supplement. In the case of a relatively strong industry associations, you can take the "official research + Industry Association," or cooperative joint-stock form, industry associations (Cooperation Organization industry) involved in innovation platform, each organization member companies jointly implement technological innovation projects, accelerate the transformation of innovations, the interests of all aspects of coordination and cooperation generated in the process, to achieve functional complementation; industry associations in the absence of circumstances, you can use the "official research + corporate members' shares in cooperative form, to replace part of membership the role of industry associations; has integrated functions for public service platform for taking "official research + promotion agencies" in the form of joint-stock cooperative system or to implement market-oriented operating platform.

Advantage of strategic alliances led model platforms: strategic alliance partnership to build a dominant mode of government, businesses, schools and research units, a variety of advantages to integration, weak to offset test from the test, in the industrialization of scientific and technological resources of the project combine to make the cost of research and innovation to effectively reduce risk, close combination of technology and economy; this mode of operation with a high degree of organization of strategic alliances body closely cooperate and steady, so that innovations can quickly achieve industrialization, thereby promote industrial structure optimization and upgrading the main advantages. Because this model has significant advantages, many developed countries such as the U.S., Germany and Japan all have this model of practice and success.

The shortage of strategic alliance-led model platforms: All parties involved in running platform as main participant, if interest distribution mechanism is not perfect, there will be a lot of problems. Such as it will inevitably lead to uneven distribution of benefits all parties, intellectual property ownership is unknown, unsustainable development platform, the disorder operation of platform and so on.

5. Conclusions

With the construction and development of public R & D center will continue to strengthen its functional position. Following the basic idea of market-based economic development, every step of the construction of public R & D center will meet the market needs, and constantly improve the level of regional and technological research and development capabilities, it will help public R & D center make a great contribute to the regional research and strategic development.

In the near future, public R & D center will become an important system to protect research and development activities and enhance our capacity for independent innovation.

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