

Problems and Safeguard Measures in Science and Technology Foundation Platform Operation of China*

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Abstract Science and Technology Foundation Platform is an open social system, the construction and operation of which is affected by many factors. Taking from the aspects of operating resources, financial investment, talents construction, etc., this paper analyzes the organizational security system of the Science and Technology Foundation Platform operation in China, and proposes safeguard measures for our Science and Technology Foundation Platform's effective operation on the existing problems, for the purpose of providing references to the efficient operation of this platform.

Key words Science and technology foundation platform; Platform operation; Improvement measures

1 Introduction

Science and technology foundation platform is an open social system, the construction and operation of which are affected by external environment, they're interacting and closely linked with each other. The environment, finance, talents and law, etc., constitute the security system of the operation of the science and technology foundation platform, supported by these factors with security, the operation of science and technology foundation platform can be ordered. The security system of our science and technology foundation platform operation, after years of accumulation and development, has certain basis, but on the whole, it is still weak, needing further improvement and innovation so as to realize the sharing of science and technology resources and ensure the benign operation of the science and technology foundation platform.

2 Problems in Our Science and Technology Foundation Platform Operation

2.1 Science and technology foundation resources' lack of unified planning

At present, the resources of the science and technology foundation lack the unified overall planning, existing many problems like dispersion of resources layout, repetitive construction, waste of resources and unbalanced distribution, which largely restrict the sharing and full use of the science and technology resources.

The science and technology resources present the phenomenon of agencies dispersion and each doing things in their own ways. Quite part of the science and technology resources scatter in various management department and research units, and even some fairly academic valuable scientific data and literatures with many years of accumulation fall into the hands of the individuals, and disappear with the retirement and death of the owner of them, unable for continued preservation. The dispersible layout of the science and technology resources increase the difficulty of the collection, classification, preservation, research development and evaluation of resources, the resources sharing and the informationization of resources, leading to the serious phenomenon of low utilization, repeated purchase and waste of them, etc.

The development and utilization of science and technology resources are imbalanced. The development of our science and technology resources lacks the overall planning and systematic coordination of the state level; some are constructed repeatedly, very wasteful, while the development and construction of some are still in the blank; there're great differences in the development and utilization of science and technology resources between different disciplines and different stages.

2.2 Problems in resources sharing of the science and technology foundation

Comparing with the developed countries, China's science and technology resources sharing is still in the low level, or even doesn't arouse enough attention to most people, and hasn't formed a good social cultural atmosphere, mainly embodied in the following two aspects of problems.

After New China's establishing, the long-term planned economic system makes the resources of our science and technology foundation long exist the situations of nation investment and single department

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or individually-owned, the possessors of the science and technology resources often don't contact with each other, and only focus on the construction of their own department's with the ignore of others' and the nation's resources sharing.

Some departments exist the thought of "desire for more and whole", not willing to provide their own resources of science and technology to others, and those departments lack of them have to spend huge human, material and financial resources on their purchasing, once possessing them, they are facing the problem of leaving them unused or wasted, resulting in the low utilization rate and seriously repeated construction of our total large amount of resources. There's data shows that the quantity of the scientific instruments in China is larger than the total of 15 European Union countries, but the utilization of many equipments is less than 25%, while it of the developed countries is as high as 170%~200%. The underwater robots America used for marine scientific research spend 150 days in a year on average doing underwater researches, while ours' spend only few days^[2].

2.3 Insufficient investment in science and technology with many problems

Insufficient total investment of science and technology conditions. At present, our country's investment of science and technology is very limited, for example, there're about 0.7million sci-tech periodicals published each year in the world, and about 66 thousand periodicals are very important, but China has only purchased less than 10 thousand. Our R&D funds take only 4.7% of American's, Japan's 8.9%. England spent 1000 million pounds on foundation platform construction from 2002 to 2004; Switzerland uses 80% of the investment in science and technology for its platform construction, while our proportion of investment is far behind them.

Improper investment of Science and technology conditions, heavy attention on their construction and light on the operation. Relevant departments tend to only emphasize the construction of new resources, but ignore the operation and management of the existing resources, lacking continuous and stable investment on the fundamental areas. Therefore, it's easy to cause input waste in earlier stage, and the insufficient fund of the maintenance, update and purchase of the consumable parts in later stage lead to the prominent problems of idleness and high failure of equipments.

Dispersive and repeated investment and of science and technology conditions and the lack of overall allocation. Our financial technological investment is very dispersive, there's lack of efficient contacts between departments, causing division and units' owned situation as well as low-level repeating. Meanwhile, the lack of coordination and configuration optimization by government and the control of important channels for technological conditions construction funds by different departments cause the low utilization, shortage of funds and repeated purchase phenomenon.

2.4 Prominent problems in talents construction of science and technology

Talent structural imbalance and the lack of professionals. The professional skills of the staff who undertake the elementary work of science and technology have direct influence on the quality and efficiency of the scientific infrastructure technology and operation. China lacks a large number of workers, observers, statisticians, administrators who work on the basic science in facilities maintenance, operation and self-innovation, and possess a sense of openness and share. While in training and education, there is no special discipline training the this part of staff, resulting in the low quality of professionals working on the technology infrastructure construction and operation and leading to the inability to operate some imported and advanced equipment.

Unstable talents team and serious loss of them. In China, the system of attracting and cultivating creative talents for Science and Technology Foundation Platform construction is imperfect and the performance evaluation and incentive mechanism is also unreasonable, we often use the scientific research personnel's academic standards to measure the professional management and the technicians. Meanwhile, the insufficient related investment results in the lack of attractiveness of the operating posts, and drains them of their energy and their enthusiasm. Therefore, professional talents change their occupation one after another, and the problems of talents loss and aging of the stuff, etc. become more and more serious, which restrain the construction, operation and sharing of our Science and Technology Foundation Platform to a certain extent.

3 Organization Guarantee System for the Operation of Science and Technology Foundation Platform

The system is composed of three parts, as showed in flow chart6-1. Each organization should be clearly responsible for their tasks and cooperate with each other to put this system in full play.

Vertical organization structure is a reflection of the government's macro-control ability and

supervision responsibility. Led by state of council-consigned Science and technology department, composed of NDRC(national development and reform commission), treasury, education department, CAS(Chinese Academy of Science), SCSTNDI, ministry of health and ministry of agriculture, etc., 16 ministry or commission, the minister union takes charge of the coordination and decision-making among different departments. Panel of experts and consultants are involved in work like decision-making and construction program as well as the project proof of the platform construction etc., to provide intelligent guarantee for the construction and operation of the Science and Technology Foundation Platform. Administration commission is responsible for making and enacting relevant policies, development plans and proposals of the platform construction, as well as for other specific managerial work in construction and operation. Based on the Science and Technology Foundation Platform organization, the subsidiary platform organizations set up their own administration commission and panel of experts and consultants. Local platform organization can set up special organization in the related science and technology department to charge the platform construction and operation. Vertical organizations place themselves in right position with clear responsibilities and realize the resources integration, the platform construction as well as the top design and organization of managerial system to guarantee the construction and operation of Science and Technology Foundation Platform.

Horizontal organization structure is a relation structure among organizations in possession of resources that should be shared. Science and technology resources sharing involves a great many departments and organizations. It is in need of the establishment of an effective organization to guarantee the successful share of resources. In modern society, it can be achieved via Internet and technical method used to form virtual union which is the often-adopted organization structure by horizontal organization whose common organization way is broad system. The broad mainly takes charge of drawing out the policy of science and technology resources, evaluating the whole condition of the science and technology resources construction and service operation, assessing the development plan and major regulations of the science and technology resources construction etc.

Internal organization structure is composed of comprehensive department, survey coordination section, sales section1 and 2 and operation supervision section under The Science and Technology Foundation Platform center. The comprehensive department is mainly responsible for work like making and perfecting all kinds of regulations of the centre, checking and supervising the operation, assisting the center's leaders to balance administrative affairs and assuming HR management. Survey coordination department takes charge of strategic research in fields of pilot foundation, science data sharing, internet science environment and the commercialization of research findings of the platform construction project as well as the research in annual construction demand of the relevant platform. Operation and supervision section is mainly for work like platform operation mechanism, research of the evaluation system, management of the platform qualification process, checking and supervision and the assessment of the operation and service situation

Different organizations of the Science and Technology Foundation Platform are cooperative and complementary to each other. It makes full use of the roles of vertical organization structure in guiding, controlling and supervision as well as the advantages of horizontal organization in cooperation and resources sharing to realize the clear division of labors and close cooperation among internal organization structure, which is the indispensable organizational guarantee for the successful and effective operation of Science and Technology Foundation Platform.

4 Safeguard Measures of Our Science and Technology Foundation Platform's Operation

4.1 Form the advantage of innovation by integrating the resources

The government should act as a leader to organize and integrate all sorts of technological resources sticking to the principle of advantages complementing each other with their respective advantages, sharing benefits. The government should encourage and guide the integration based on resources of current enterprises, research institutions, universities and other science and technology foundation in society so as to develop a system that scientific achievements of research, education and enterprises can be closely combined. It should also encourage scientific research institutions, tertiary schools and enterprises to establish coordinating system for the application of bilateral or multilateral scientific conditions. It should also encourage technologists to move among universities, scientific research institutions and enterprises to form a stable scientific talents team. If the scientific resources can be integrated and certain amount of scientific resource sharing centers can be established, we can solve the

problem generally that the scientific resources are separated and distributed sparsely with unbalanced development. Therefore, we can promote the rational distribution and effective usage of the science and technology resources as well as the comprehensive force and efficiency of our innovation in science and technology.

4.2 Establish the communion system, construct a society of sharing

Establish a sharing system. In the process of constructing science and technology foundation platform, firstly we should break the dispersed resources, divided departments and institution monopolization. We should make integrated planning and coordination to the current scientific and technologic resources. Meanwhile, applying information management to resources is also an effective method to realize resource sharing and effective application. Hence, we should enhance the construction of coordinating common user network in seven regions of our country, perfecting the information system of this network, and publish timely the distribution as well as the usage of science and technology foundation resource. Secondly, we should take science and technology resources into standardization, internalization and legalization. The successful experience of ensuring the science and technology resources sharing by laws and regulations in developed countries has set up great examples which we should follow. Relative institutions should implement policies and regulations and unified criterion to guarantee the realization of sharing science and technology. At the same time, they should organize and coordinate communication and cooperation of science and technology resources. Finally, we should bring in the market system and put flexible sharing modes into practice according to the features of science and technology resources.

Strengthen publicity and construct a society of sharing. The construction of science and technology foundation platform is not only the task of the government and the department of science and technology, but also a social project that every citizen should participate and it requires various methods to enhance publicizing the sharing of the resources. We can display the function of the platform and sharing method through popularization of science and network. The achievements and benefit of sharing science and technology and more opportunities created for the public to experience science and technology foundation platform will enable members of society to fully aware the significance of platform construction and the necessity of sharing science and technology resources. Thus, we will improve the awareness of sharing the resources among the whole society. Meanwhile, we can establish reward and punishment system based on performance examination to commend managerial units where the result of sharing proves to be fine and staff who have contributed a lot. This will promote the enthusiasm of sharing science and technology resources of the whole society and build a social atmosphere beneficial for sharing the science and technology resources.

4.3 Strengthen the financial investment

Enlarge the finance investment to the science and technology foundation platform, and strengthen the financial security. The construction and operation of the science and technology platform need the support of the state, which is the main channel for the science and technology foundation platform. Base on the existing Infrastructure of special funds, Central and local governments need to arrange the funding to the platform building, increase the investment and the management of the funding, Implement the finance and the channel of the Science and Technology Platform. Related the daily operation, maintenance and updating of funds into the national budget for recurrent expenditure, ensure continuous stable investment basis in the field.

Optimize the structure of the technology, and strengthen the system planning. According to the requirements of public expenditure, gradually adjust the structure of the expenditures for science and technology, increase the fund on building basic technology condition and move the focus from the plan project to basic technology condition building. Meanwhile, enhance the platform integration and harmonization of funding allocation, gradually put the fund of Science and Technology Platform to platform construction, clear the project budget, reduce duplication and improve awareness of resource sharing.

Strengthen the guidance role of finance, encourage multiple investments, and expand the channels of funds. Make full use of the leading role of the governmental financial investment, while at the same time establish and complete the incentive mechanism, formulate unified standard and encouraging policies, attract social organizations, enterprises, individuals and foreign investors' funds investment through the market mechanism and the guidance of finance, and set up the sharing conditions platform together. Meanwhile, the use of the platform construction funds should be unified planned. While arrange the construction funds, we should confirm the plans and channels of the funds operation, and

fulfill its supervision and evaluation mechanism to form a multi-level and multi-channel society platform construction pattern.

4.4 Strengthen talents construction, provide talents support

Establish the reasonable talents evaluation and incentive mechanism. The orderly operation of Science and Technology Foundation Platform and talents management objectively require a policy environment that emphasizes the talents and ascertains the importance of them in the platform. Through the reform of the talents evaluation and incentive mechanism, establish talents evaluation standards that conform to the science and technology fundamental conditions, realize the impartial evaluation on the platform staff, and carry out the policy preferences in the salaries and welfares, to attract and retain various talents engaging in its constructions and services, building a fine environment of attracting, using and keeping the talents in order to provide powerful talents support for the regular operation of the platform.

Strengthen the talent cultivation, and improve the team quality. Science and Technology Foundation Platform need a high-level professional management staff and technical staff, which require bringing the cultivation of the professional management talents and technical talents into the plan of all kinds of talents cultivation. Combine the degree-level education with the on-the-job training, set up related professional disciplines, cultivate high-qualified talents, and train the platform staff. Meanwhile, attach importance to talents introduction and fascinate excellent talents engaging in the work to form a high-qualified, professional team in its management and technical support.

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