

# Research on the Construction of Financing Platform for Technology-Based smes Based on Big Data

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**Abstract:** *Science and technology smes have grown into the most dynamic and innovative groups, is an important force to promote the high-quality development of China's economy. However, due to its own characteristics, has been facing the difficult financing, financing expensive dilemma. Big data technology provides a new solution for the construction of technological financial platform. This paper analyzes the current situation and characteristics of the construction of science and technology finance platform, discusses the construction principles and basic framework of the financing platform of science and technology smes based on big data, and puts forward policy suggestions to promote the construction of the financing platform of science and technology smes.*

**Keywords:** *technology-based smes, financing platform, big data*

## 1. Introduction

Small and medium-sized technology-based enterprises are usually characterized by high risk, light asset and imperfect internal structure, so they lack effective financing operation mode and traditional financial institutions such as banks cannot bring sufficient financial support for them. In view of their own characteristics, small and medium-sized technology-based enterprises often need to invest a lot of money in research and development at the initial stage of establishment, and then face the industrial transformation of high-tech achievements after the achievement, resulting in huge costs. In the process of operation and development of technology-based smes, there is a long-term mismatch between capital supply and demand. Existing data show that 70% of the new capital sources of technology-based smes mainly come from their own accumulation, and the proportion of technology-based smes lacking financial support in their development process is as high as 90%. Financing problem has increasingly become a bottleneck restricting the sustainable development of technology-based smes.

In the era of big data, with the development of the Internet industry, the Internet Finance (ITFIN) model came into being. Science and technology, the establishment of financial platform to provide more comprehensive services for small and mid-sized enterprise, science and technology are optimized by the integration of financial resources, can realize information resources sharing, investment and financing the effective docking, overcome the problem of parties information asymmetry, significantly reduce the investment and financing cost, and increasingly become a new way to resolve this kind of enterprise financing difficulties. The technology finance platform integrates investment and financing relationship, database sharing, comprehensive services and regulatory functions. It can not only break the asymmetry of time, space and information, but also expand the scope of investors and improve capital efficiency to a certain extent, which is conducive to alleviating the financing dilemma faced by small and medium-sized technology-based enterprises.

## 2. Current Situation and Existing Problems OF Financing Platform Construction of Technology-Based Smes

### 2.1. Current Situation of Financing Platform Construction for Technology-Based Smes

With the implementation of the S&T innovation strategy, the People's Bank of China and other relevant departments have introduced a number of measures to promote the development of S&T innovation. Shenzhen, Shanghai, Jiangsu and other regions have carried out pilot projects to combine science and technology with finance, and established a number of S&T and finance platforms, which have promoted the effective connection between S&T enterprises and financial institutions. As China's

technology finance platform started late and is still in the exploratory stage, the construction of financing platform mainly focuses on the preliminary exploration of operation mechanism, functional positioning and structural mode.

At present, the operation of sci-tech financial platforms can be divided into three modes: first, government-led. In other words, the government plays a leading role in resource allocation, and is mainly responsible for building cooperation platforms, guiding capital participation, improving information channels, and realizing all-round monitoring. For example, tianjin, Jiangsu, Shenzhen and other local governments jointly set up science and technology financial service centers with high-tech zones. Second, financial institutions are dominant. In other words, the technology finance platform is completely set up and commercialized by financial institutions, and sustainable development can be achieved through profitable enterprise support. For example, the technology and finance service platform pioneered by Shanghai Pudong Development Bank realizes the precise connection between technology and finance by starting from technology enterprises and investors and relying on high-quality professional services and rich platform resources. Third, co-construction and sharing. Connect the main body of supply and demand, and build a comprehensive sharing service platform through information review, intermediary service and guarantee platform information service. This model has high transparency, is no longer limited to one party's dominance, can efficiently serve the local technology enterprises, in line with the trend of future development.

## ***2.2. Problems Existing in the Construction of Financing Platform for Technology-Based Smes***

### ***2.2.1. Asymmetric Information of Investment and Financing Parties***

The amount of enterprise information carried by sci-tech finance platform is not proportional to the number of sci-tech smes. Related websites can only be used as auxiliary tools to assist the development of technology-based smes, but can not become a bridge of communication between technology-based smes and potential investors, and there is serious information asymmetry between investment and financing parties. For investors, there is a lack of channels to understand small and medium-sized technology-based enterprises, unable to obtain the details of the target enterprises; For small and medium-sized technology-based enterprises, lack of information about potential investors, unable to actively contact with the investment enterprises, information asymmetry is the biggest obstacle to the financing of small and medium-sized technology-based enterprises.

### ***2.2.2. Unclear Positioning of Platform Functions***

On the one hand, tech finance platforms lack clear investment objects and are used to roughly define all tech enterprises as service objects. As different types of technology-based smes have great differences in capital demand, credit mortgage and other aspects, financing platforms can not solve the financing problems of enterprises. On the other hand, the functions of financing platforms are not clear, and technology-based smes generally face problems such as difficulties in information disclosure, lack of universally recognized credit evaluation system, and insufficient ability to understand policies. Therefore, many platforms have broad positioning, hoping to solve all problems for technology-based smes. However, in the actual operation, resources often can not take into account at the same time, can not solve the actual problems faced in the process of enterprise financing. Therefore, due to the difference of platform aggregation resources, the function positioning should be specifically differentiated.

### ***2.2.3. Weak Platform Sustainability***

Around because of the push of the policy and market demand, gradually set up a series of financial platform of science and technology, yet many platform after the completion of application, to update the basic stagnant phase of data information, and even a few areas of financing platform finally go away because of unable to long-term operation, platform survival period is short, can't play a role of expectations.

## **3. Construction of Financing Platform for Technology-Based Smes Based on Big Data**

### ***3.1. Basic Principles of Financing Platform Construction***

(1) Ensure information security

Different from other financing platforms, the construction of sme financing platforms involves the

development status, investment and financing needs, science and technology projects, talent pool and other data information of science and technology enterprises, involving science and technology administrative departments, enterprises, financial institutions and other stakeholders. In order to prevent the spread and improper use of enterprise information, The management and collection of data has high security requirements, requiring professional institutions with scientific research management service background to undertake management work, to provide guarantee for enterprise information security.

(2) Standardize information services

Through the financing platform management agencies in science and technology project management, evaluation of scientific and technological achievements, science and technology innovation strategy and policy studies, business accumulation, in the information data collection, verification and analysis of mining to take advantage of experience, brought together the basis of information of science and technology enterprises, scientific research projects, ensure sustainable information resource concentration, data collection, To provide standardized information services for small and medium-sized enterprises, financial institutions and government departments.

(3) Efficient connection of information

With the introduction of science and technology enterprises and financial intermediaries, explore establishing long-term effective docking mechanism, breaking the information resources dispersed closed state, so as to realize the benign development of resource sharing, Internet interaction mechanism, avoid vacancy information resources, reduce the information barriers of market participants, improving the utilization ratio of data information, realize the adequacy of data sharing.

### **3.2. Participants of the Platform**

According to the analysis of the demand side, the supply side and the third party elements of the financing platform, the participants of the financing platform mainly include the government, small and medium-sized technology-based enterprises, investors and the third party service institutions.

(1)The government

The government is a special participant of the financing platform of technology-based smes. As the initiator and supervisor of the platform, on the one hand, it should guarantee the normal operation of the platform, and on the other hand, it should be responsible for supervising the behaviors of platform participants and the legality and standardization of the platform operation process. In addition, the government is also the provider of policy information, news reports and other demand services, the demander of scientific research funds can be solved by issuing national bonds, and the third party that builds a bridge between small and medium-sized enterprises and investors in science and technology.

(2)Technology-based smes

Technology-based smes are the main demand side of financing platform. At different stages of development, enterprises obtain the required capital, knowledge, talent, technology and other resources through the platform, establish direct contact with investors, and obtain financial support from investors through roadshows and other ways to solve financing problems.

(3)The investor

Investors are the main suppliers of the financing platform and provide rich financing resources for small and medium-sized technology-based enterprises. Investors here are not only limited to traditional investment institutions such as banks, bond investment, venture capital, guarantee institutions and insurance institutions, but also include industry associations, private equity, crowd funding, review institutions of science and technology credit projects, government-led investment institutions or enterprises, science and technology capital market and individual investors. Expanding the scope of investment can make full use of financing resources and provide more abundant investment funds for small and medium-sized technology-based enterprises.

(4) Third-party service providers

Since most small and mid-sized enterprise does not have the complete internal governance structure, the third party service agencies as the financing service platform of the link, on the one hand can provide financial, legal, for small and mid-sized enterprise strategy consulting, human resources, intellectual property rights and related services, solve the problems in the enterprise in the development

process. On the other hand, the news reports, policies and regulations and other relevant information released by third-party services on the platform can help enterprises keep abreast of the latest policies of science and technology finance. In addition, third-party service agencies can also provide successful financing cases and industry reports for technology-based smes according to the statistics of the platform database, so as to help enterprises understand the current situation of the industry and adjust their business strategies.

### **3.3. Basic Framework of Platform Construction**

Combined with the characteristics of technology-based smes and the construction needs of financing information service platform, the platform system construction is mainly divided into portal website and database system in order to improve information transparency and the docking efficiency of enterprises and institutions:

(1) Portal websites. Announced major financial institutions and government departments and other preferential policies, investment and financing requirements of small and mid-sized enterprise and financial products, including the display industry information, policy information, and combining with the financing case, provide policy interpretation, case interpretation, investment and financing institutions list, list of science and technology enterprises, intermediary service institutions and project information database information, etc.

(2) Database system. The database system includes two parts, financial institutions and product information, and small and medium-sized enterprises information, with three functions of data collection, analysis and display. Enterprises registered membership of platform, to provide real and effective data, including company profile, financial position, credit qualification in nearly three years, the scientific research conditions, technology patent information and the information such as financing needs, through the platform staff after audit, collected into the database system, to provide warehousing, government regulators and other financial institutions. At the same time, the big data analysis technology is used to make comparative analysis of the whole data information, helping financial institutions to grasp the market situation in time, make reasonable investment planning, and provide reference for government regulatory departments to make relevant policies.

The establishment of database base should rely on traditional financial institutions to realize data sharing. Although existing financing platforms are rich in data resources, these data sources are mainly from social networks and lack authenticity due to unstructured information. Traditional financial institutions have accumulated rich customer data, including corporate finance, qualification and other information. Through the integration of data resources from both sides, and the addition of government departments and tax related information, the data system will be more perfect. The financing platform supported by big data closely links technology-based smes, governments and financial institutions to form a complete system. Investment and financing information, credit information, professionals, policy information, etc., can be exchanged and exchanged in the system. The whole platform constitutes a systematic environment with full flow of all resource elements.

## **4. Policy Suggestions on the Construction of Financing Platform for Small and Medium-Sized Technology-Based Enterprises**

### **4.1. A Guarantee Mechanism for Platform Operation Shall Be Established Under the Leadership of the Government**

In the operation of the financing platform, the government should not only act as the publisher of the main public data, but more importantly, establish an adequate guarantee mechanism according to the characteristics of big data, so as to ensure that the relevant subjects in the financing platform will not suffer illegal infringement of their own interests due to the release of data. This guarantee mechanism needs to be implemented through policies and regulations, so the government is bound to become its main supplier. In order to ensure the smooth operation of the platform, the government should introduce laws and regulations related to the maintenance and operation of the platform as soon as possible to ensure data security and optimize the operating environment of the platform. The establishment and use of the platform have changed the government's functions from direct intervention in front of the stage, such as tax reduction and exemption for enterprises and policy fund support, to capital and legal protection behind the scenes.

#### ***4.2. Build a Platform Auxiliary Guarantee System with the Help of Specialized Intermediary Structure***

In view of the particularity of small and medium-sized technology-based enterprises, in the long-term operation of the platform, professional intermediary agencies become an indispensable subject in order to promote the effective connection between capital supply and demand. During the operation of the platform, a group of qualified professional intermediary institutions can be selected, such as legal professional institutions, intellectual property appraisal institutions, asset appraisal institutions, accounting firms, credit rating agencies and information technology analysis institutions, etc., to establish the platform auxiliary guarantee system. At the same time, explore the establishment of a coordination mechanism for professional intermediary agencies, and clearly define the positioning, functions and participation forms of various agencies in the operation of the platform.

#### ***4.3. Establish a Technology and Talent Guarantee Mechanism for Financing Platforms***

Big data technology and talents are the core guarantee for the construction of financing information platform. It is necessary to attach importance to the development and application of big data technology and develop information database with strong applicability. Accelerate the cultivation of high-tech talent, actively advance the construction of production-study-research cooperation alliance, exert the linkage, guide the scientific research institutes, institutions such as colleges and universities attach importance to the applications of big data, as well as large data talents cultivation, and the credit reporting company cooperation, for small and mid-sized enterprise financing platform construction transportation talents, relying on big data technology, constantly promote and optimize the platform to build.

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