

# Research on Innovation Practice Platform Construction and practice path of automotive Specialty

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**Abstract:** This paper first analyzes the necessity and significance of the construction of the innovation practice platform for automobile majors, and analyzes five models of the innovation practice platform and their respective application scope according to the level of technology maturity. On this basis, it proposes that the operation of the innovation practice platform needs to strengthen the construction of mechanism, operation, talent and achievement. Then it puts forward that the innovation practice platform needs to achieve the expected results, and finally puts forward the existing problems and adopted countermeasures and suggestions.

**Keywords:** Innovation practice, Automobile industry; Platform construction; Practice verification.

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## 1. Concept and function of innovation practice platform

Science and technology innovation platform is an important carrier to optimize and integrate science and technology resources to carry out science and technology innovation activities and promote science and technology achievements, as well as the main carrier of independent science and technology innovation capacity construction [1]. With the continuous improvement of enterprise science and technology development, how to make better use of domestic and foreign science and technology talent resources, further improve innovation ability and solve the existing science and technology problems has become an important direction of enterprise development. In recent years, the construction of science and technology innovation platform has become a new way for enterprises to promote the development of science and technology. At present, many Chinese enterprises have cooperated with universities and scientific research institutions to establish scientific and technological innovation platforms, give full play to their resource advantages, expand cooperation modes, collaborate on key problems, and guide different innovation factors to gather with the goal as the guide, which promotes enterprises to stride towards the medium and high end.

However, there are some problems in the governance of technological innovation platform. On the one hand, the lack of systematic planning in the initial stage of the establishment of the scientific and technological innovation platform leads to the inaccurate positioning of the platform and the duplication of functions, resulting in the waste of resources. On the other hand, some scientific and technological innovation platforms are subject to the system and mechanism of enterprises, which attach importance to production but despise scientific research, resulting in the platform becoming a mere formality and failing to truly assume the responsibility of scientific and technological innovation. Therefore, it is of great significance to study how to promote the construction of scientific and technological innovation platform and explore the experience and practice of innovative manufacturing enterprises in this respect.

Scientific and technological innovation platform is a

concept that has not been clearly defined by the academic world, but a variety of definitions have appeared in the research of domestic scholars. For example, Huang Ningsheng believes that science and technology innovation platform is the carrier of optimizing and integrating science and technology resources, promoting scientific and technological achievements, and is also the main carrier of independent science and technology innovation capacity construction. However, Zhu Xinghua believes that the construction of science and technology platform includes three types: public science and technology infrastructure platform, industry professional innovation platform and regional innovation platform. In addition, Su Yuecheng and Xu Jianbo believe that science and technology innovation platform is a new, cross-over and important operation mode of scientific research organization, which integrates discipline construction, talent construction and science and technology development, and realizes the full sharing of knowledge, talent and resources.

In China, the government, institutions of higher learning, research institutes and enterprises are the four major forces promoting the system of scientific and technological innovation. The establishment of scientific and technological innovation platform is one of the most effective measures at present. Science and technology innovation platform can bring together various innovation elements, coordinate innovation links, provide innovative service support, mobilize the enthusiasm of innovative talents, and finally create a good atmosphere for innovation. For innovative manufacturing enterprises, technological innovation platform mainly plays an important role in the following four aspects.

The first is resource integration, bringing together innovative elements and enhancing the close combination of industry, university, research and application. Science and technology innovation platform can maximize the use of the partner's unique superior resources, make up for the shortcomings of the enterprise itself, promote the development of science and technology of both sides, so as to achieve win-win cooperation. We will strengthen knowledge sharing, attract more partners by opening resource information on all platforms, and promote the construction of an enterprise science and technology innovation system.

The second is coordination and guidance, guiding the

internal and external parties to collaborate on innovation. Science and technology innovation platform can play a connecting and regulating role in the innovation work. Through the use of various preferential policies, the maximum utilization of integrated resources can be judged and implemented to improve the efficiency of enterprise science and technology innovation.

The third is to reduce risks. Scientific and technological innovation is a high-risk activity. The establishment of technological innovation platform provides guarantee and support for technological improvement of enterprises, makes technological innovation have rules to follow, and promotes the standardization, normalization and institutionalization of enterprise innovation work.

The last is the incentive function. The establishment of the innovation platform can stimulate the vitality of scientific and technological innovation, improve the efficiency of scientific and technological innovation, and enhance the effect of scientific and technological innovation. Relying on the external experienced team, can accelerate the enterprise's internal professional personnel training.

## 2. Innovation Practice platform model in automobile industry

In recent years, innovative manufacturing enterprises have become one of the main directions of manufacturing transformation. Such enterprises usually set up an independent technology research and development department, as well as a complete scientific research support department, to provide technical and condition guarantee.

Compared with traditional manufacturing enterprises, innovation-oriented enterprises pay more attention to scientific and technological innovation. By strengthening foreign cooperation, building scientific and technological innovation platform, improving scientific and technological innovation system and other measures, they strengthen pre-research and technological development, and promote the transformation and industrialization of scientific and technological achievements.

Technology innovation platform is an important part of innovative manufacturing enterprises. It is usually established under the leadership of enterprises or governments, and has various functions such as technology research and development, technology transfer, test verification, resource sharing and enterprise incubation, so as to improve the industry-university-research-use collaborative innovation mechanism and enhance the R&D and innovation ability of enterprises. According to different classification methods, science and technology innovation platforms can be classified by industrialization process, function, regional level, relying on the main body and other aspects.

This paper proposes a classification method based on technology maturity level. Based on the characteristics and development requirements of innovation-oriented manufacturing enterprises, it is suggested to set up multiple technology innovation platforms in enterprises and classify them according to technology maturity level. This theoretical model, as shown in Table 1, can improve the level of R&D and innovation of enterprises and has important strategic significance for the development of enterprises. It is shown in Table 1.

**Table 1.** Classification of technology innovation platforms based on technology maturity

Technology maturity level	Content of scientific and technological innovation	Scientific and technological innovation platform	Specific work
(Level 1~9) technical whole process	Whole process management	Engineering technology research center, technology innovation center	The whole process of scientific and technological innovation
(Level 1~2) basic research stage	Prestudy	Academician expert workstation, research branch	Project declaration and implementation
(Level 3~4) laboratory stage	Test verification	Joint construction of laboratory	Experimental research and trial production
(Level 5~7) engineering stage	Achievement transformation	Technical verification center	Technology introduction and application of results
(Level 8~9) industrialization stage	Technology extension	Technology incubator	Technology promotion and incubation application

Science and technology innovation platform can be divided into five types [1]. The first is the technology whole-process construction platform, covering the technology maturity level 1-9, such as the national engineering technology research center and technology innovation center approved by the government. These platforms are high-level research and development institutions of enterprises, mainly providing support for technological progress and scientific research and innovation of enterprises, through the whole process of research and development, pilot test, verification, achievement transformation and industrialization. In addition, the platform will explore new innovation management systems for enterprises and promote reform of scientific research systems and mechanisms.

The second type is the R&D platform, covering the technology maturity level 1-2, such as academician expert workstation and research branch jointly built by joint research institutes and universities. Through cooperation with relevant

research institutes and universities, advance research on scientific and technological issues, enhance the ability of independent innovation, and promote industry-university-research-use cooperation and technological innovation.

The third type is the test platform, which covers the technology maturity level 3-4, such as the test platform jointly built by the relevant scientific research and experiment units and testing institutions. The platform mainly aims at the research results and the basic tests needed to be carried out during the research process, jointly carrying out the related work of test and trial production, promoting the pre-research and output of scientific research results.

The fourth is the achievement transformation platform, covering technology maturity level 5-7, such as technology transfer platforms such as scientific and technological achievements demonstration and verification center. The platform is mainly used to accelerate the introduction and transformation of scientific and technological achievements

of universities and research institutes, and realize the technology export of research institutes and technology introduction of enterprises.

The fifth type is industrialization platform, covering technology maturity level 8-9, such as technology incubator for incubating high-tech projects and other technology incubation platforms. Through this platform, high and new technologies can be exported and applied, and the economic and social effects of innovation resources can be realized.

These different types of scientific and technological innovation platforms promote and restrict each other, jointly promote the independent innovation of various technologies of enterprises and the establishment of a scientific and technological innovation system combining "production, university, research and application", and strive to enhance the R&D and innovation capabilities of enterprises.

### 3. Analysis on the operation mode of science and technology innovation Platform

In order to build an enterprise into a scientific and technological innovation brand project, enterprises need to establish a scientific and technological innovation platform based on high positioning, high standards and high requirements. However, the operation mode of the technology innovation platform is crucial to its function. In order to deepen and promote the specific work of the science and technology innovation platform, strengthen the deep cooperation with the cooperation units, provide a strong guarantee for the construction of each platform, and promote the formation and promotion of the core competence of the enterprise, it is necessary to explore the operation ideas of the science and technology innovation platform.

The operating model of science and technology innovation platform has four elements. First of all, it is necessary to build the working system and mechanism to ensure the efficiency and smoothness of the platform operation. Secondly, the construction of operation guarantee should be done well, including the allocation and guarantee of material facilities and human resources. Thirdly, it is necessary to strengthen the construction of talents, recruit and cultivate talents with innovative ability and practical experience, and provide strong support for the development of the platform. Finally, it improves the construction of achievements, actively promotes and applies the scientific and technological achievements of the platform, and promotes the improvement and sustainable development of the core competence of the enterprise. It is shown in Figure 1.

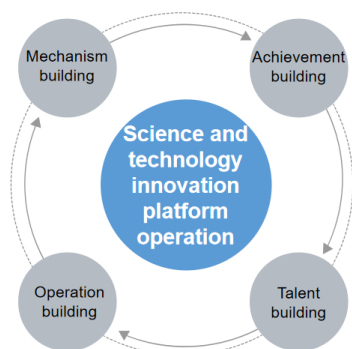


Figure 1. Operation model of science and technology innovation platform

### 3.1. Strengthening work mechanism building

In order to strengthen the construction of the working mechanism of scientific and technological innovation platform, enterprises need to innovate the system and mechanism, and improve the relevant management methods. Enterprises may formulate relevant systems such as the Measures for the Management of Scientific and Technological Innovation Platforms and establish rules and regulations to ensure that the construction of scientific and technological innovation platforms has rules to follow and that scientific research and innovation are not restricted by the production system. In addition, enterprises need to establish a stable cooperation mechanism, according to different forms of cooperation (consulting, technology research, achievement transformation, personnel training, academic exchange, etc.), signed framework cooperation agreements and technical service contracts with the other side. In the process of cooperation, the fields and directions of cooperation, work content, resource security, contract amount, rights and interests of both parties, intellectual property rights, confidentiality and other contents shall be defined.

At the same time, enterprises should establish regular meeting mechanism of science and technology innovation, regularly check the progress of science and technology innovation tasks, exchange experience in science and technology innovation work, coordinate and solve the problems in science and technology innovation work, especially in the work mechanism and system, and make arrangements for the main tasks in the development of enterprise science and technology innovation work. In this way, the rapid development of scientific and technological innovation platform can be promoted, the deep cooperation with cooperative units can be strengthened, the scientific and technological innovation ability of enterprises can be enhanced, and the sustainable development of enterprises can be provided with strong support.

### 3.2. Strengthen operation construction

In order to guarantee the operation and development of the science and technology innovation platform, the security system needs to be developed from the following aspects. First of all, the responsible person management system and professional technical team should be established to promote the work responsibility system, and the professional technical team should be set up, covering the aspects of technology, industry, project management, investment and entrepreneurship guidance, so as to make up for the shortcomings of the technical team. Secondly, scientific research projects should be defined and problem solving should be emphasized. The professional research direction of the innovation platform and the professional needs of each research team should be sorted out according to the core business, and specific research direction and research tasks should be regularly formulated, and the existing projects of the enterprise should be solved by the innovation platform team. Third, to formulate work plans, establish the whole process planning management system of the scientific research system, unify the management platform construction and cooperation needs, formulate annual work plans and assign special personnel for control and management, so as to truly achieve the control of the whole process planning. Fourthly, special operating funds shall be set up to provide stable and sustainable support for the daily operation, attraction, incentive and service platform construction of the

platform, and at the same time guarantee the scientific and rational use of funds for scientific research projects. Finally, give full play to the role of laboratory, relying on enterprise laboratory and technical personnel, allocate relevant laboratory and test conditions for the science and technology innovation platform, realize the full opening of laboratory to test verification capacity resources, and strengthen the construction of basic conditions, to provide necessary workplace and life service guarantee for each platform team.

### **3.3. Strengthen the construction of talents**

In order to build a high-level platform for scientific and technological innovation, it is necessary to build a strong talent team and attract a group of leaders in technology research and development. Through the implementation of talent development projects, combined with the project to cultivate talents, joint training of a group of high-level talents. In the process of project practice and achievement transformation, through various practical training channels such as the introduction of cooperation teams to help and cultivate, the platform is equipped with team members' guidance, and the dispatch of employees to study in cooperation units, the growth of enterprise backbone talents and the establishment of scientific research team and ability improvement are accelerated.

It is also necessary to explore and implement the correlation between the contribution degree of outstanding talents and incentive policies, formulate positive policies and measures such as performance incentive, development incentive and honor incentive, and establish a talent evaluation system oriented by innovation ability, quality and contribution, so as to attract and retain core talents, gather collective wisdom, and stimulate and release the innovation and creativity of talents to the maximum extent. Finally, we will maximize the value of high-end talents and leading talents, lay a solid foundation for promoting the improvement of technical capabilities, and improve the mechanism of talent construction and flow.

### **3.4. Strengthen result-building**

We will focus on promoting the commercialization of scientific and technological achievements and building platforms for the commercialization of diverse achievements. Relying on the demonstration center and the technology transfer center, we will build a platform for the transformation of scientific and technological achievements, promote the rapid transformation of relevant scientific and technological achievements into the productivity of enterprises, and open up the "last mile" of the transformation of achievements.

We should improve the layout of scientific and technological achievements, systematically sort out the scientific and technological achievements of enterprises by relying on the scientific and technological innovation platform, plan the layout of scientific and technological achievements of enterprises according to the correlation of achievements, and build scientific and technological achievements group. In addition, we should also help enterprises to condense the highlights of scientific and technological innovation, laying the foundation for enterprises to apply for high-level scientific and technological awards.

The incentive mechanism for scientific and technological achievements should be improved. Enterprises should first verify and use scientific and technological achievements

generated by the scientific and technological innovation platform, and give certain economic rewards to the innovation platform for the benefits generated by the transformation and application of scientific and technological achievements to the production site or the transfer of intellectual property rights according to the principles of benefit sharing and one case one discussion.

Strengthen the awareness of intellectual property rights and do a good job in intellectual property protection. Science and technology innovation platform is knowledge-intensive platform, whose main capital is intellectual property rights. Strengthen the management ability based on the dual core of intellectual property and patent strength, avoid intellectual property risks, reduce intellectual property disputes, and enhance the market competitiveness of enterprises.

## **4. Expected results of the construction of the platform for scientific and technological Innovation**

In the early stage of the construction of science and technology platforms, we should follow the basic principles of "demand-based, project-oriented, enterprise-oriented, result-oriented", and guided by the concept of "effective, pioneering and innovative", focus on the front line of production, and give full play to the role of science and technology innovation platforms as the "strongest brain" of enterprises. By building various scientific and technological platforms, we will promote the source of scientific and technological innovation, the gathering pool of high-level leading talents and technologies, and the siphon station of high-end technologies, so as to comprehensively promote the technological upgrading of enterprises. Continuous construction will mainly achieve the following results.

First, it can promote the development of production and enterprise construction. Each innovation platform will aim at production and development, solve on-site problems and outstanding problems, to be the "terminator" of production technical problems. By focusing on the improvement of the core competence of the enterprise and strengthening the construction of professional capacity, we will become the "chief of staff" for the improvement of professional and technical ability. And relying on the influence of the science and technology innovation platform, attract, attract talent and wisdom, cultivate the national science and technology innovation platform and "ghost factory", to do the leapfrog development of each professional "booster".

Second, it should realize the combination of production, education, research and application and scientific and technological innovation. All innovation platforms will carry out scientific and technological innovation-related work, strengthen cooperation with co-construction units, cope with industrial changes caused by scientific and technological revolution, seize the commanding heights of global industrial technological innovation, break through key technological bottlenecks for the long-term development of various industries and industrial security, and play a strategic supporting and leading role in technological innovation in national key industrial fields [1].

Third, it should foster a sound environment for innovation and entrepreneurship and drive the industry. We should devote ourselves to "transforming scientific and technological achievements, implementing policies on scientific and technological innovation, and incubating scientific and

technological enterprises", build an industrial scientific and technological innovation and entrepreneurship system, constantly improve the innovation and entrepreneurship service network, push industries towards the medium-high end of the value chain, and gradually realize the convergence of innovation and industrial chains.

Fourth, it should stimulate the vitality of research platforms and the impetus for innovation. Through the construction and management of scientific and technological innovation platform, the construction and improvement of scientific and technological innovation system should be promoted, and the enterprise's product R&D and manufacturing capabilities should be formed and enhanced, so as to stimulate the innovation vitality of enterprises and promote the construction of higher level scientific and technological innovation teams and conditions.

## 5. Existing problems and countermeasures

Through the above analysis, although the construction of various scientific and technological innovation platforms can create a scientific research innovation system with comprehensive development of industry, university and research, orderly promote the improvement of scientific and technological innovation mechanism and system, and lay a solid foundation for enterprises to create a good atmosphere for scientific research, there are still some problems in the construction and operation process.

First of all, corporate executives have not reached an agreement on the understanding and planning of scientific and technological innovation platforms, which makes it difficult to implement some work. As the construction of a scientific and technological innovation platform in an enterprise is a systematic project, it needs the joint participation of science and technology, planning, law, scientific research, production and other departments. However, most manufacturing enterprises attach importance to production, and different departments have inconsistent understanding of the construction of various innovation platforms.

Secondly, the enterprise's research and development ability is not strong enough, and the operation model is not perfect. Many small businesses do not have a dedicated research and development department, or are small and low-level problems. At the beginning of the establishment of scientific and technological innovation platforms, some large enterprises are generally enthusiastic. However, in the actual construction process, due to various constraints, the progress is slow, and the enthusiasm will be strongly discouraged. All these phenomena are due to the lack of thinking about the operation mode of each platform in the early stage of construction, and the lack of supporting support for enterprises. As a result, the scientific and technological innovation platform has a slow effect, unclear goals and no effective play of its functions.

Finally, the various innovation platforms are not closely connected enough to complement each other. In recent years, in the operation and development of enterprises, there is a phenomenon of "emphasis on the two ends, light on the middle". For example, there is a misunderstanding of thinking and cognition in many enterprises that "doing research is to do research". As a result, various scientific and technological innovation platforms work independently and lack a bridge to communicate with each other. As a result, the pace of transformation of scientific and technological achievements

is relatively slow, which has become a bottleneck restricting enterprises' scientific research and innovation.

In view of the above problems, improvements can be made in the following aspects. First, enterprises need to consider their own needs comprehensively and establish a platform for scientific and technological innovation. Although the construction of science and technology innovation platform belongs to the work of science and technology line, it is difficult to push forward by relying only on the strength of science and technology and technology research and development department. Therefore, it is necessary to pool resources of all parties, strengthen consensus, make concerted efforts, fully mobilize the strength of all parties, and jointly promote the construction of the platform. At the same time, the construction objectives of each platform should be further clarified in combination with the urgent problems of enterprise capacity building and scientific and technological innovation. Starting from the attributes of the platform and the enterprise itself, targeted construction and promotion work should be strengthened to create a strong atmosphere for scientific research and innovation.

Secondly, it is necessary to further improve the mechanism and system of scientific research and innovation to provide a strong guarantee for the construction of the platform. Scientific and technological innovation platform is a new thing in the enterprise, and there are many differences with the traditional enterprise management. Therefore, it is necessary to further combine the status quo and development strategy of enterprises in scientific research, take the existing scientific research resources as the carrier, organize various research directions in combination with the scientific research work to be carried out, so as to open up the whole process of scientific research innovation, achievement transformation and technology application in an all-round way, and improve the scientific research system according to the needs of scientific and technological innovation platform construction.

Finally, it is necessary to strengthen the construction of the enterprise's scientific and technological cultural atmosphere and reverse the cognitive misunderstanding of technical personnel. It is necessary for technicians to have a deep understanding of the idea that "to promote the development of science and technology, it is fundamental to realize the circulation of technology throughout the process". At the same time, a communication group should be established to establish an irregular communication mechanism between various scientific and technological innovation platforms, and to promote the "last mile" of the transformation of scientific research results according to specific research directions and enterprise capacity building needs.

## 6. Conclusion

Science and technology innovation platform is an important tool to connect the internal science and technology innovation and cooperation units of manufacturing enterprises, which is of great significance to promote the transformation and industrial reform of manufacturing enterprises. In the construction of science and technology innovation platform, enterprises need to strengthen planning, clear positioning, strengthen resource allocation and coordination, and organize the application and construction of various science and technology innovation platform according to local conditions, so as to inject continuous innovation vitality for enterprises. In the operation and

construction of the science and technology innovation platform, timely adjustment should be made according to the actual situation of the enterprise, effective mechanism should be established around the target, operation guarantee should be done well, assessment and incentive should be strengthened, achievement cultivation should be emphasized, scientific and technological innovation work should be carried out in detail, and a virtuous cycle of transforming scientific and technological achievements into products should be promoted, so as to comprehensively improve the overall scientific and technological innovation strength of the enterprise. This can lead to product realization and technological innovation.

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