

Research On the Organization and Management of The Whole Process of Scientific and Technological Innovation in Major Railway Projects

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Abstract: The technological innovation of major railway projects has the characteristics of long cycle, large scale, high technological content, and significant economic and social benefits. This paper takes the scientific and technological innovation of major railway projects as the research object, analyzes the necessity of the organization and management of the entire process of scientific and technological innovation of major railway projects, and identifies the key elements of the organization and management of the entire process of scientific and technological innovation of railway major projects from the aspects of human, finance and material. The organization and management process of the whole process of scientific and technological innovation of major projects is divided into three stages: project declaration, project implementation, project acceptance and achievement management. Research is carried out on the entire process management of quality, the entire process of funding and the entire process of intellectual property management of major railway engineering scientific and technological innovation. It has certain reference value for standardizing the scientific and technological innovation organization and management mode of major railway projects, improving the efficiency of the allocation of scientific and technological innovation resource elements, and improving the level of refined management of scientific and technological innovation.

1. Introduction

Major railway projects refer to backbone railway projects that have a significant impact on the national economy and social development [1]. They have the characteristics of long project cycle, huge construction scale, high technology content, significant economic benefits, and far-reaching social impact. They are complex giant systems that integrates scientific theoretical research and core technology breakthroughs, technical resource integration and development and implementation, and engineering product development. Relying on major projects to carry out technological innovation has become a prominent feature of technological innovation in the railway industry [2-4]. In recent years, a large number of scientific and technological innovations based on major projects such as the Qinghai-Tibet Railway, the Beijing-Shanghai High-speed Railway, and the Beijing-Zhangjiakou High-speed Railway have provided strong technical support for the construction of our country's railway infrastructure. However, as the Sichuan-Tibet Railway, a strategic project of the century, is fully under construction, technological innovation in the railway industry is facing unprecedented challenges [5]. Therefore, it is urgent to carry out research on the organization and management mode of the entire process of scientific and technological innovation in major railway projects, in order to further standardize the organization and management of scientific and technological innovation in major projects, improve the efficiency of the allocation of scientific and technological innovation resources, and improve the level of refined management of scientific and technological innovation projects.

2. Analysis on the Necessity of the Organization and Management of the Whole Process of Scientific and Technological Innovation in Major Railway Projects

During the construction of major railway projects such as the Qinghai-Tibet Railway, the Beijing-Shanghai High-speed Railway, and the Beijing-Zhangjiakou High-speed Railway, China National Railway Group Co., Ltd. (formerly the Ministry of Railways and China Railway Corporation) has implemented various levels of management of scientific and technological innovation and has achieved fruitful technological achievements, and twice won the National Science and Technology Progress Special Award. However, in the process of scientific and technological innovation of major railway projects, there are still problems such as insufficient foresight in the establishment of scientific and technological innovation projects, non-standard fund management, and low achievement conversion rate, which are manifested in the following aspects:

2.1 Lack of foresight in the establishment of scientific and technological innovation projects

The lack of foresight of some scientific and technological innovation projects is not conducive to guiding the construction of major railway projects. It is mainly reflected in: first, there are few scientific and technological innovation achievements in major projects, and insufficient support for major key technical problems in some project construction; second, in the actual organization and management process, scientific and technological innovation projects often appear late, causing scientific and technological innovation to lag behind railways engineering construction; third, some major railway engineering scientific and technological innovation projects are not closely integrated with production practices, resulting in low-level repeated research in some projects, resulting in a waste of scientific and technological innovation resources.

2.2 Irregular management of scientific and technological innovation funds

The fund management of some scientific and technological innovation projects is not standardized, which is not conducive to the guarantee of funds. It is mainly reflected in: first, the lack of specialized financial personnel to regulate the management of scientific and technological innovation funds, leading to the disconnection of scientific and technological innovation funds; second, the lack of strict auditing of scientific and technological innovation funds, resulting in unreasonable scientific and technological innovation funds; third, the expenditure planning of scientific and technological innovation funds is not detailed, leading to slow progress in technological innovation or serious shortage of funds in the later period.

2.3 The conversion rate of scientific and technological innovation achievements is not high

Due to the lack of an effective achievement sharing mechanism and information platform, the transformation rate of scientific and technological innovation achievements of major railway projects is not high. It is mainly reflected in: first, the degree of integration of engineering construction and technological innovation is not high, and there is not a mechanism for sharing results between technological innovation department and the engineering construction department; second, the means of information and the network have not been fully utilized to build an achievement transformation platform, which is harmful to promotion and application of technological innovation.

The organization and management of the entire process of scientific and technological innovation of major railway projects refers to the management and control of the entire process of scientific and technological innovation projects of major railway projects, and the coordinated use of the internal resources and external environment of the railway industry. It is a multi-stage, uncertain and complex activity, in order to reduce the risks of technological innovation and ensure the successful completion of technological innovation projects. It can be seen that it is necessary and meaningful to organize and manage the entire process of scientific and technological innovation projects in major railway projects.

3. Analysis on the Organization and Management Process of the Whole Process of Scientific and Technological Innovation in Major Railway Projects

The organization and management process of the entire process of scientific and technological innovation in major railway projects can be divided into three stages. The first stage is the scientific and technological innovation application management. The scientific and technological innovation projects of major railway projects mainly originate from the actual problems of the construction and operation of major railway projects. The focus of organization and management at this stage is to clarify the objectives, content and requirements of scientific and technological innovation of major railway projects. The starting point for the organization and management of the entire process of scientific and technological innovation in major railway projects. The second stage is the implementation and management of scientific and technological innovation, including project initiation and project execution. It is the focus of the organization and management of the entire process of scientific and technological innovation in major railway projects. The third stage is the acceptance of scientific and technological innovation projects and achievement management. This is the final stage of the organization and management of the entire process of scientific and technological innovation in major railway projects, and is also the purpose of scientific and technological innovation in major railway projects.

3.1 The declaration management of scientific and technological innovation

Application management is the initial link of the organization and management of the entire process of scientific and technological innovation in major railway projects, and also is a prerequisite for the smooth development of scientific and technological innovation projects, and determines the development direction of scientific and technological innovation. In general, the declarations for major railway engineering scientific and technological innovation projects cover many aspects such as engineering survey, engineering construction, ecological protection, disaster prevention and rescue, operation and maintenance in major railway projects. In the application management stage, it is necessary to make a clear statement of the research objectives, project significance, technical route, task division, implementation plan, achievement expectations, safeguard measures and budgets. The scientific and technological innovation of major railway projects requires the establishment of a scientific and standardized declaration management system and the establishment of specialized technical personnel for declaration management to ensure the feasibility of major railway engineering scientific and technological innovation projects. Application management is to analyze and demonstrate scientific and technological innovation projects from the internal resources of the railway industry, external markets, technical capabilities, and social economy, to determine whether the scientific and technological innovation projects are feasible, or to select the best from many alternative plans. Application management should adhere to the principles of scientific, market-oriented and foreseeability, improving the cohesion and unity of the technological innovation of major railway projects from strategy to tactics and from conception to implementation.

3.2 The implementation management of scientific and technological innovation

The scientific and technological innovation implementation management process includes project establishment, project execution, etc. Correspondingly, relevant human resources, material resources, financial resources and other resources must be coordinated and dispatched to provide resource guarantee for the implementation of scientific and technological innovation. The implementation and management of scientific and technological innovation is composed of a series of systematic organization and management tasks.

(1) Project approval

The scientific and technological innovation of major railway projects should conduct feasibility demonstration of the project to determine whether the project can be approved. The scientific and technological innovation of major railway projects needs to analyze the feasibility and benefit of the project from the aspects of project requirements, existing technology, and research funds, and conduct

preliminary screening. For scientific and technological innovation projects with R&D value, it is decided whether to initiate the project according to the scientific and technological innovation development strategy of major railway projects, the research and development strength, the possibility of project realization, and the social and economic benefits of the project results. Project initiation is the embodiment of project declaration management, and it is a written document for the establishment of the project declaration. When establishing scientific and technological innovation projects for major railway projects, it should be noted that the law of scientific and technological innovation development, and the actual operation of major railway projects must be followed in order to improve the possibility of achieving scientific and technological innovation in major railway projects.

(2) Project implementation

During the execution stage of major railway engineering scientific and technological innovation projects, a reasonable operation plan must first be designed according to scientific and technological innovation projects. Scientific and technological innovation personnel carry out project research and development in accordance with the operation plan, carry out research on key technologies, and conduct theoretical research, simulation calculations, and experimental verification. In this stage, it is the task to develop new products, processes, and equipment with engineering practical value, and it is related to the success of scientific and technological innovation. In the process of project implementation, the personnel of the organization and management of scientific and technological innovation should pay attention to the progress of the project, do a good job in the allocation of scientific and technological innovation resources, and accurately control technological risks. In the early stage of project implementation, it is necessary to actively track the progress of the project; in the middle of the project implementation, it is important to do the mid-term assessment; in the later stage of the project, it is necessary to organize and submit the results on time.

(3) The acceptance and achievement management of scientific and technological innovation

The project acceptance stage is the last step in the implementation of scientific and technological innovation in major railway projects, and it is also a key link to ensure the quality of scientific and technological innovation. This stage mainly inspects the quality and feasibility of scientific and technological innovation achievements. Through the process of project acceptance, it is possible to comprehensively inspect the quality of technological innovation. For the scientific and technological innovation achievements that have passed the project acceptance, major railway projects should be applied to actual construction and operation as much as possible. Achievement management is an important part of scientific and technological innovation in major railway projects, and it has a powerful role in promoting the exchange, promotion and application of scientific and technological innovation achievements, and motivating the enthusiasm of the vast number of scientific and technological innovation personnel. The management of scientific and technological innovation achievements requires review and evaluation the achievements in accordance with prescribed forms and procedures. For scientific and technological innovations with strong practical value, it is necessary to actively promote the development of commercialization and even industrialization. Through the promotion and application in major railway projects, support the construction and operation of major railway projects, and promote the upgrading of railway equipment and the development of the industrial system.

In the process of scientific and technological innovation in major railway projects, there is no strict or uniform boundary for the division of various stages. There are overlapping and parallel activities in each stage. The operation effect of the previous stage will affect the development of the next stage and the operation of the next stage. Difficulties may also need to be fed back to the previous stage, which can be resolved in the previous stage of work. The stages are different and connected to each other, and unified as a whole. Problems in any link will affect the results of the project. Therefore, it is necessary to organize and manage the whole process of scientific and technological innovation.

4. Identification of Key Elements of Organizational Management in the Whole Process of Scientific and Technological Innovation in Major Railway Projects

Identifying the key elements of the organization and management of the entire process of scientific and technological innovation in major railway projects and rationally deploying element resources are the keys to the successful development of scientific and technological innovation in major railway projects. The main task of the identification of key elements is to integrate the resources of available inside and outside in the railway industry, providing strong support for the development of scientific and technological innovation in major railway projects. The type, quantity, quality and time of the key elements will have an important impact on the implementation of scientific and technological innovation. Therefore, it is very important to manage the key elements and make a plan for key element input and distribution. Discuss the key elements from three aspects: key elements of human resources, key elements of financial resources, and key elements of material resources.

4.1 Key elements of human resources

The scientific and technological innovation of major railway projects must carry out appropriate management of key elements of human resources and personnel deployment. A group of scientific and technological innovation talents can be recruited, introduced or cultivated to form a scientific and technological innovation talent team with relevant knowledge reserves or relevant experience in project research and development. In order to reduce the cost of personnel training in the railway industry, it can also cooperate with external scientific and technological innovation teams such as universities, scientific research institutes, and technological enterprises to enhance their own scientific and technological innovation capabilities and ensure the successful implementation of scientific and technological innovation in major railway projects. In addition, the management of key elements of human resources must scientifically divide the work of scientific and technological innovation personnel in major railway projects, and clarify the responsibilities of personnel in accordance with the scientific and technological innovation content of major railway projects. Achieve division of labor, cooperation, and orderly research and development to improve the research and development efficiency of scientific and technological innovation in major railway projects.

4.2 Key elements of financial resources

The key elements of the financial resources of major railway projects for scientific and technological innovation include three aspects: fund raising, use, and efficiency. In fund-raising management, major railway projects can use construction funds in a certain proportion to carry out scientific and technological innovation. Government support can also be used to actively strive for the National Natural Science Foundation, key research and development plans, and scientific research plans of provincial ministries and commissions to provide financial support for scientific and technological innovation in major railway projects. In addition, it can also raise funds in the external capital market, through bank loans, securities companies, trust companies, etc., to raise funds for scientific and technological innovation through multiple channels. In terms of capital use management, major railway projects must fully analyze the internal and external environment and project feasibility, make scientific decisions about whether to invest in scientific and technological innovation funds and the proportion of investment, strengthen the audit of funds in the process of project implementation, and control the use of scientific and technological innovation funds. In capital efficiency management, actively improve the use efficiency of scientific and technological innovation funds for major railway projects, save the use of scientific and technological innovation funds, produce scientific and technological innovation project results as soon as possible, actively promote the commercialization and industrialization of scientific and technological innovation results, and increase the rate in investment in scientific and technological innovation funds.

4.3 Key elements of material resources

The material capital of major railway engineering scientific and technological innovation sites, research and development platforms, and scientific research equipment is the basis for effective

scientific and technological innovation. Actively build a scientific and technological innovation platform for major railway projects, provide necessary venues and equipment for scientific and technological innovation of major railway projects, facilitate scientific and technological innovation personnel to carry out theoretical research, simulation calculation, product development, test verification and other scientific and technological innovation work, and provide scientific and technological innovation personnel a good office environment. The management of key elements of material resources is rationally allocate material resources to provide strong material support. According to the needs of scientific and technological innovation in major railway projects, timely deployment or purchase of applicable advanced scientific research instruments and R&D equipment shall be used to escort the development of scientific and technological innovation in major railway projects.

The organization and management of the entire process of scientific and technological innovation in major railway projects requires a reasonable allocation of key elements of human, material and financial resources in the railway industry, and strives to optimize the allocation of key elements. At the same time, the relevant preferential policies of the national and local governments for major railway projects must be focused, we should seize the opportunity to carry out scientific and technological innovation in major railway projects, establish a scientific organization and management system for the entire process of scientific and technological innovation in major railway projects, and make full use of internal and external resources in the railway industry.

5. Research on the Organization and Management Mode of the Whole Process of Scientific and Technological Innovation in Major Railway Projects

The scientific and technological innovation of major railway projects has the characteristics of long research period, large investment scale, high technical difficulty, many participants, diversified professionalism, and many uncertain factors. The quality, funding and intellectual property rights of major railway engineering scientific and technological innovations are important aspects of the organization and management of scientific and technological innovation. The three complements are indispensable. It is necessary to manage and control the entire process about the quality, funds, and intellectual property from the project application, implementation, acceptance and results management.

5.1 Quality Management of the Whole Process of Scientific and Technological Innovation in Major Railway Projects

Whole-process quality management is an important part of the whole-process organization and management of scientific and technological innovation in major railway projects. The whole-process quality management is mainly reflected in all aspects of the organization and management of scientific and technological innovation in major railway projects (such as the application, implementation, and the achievement application, etc.) management, the control of the key elements of scientific and technological innovation (such as the allocation of research personnel, the use of funds, instruments and equipment, etc.), that is the quality control process of the entire elements and the entire process of scientific and technological innovation in major railway projects.

(1) Quality management at the stage of application

During the scientific and technological innovation application stage in major railway projects, the research content related to scientific and technological innovation should be consulted. Next, the demonstration background of scientific and technological innovation should be understood and the development trend of the field also should be cleared. In addition, the research direction of scientific and technological innovation should be clarified, and sufficient demand analysis and feasibility demonstration should be conduct. Research on possible technical solutions in terms of development strategy, technical approach, key technical difficulty and development cycle requirements, etc., to make technical indicators technically feasible, economically affordable and timeable.

(2) Quality management in the stage of implementation

① Quality management of project establishment

From the application to the formal project approval, it is the key to the quality management of the whole process. The quality management work at this stage mainly includes: organizing the review of project declarations and formulating a practical project execution plan. Project applicants should judge whether they have carried out similar research work and research depth based on current research hotspots and combined with their own professional expertise. Project applicants should fill out the declaration form, and the management department will organize relevant professional experts to review, and improve the declaration form through reasonable summarization and adoption of expert opinions, so as to ensure the actual operability of the project. After the project is officially approved, the management department should guide the project team to formulate a scientific and phased implementation schedule according to the research and implementation cycle, including the project schedule and the schedule for each sub-project. The more detailed the plan, the more likely it is to foresee various issues that may affect the implementation of the project. For all kinds of problems that may affect the implementation of the project, we strive to find and solve the problems early to ensure the smooth implementation of the project.

②Quality management of project implementation

The goal of project implementation quality management is to ensure the completion of the tasks and indicators in the various stages of the task book or related contracts. The main quality control measures include that the management department must regularly understand the actual status of the project progress, which can be achieved by regularly submitting a written report on the project progress or irregular inspections, on-site investigations and inspections, consulting experiments and original instrument records, etc., so as to find and solve the problems in the project implementation process timely. At the same time, the evaluation of the phased results of major projects should be actively carried out at this stage. The main content of the evaluation includes: whether the project is carried out according to the original plan, whether the phased results obtained are consistent with the original goals, and the main problems faced in the current research, and key issues to be resolved in the follow-up research work, etc. The management department can realize the evaluation of phased results by organizing the evaluation of experts inside and outside the railway industry to provide suggestions for the implementation of the project and a basis for the continuous improvement of railway science and technology innovation.

③Quality management of project acceptance

Project acceptance quality management is to verify the completion of the final relevant assessment indicators of the project, and the project pre-acceptance mechanism is the main method to achieve quality management at this stage. The project team summarizes and provides the project acceptance materials. After the management department reviews the completeness of the acceptance materials, it organizes relevant experts to conduct a pre-review on the completion of the project. Based on the project mission statement or contract, the review and evaluation shall be carried out in combination with relevant technical documents, result test data, original experimental records and various certification documents. If on-site acceptance is required, experts can also be arranged to confirm the authenticity of the completion of various technical indicators after on-site inspections. At the same time, supply and improve relevant acceptance materials based on the suggestions of relevant experts. After the pre-acceptance is passed, the project team submits a formal acceptance application to the superior department to ensure that the project successfully passes the formal acceptance.

4.2 Fund management in the whole process of scientific and technological innovation in major railway projects

Fund management is an important part of the entire process of funding management for major railway engineering scientific and technological innovations. With the continuous deep of scientific and technological innovation in major railway projects, more and more attention has been paid to the use of funds. The efficiency, openness and transparency of the use of funds has become a concern point. Therefore, it is necessary to strengthen the application of the whole-process dynamic

management model, strictly manage the funds for scientific and technological innovation, and promote the smooth development of scientific and technological innovation of major railway projects.

(1) Fund management at the stage of reporting

Fund management at the application stage is an important part of the fund management in the entire process of scientific and technological innovation in major railway projects. At the reporting stage, it is necessary to decompose the fund management work and break down the project into easier-to-manage work packages to improve the accuracy of fund management. According to the declaration form, do a good job of budgeting for project funds, clarify the scope of fund management, the person in charge of the project and the fund management personnel, and formulate a detailed budget plan. Funding budget is the basic link of fund management, and fund management is to ensure that all funds spent in the whole process are included in the budget.

(2) Fund management at the stage of implementation

During the project implementation stage, the personnel involved in the project implementation need to carry out their work in accordance with the project funding budget, which is one of the most important links in project funding management. In the process of project implementation, it is necessary to check the status of project expenditures, examine whether there are problems with the expenditures, and if necessary, take appropriate and reasonable management measures to adjust in a timely manner to control possible funding risks and provide guarantees for the smooth completion of the project. The management department should strengthen the supervision of expenditure and the use of funds, supervise and manage the use of funds according to the actual progress of the project, track and warn the implementation of project funds, and timely monitor the use of project funds and the implementation of budget budgets. Report to ensure that the expenditures are kept in sync with the progress of the project.

(3) Fund management at the stage of acceptance and application of results

The stage of the project acceptance and results application is the last link in the entire process of fund management. The funding management in the project acceptance and results application stage is mainly reflected in the final financial accounting activities, that is, to ensure that the final financial accounting can accurately reflect the real investment situation of the project, and then carry forward the project income and expenditure data in the financial management work. Analyze comprehensively and carefully the errors in the entire process of fund management, and seize any difference between the actual expenditure and the budget, so as to realize the effective control of the cost of the fund management final account.

4.3 Intellectual Property Management in the Whole Process of Scientific and Technological Innovation in Major Railway Projects

The various stages of project declaration, implementation, acceptance, and application of results in programs of major railway engineering scientific and technological innovation are closely related to intellectual property rights such as patent rights, copyrights, and trademark rights. Strengthen the protection of intellectual property rights in the management, set up special agencies, improve relevant policies and regulations, and form a guarantee mechanism in the entire process of scientific and technological innovation.

(1) Intellectual property management at the stage of application

The patent system in intellectual property rights adopts the principle of first invention or first application to promote the early disclosure or use of inventions and creations. Before the project application stage, the patent literature search is performed to avoid duplication, to save the cost of scientific and technological innovation, and to prevent unconscious infringement. In the stage of application, an agreement must be reached on intellectual property issues, and the ownership of the intellectual property rights in the preliminary work shall be clarified, and a written agreement shall be made on the intellectual property rights of the new products, new processes, new equipment and other results formed during the project implementation process and after completion. According to the different nature and characteristics of intellectual property rights, combined with our country's existing laws and regulations for the protection of intellectual property rights, patent applications, software

registration, new plant varieties, application for integrated circuit layout design protection, as well as confidentiality (technical secrets), and disclosure can be adopted.

(2) Intellectual property management at the stage of implementation

In the project implementation stage, conduct tracking search of patent documents, keep abreast of the emergence of new intellectual property rights in related fields, make adjustments and supplements to the research direction and technical route of the project in a timely manner, and make adjustments and supplements to the proposed stage research results and final research results. Applications for patent in a timely manner. It is necessary not only to apply for patents in time for technologies with high implementation efficiency, wide promotion and use, and easy to be imitated, but also to deal with those areas where technological competition is fierce or some technologies currently have no implementation conditions, but in order to protect technological rights and avoid being controlled by others, it should also selectively apply for patents in a timely manner to obtain legal protection and occupy a position of technological advantage. In addition to the scientific research achievements expressed in the form of products or technologies, some of them are expressed in the form of textbooks, works, papers, computer software and other works. The protection of these copyrights is mainly embodied in universities or research institutes supervising the rights of signing, publishing, publishing, copying, transferring, benefiting, etc., and warning or legal proceedings against infringers.

(3) Intellectual property management at the stage of acceptance and application of results

The acceptance and application phases require necessary inspection, identification and supervision methods for the completeness, reliability and availability of archived technical documents. After the project is checked and accepted, the management of intellectual property files must be strengthened in particular. Make clear regulations on the collection, sorting, custody, utilization, identification, destruction, and transfer of intellectual property files. Make specific requirements for filing requirements, procedures, time, centralized and unified management, to prevent the loss of intellectual property rights. At the same time, the implementation of patents promotes the transformation of scientific research results. By implementing the management combination of results application and patent, there will be more space for commercialization and even industrialization of results. The intellectual property management of the whole process of technological innovation of major railway projects will be more conducive to improve the technological innovation capability and level of the railway industry. The number of patent applications, the level of intellectual property protection and awareness will also increase and gradually improve.

6. Conclusions

The technological innovation of major railway projects has the characteristics of long cycle, large scale, high technological content, and significant economic and social benefits. This article takes the scientific and technological innovation of major railway projects as the research object, analyzes the necessity and identifies the key elements from the aspects of human, finance and material. The organization and management process of the whole process is divided into three stages: declaration, implementation, and acceptance and achievement management. The main conclusions are as follows:

(1) The scientific and technological innovation of major railway projects is the motivation of the sustainable development. The organization and management of the whole process of scientific and technological innovation is of great significance for reducing the risks of scientific and technological innovation and ensuring the smooth completion of the project.

(2) In the process of technological innovation of major railway projects, the three stages of project declaration, implementation and acceptance and achievement management do not have strict or unified boundaries. There are overlapping and parallel activities in each stage, and problems occur in any link will affect the operational effects of technological innovation.

(3) Seize opportunities actively for technological innovation in major railway projects; make full use of relevant preferential policies of the state and local governments, and allocate key elements of human, material and financial resources rationally; give full play to the system advantages of

concentrating forces on major tasks, and make use of the internal and external aspects of the railway industry.

(4) The organization and management of the entire process of scientific and technological innovation in major railway projects focus on the entire process of management of the quality, funding and intellectual property rights of scientific and technological innovation, standardizing the management process, and ensuring the smooth development of projects.

This article aims to provide theoretical support for the organization and management of the entire process of scientific and technological innovation in major railway projects, and has certain reference value for standardizing the scientific and technological innovation organization and management mode of major railway projects, improving the efficiency of the allocation of scientific and technological innovation resources, and improving the level of refined management of scientific and technological innovation.

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