

We Will Innovate the Scientific Research Management System

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Abstract: This paper deeply discusses the urgency and implementation strategy of innovative scientific research management system. Under the background of the rapid development of science and technology, the traditional scientific research management system has been stretched thin, and it is difficult to meet the diversified and efficient needs of scientific research activities. Therefore, we urgently need to review and reform the existing scientific research management system. Firstly, this paper objectively analyzes the shortcomings of the current scientific research management system, as well as the challenges and difficulties it faces, and then leads to the urgency and necessity of innovating the scientific research management system. On this basis, the paper deeply analyzes the theoretical foundation of the innovative scientific research management system, and combines the advanced practice in this field at home and abroad to provide us with valuable reference. More importantly, the paper puts forward a series of practical strategies and suggestions, such as building a diversified scientific research investment mechanism, optimizing the scientific research evaluation system and incentive mechanism, and strengthening the construction of scientific research ethics and study style, so as to provide powerful theoretical support and practical guidelines for the innovation of scientific research management system.

Keywords: Scientific research management system; Innovate; Diversified investment; Evaluation system; Incentive mechanism; Scientific research ethics.

1. Introduction

In the backdrop of today's fast-paced technological advancements, the significance of innovating the scientific research management system cannot be overstated. This system serves as the backbone for driving scientific and technological progress, which in turn fuels social development. The conventional scientific research management system, while effective in its time, now faces challenges in accommodating the intricate and ever-changing nature of modern scientific inquiries. The rigid framework and processes of the traditional system often hinder the fluidity and creativity necessary for cutting-edge research, thus impeding scientific breakthroughs^[1]. This stagnation not only affects the pace of scientific discovery but also undermines the efficient translation of research into tangible technological advancements and societal benefits. Innovating the scientific research management system is not just a pragmatic solution to enhance research productivity and facilitate the application of scientific advancements; it aligns with the broader national agenda of fostering technological innovation. Such innovation is crucial for streamlining research processes, encouraging creativity, and ensuring that scientific endeavors yield maximum societal impact. This paper delves into the compelling need for renovating the scientific research management system, the obstacles that stand in the way, and strategies to overcome them. Our aim is to contribute constructive ideas and insights that pave the way for a more dynamic, responsive, and effective scientific research management system. By doing so, we aspire to catalyze a transformation that better aligns research efforts with the evolving needs of society, ultimately accelerating scientific and technological progress for the benefit of all

2. Basic Concepts of Scientific Research Management System

The scientific research management system is an intricate and multifaceted construct designed to orchestrate and streamline scientific and technological research and development endeavors within a specific societal context^[2]. This system encompasses a wide array of components, ranging from initial policy formulations to the intricate details of resource allocation, project oversight, personnel development, achievement assessments, and the seamless integration of scientific advancements with industrial and societal needs.

The overarching objective of this comprehensive system is to elevate the efficiency and effectiveness of scientific inquiries, foster technological innovations, and ultimately, drive societal progress. Central to this endeavor is an agile organizational structure that can adapt swiftly to uncertainties and the rapid pace of technological evolution. Such a structure ensures that research efforts remain aligned with emerging trends and demands^[3].

Furthermore, this system demands a robust decision-making framework that guarantees the prudent allocation and optimal utilization of precious scientific resources. This not only enhances the overall quality of research outputs but also ensures that financial and human resources are not squandered.

Within the scientific research management system, the lifecycle of a scientific project is meticulously managed, from its inception through to completion. During the project's establishment phase, rigorous scientific evaluations are conducted to ascertain clear research objectives, delineate the scope of work, and finalize the methodologies to be employed^[4]. Once the project enters its implementation phase,

a robust project management mechanism is put in place to oversee its progress and ensure adherence to predetermined plans and timelines.

Throughout the project's duration, continuous monitoring and supervision are conducted to maintain the highest standards of research quality and track progress. Upon completion, a comprehensive evaluation of the research outcomes is undertaken to ascertain their academic merit and potential for practical applications.

Complementing this structured approach to project management is a comprehensive evaluation and incentive system for scientific personnel. This system encompasses detailed guidelines for appraising researchers' professional titles, rewarding outstanding achievements, and allocating research funds in a manner that fosters a competitive yet collaborative environment^[5]. Such measures are instrumental in motivating researchers and sustaining their enthusiasm for scientific exploration.

In essence, the scientific research management system is a highly integrated and interconnected web of policies, procedures, and incentives, all working in harmony to propel scientific and technological advancements that benefit society as a whole. It is a testament to the collaborative efforts of diverse stakeholders committed to fostering innovation and driving progress in the realm of scientific research.

3. Innovative Measures of Domestic Scientific Research Management System

In recent years, the innovation measures of the domestic scientific research management system have become increasingly significant, and these changes are aimed at stimulating the vitality of scientific research, improving the efficiency of scientific research, and promoting the transformation and application of scientific and technological achievements. Among them, the most striking innovative practices include the following aspects. In the management of scientific research projects, China began to implement the reform of "delegating management services", simplify the application and approval process of scientific research projects, reduce unnecessary administrative intervention, and give scientific research teams greater autonomy^[6]. Through

the implementation of classified management of scientific research projects, the use mechanism of project funds is optimized, the efficiency of fund use is improved, and the innovation enthusiasm of researchers is stimulated. In terms of the setting of scientific research institutions, China is promoting the integration and optimization of scientific research institutions, breaking down the segmentation, and building an interdisciplinary and cross-field scientific research innovation platform.

The move strengthens the "integrated" management of science and technology businesses, allowing 245 provincial-level science and technology businesses to be handled through a single online platform. We integrated the originally dispersed platform to provide a unified entrance for the province's science and technology departments, thus solving the problems faced by 566,600 scientific research workers, such as repeated login, repeated information filling and "second entry" of scientific research projects. This initiative promotes the collaborative management of provincial and municipal science and technology business, realizes the integrated application of data, and provides a "free and enjoy" service for municipal and municipal business management. In 2021, we will transfer the registration result data of 8,226 technology contracts to the Guangzhou Science and Technology Bureau, so that relevant technology enterprises can enjoy preferential policies without applying. Service delivery time has been significantly reduced from 1 year to 7 days, significantly improving service efficiency. At the same time, we have incorporated the science and technology business platform into the province's "integrated" service platform management, and realized the sharing of data related to various science and technology businesses, such as results, financial and tax data. In addition, we also provide public services such as electronic signatures, electronic signatures, electronic licenses, etc., bringing convenience to scientific and technological enterprises and researchers. In 2021, we achieved two-way sharing of science and technology government data with the state and cities, sharing about 640,000 items of data. This not only improves the management quality and efficiency of science and technology business in the province, but also promotes the high-quality development of administrative approval and management of other government departments in the province.

Table 1. Science and technology government data interdepartmental data sheet

index	Numerical value
Provincial science and technology business "one netcom office" number	245
Number of researchers	566,600
Technical contract registration results number of data decentralization	8226
Service delivery time (original/current)	1 year /7 days
Two-way sharing of scientific and technological government data volume	About 640,000 items

4. Strategies and Suggestions for Innovative Scientific Research Management System

With the rapid development of science and technology, the innovation of scientific research management system becomes more and more important. Building a diversified scientific research investment mechanism can not only promote the vigorous development of scientific research activities, but also effectively improve the output and quality of scientific research results. In the following, we will discuss how to construct this mechanism from many aspects, and put forward corresponding strategies and suggestions.

4.1. Diversification of funding sources

The importance of scientific research funds is self-evident, it is the fuel of scientific research activities to continue. Under the traditional model, we rely mainly on financial allocations from the government, which is undoubtedly a stable but limited resource. However, with the explosion of research demand and the diversification of activities, this single source of funding appears to be inadequate. For the sustainable development of scientific research, we must find more funding channels. This is where the appeal of social capital comes in^[7]. Social capital is not only large in quantity, but also flexible and innovative. Imagine if we could set up a research and innovation fund to attract this capital, it would be a win-win situation: social capital gets a return on investment, and research gets valuable financial support. Further, in order to encourage such investment, the government can provide some tax incentives or policy support, which can ensure the return

of social capital and ensure the steady progress of scientific research.

Strengthening cooperation with enterprises is also the key to solving the funding problem. The market economy is dominated by businesses, which have the capital, the demand and the urge to innovate. Cooperation between scientific research institutions and enterprises can be said to be a match made in heaven. Through the model of integration of production, university and research, scientific research institutions can obtain stable financial support, while enterprises can get cutting-edge technical support and excellent personnel training^[8]. This deep cooperation not only solves the problem of scientific research funding, but also paves the way for the transformation and application of scientific research results. In addition, international cooperation and exchange is also a source of funding that cannot be ignored. In today's globalized world, scientific research is no longer the sole effort of one country or one institution. Cooperation with international scientific research institutions or enterprises can bring us more financial support and a broader technical vision. For example, by jointly applying for international research funds or project support, we can not only obtain more funds, but also carry out in-depth technical exchanges and cooperation with top international research institutions, which will undoubtedly greatly enhance our scientific research level and international influence.

This table summarizes key fiscal policies and measures taken by the Ministry of Finance to support technological innovation, including goals for 2024, policy orientations, strategies to motivate researchers, and efficient funding allocation.

Table 2. Fiscal Policies Supporting Technological Innovation

Key Points	Description
Fiscal Support	The finance department utilizes various policy tools such as tax incentives and government procurement to fully support technological innovation.
2024 Goals	The Ministry of Finance aims to implement stronger measures to promote the construction of a modern industrial system driven by technological innovation, focusing on developing new productive forces.
Policy Focus	1. Emphasizing the leading role of enterprises in innovation. 2. Leveraging market demand. 3. Enhancing the resilience and security of industrial and supply chains. 4. Stimulating the creativity of researchers.
Motivating Researchers	1. Advancing salary system reforms in universities and research institutes. 2. Accelerating reforms for ownership or long-term usage rights of professional scientific and technological achievements to incentivize researchers.
Funding Allocation	Reforming the allocation and use of scientific research funding, focusing on: 1. Basic and applied research investment. 2. Core technology research and development. 3. Strengthening national strategic scientific and technological forces. 4. Improving resource integration and performance management efficiency.

To sum up, the diversification of funding sources holds the key to the sustained development and growth of scientific research. In an increasingly competitive global environment,

attracting and securing funds from various avenues becomes crucial for the advancement of science and technology. By actively seeking social capital, not only are we broadening the

financial base for scientific inquiries, but also encouraging a wider range of stakeholders to participate and invest in research. Strengthening cooperation with enterprises is another vital aspect. Collaborations between academia and industry can bring mutual benefits, allowing for the exchange of knowledge, resources, and expertise. Enterprises often possess the latest technologies and market insights, which can greatly enhance the practical relevance and applicability of scientific research. Moreover, conducting international cooperation and exchanges is essential in today's interconnected world^[9]. Such collaborations provide access to a wider pool of resources, expertise, and perspectives, vital for pushing the boundaries of scientific knowledge. Through international partnerships, we can learn from global best practices, share resources, and jointly tackle complex scientific challenges. By adopting these strategies, we can inject more vitality and funding into scientific research, driving innovation and discovery. The infusion of diverse funding sources not only ensures the financial sustainability of research projects but also encourages creativity and experimentation, leading to the vigorous development of scientific exploration and discovery.

4.2. Diversification of input methods

In the traditional scientific research management system, funding is almost the only way to support, but this mode gradually shows its limitations. In order to promote the development of scientific research activities in a more comprehensive way, we must find and practice diversified

investment methods. The introduction of project funding and reward mechanism is a beneficial supplement to the traditional investment method. Imagine when an innovative and practical scientific research project is implemented because of the special funding fund, which is undoubtedly a great encouragement for researchers. The establishment of the reward mechanism for scientific research achievements has provided real incentives for those teams or individuals who have achieved outstanding results. This is not only a financial reward, but also a recognition and honor from peers, which can greatly improve the enthusiasm and enthusiasm of scientific researchers^[10]. But the diversity of inputs goes far beyond that. We must realize that the core of scientific research activities is talent, without talent, no amount of money is just empty talk. Therefore, strengthening the support and training of talents, providing high-quality working environment and advanced experimental equipment, and creating better career development opportunities for scientific researchers are important supplements to scientific research investment. Furthermore, we should also provide them with comprehensive training programs to ensure that their knowledge and skills are always up to date. To sum up, the diversification of investment methods is not only the diversification of funds, but also the all-round support and training of scientific researchers. Only in this way can we ensure the sustainable and healthy development of scientific research activities.

The following is a table summarizing the research file and data management recommendations mentioned in the text:

Table 3. Research documents and data management strategy recommendations

No.	Management Recommendation	Specific Measures
1	Preserve historical versions of files	Save a new version every time the file is modified for easy review and comparison of differences between versions.
2	Develop good file naming conventions	Use clear and specific file naming methods that include file content, modifier, date, and other information to avoid confusion.
3	Reasonably structure and name folders	Adopt a hierarchical folder management system, such as dividing into pending, categorized storage, and archiving areas, and use numerical coding for naming.
4	Ensure file backup and synchronization	Regularly back up important files to different storage devices and utilize cloud synchronization tools to keep files synced across different devices.
5	Retain electronic copies of signed documents	Use scanning tools to convert signed documents into electronic format and properly store them for easy retrieval and use in the future.

Adopting reasonable file and data management strategies not only improves work efficiency but also ensures the security and traceability of scientific research data. This is an essential skill that every research worker should value.

4.3. Diversification of input subjects

Under the traditional scientific research management system, we often see that government research institutions and universities, as the main subjects of scientific research investment, undertake most of the scientific research tasks. However, in today's rapidly changing science and technology,

this model is powerless and cannot meet the comprehensive needs of scientific research and innovation. To this end, we must seek and encourage more social subjects to participate in scientific research investment.

In this, the role of business cannot be ignored. As the main body of market economy, enterprises have a keen insight into market demand and technology application. The government can encourage enterprises to increase investment in scientific research by introducing relevant policies, such as providing tax incentives and financial support for R&D investment. In this way, enterprises can not only enhance their own

competitiveness, but also contribute to the scientific research and innovation of the whole society. In addition, we cannot ignore the potential of social organizations and individuals to invest in research^[11]. They are an important part of the social forces, with a wide range of resources and a unique perspective. The government can stimulate their enthusiasm for participation in various ways, such as setting up social research funds and encouraging people from all walks of life to provide financial support for research projects; Carry out a variety of science popularization activities to improve the scientific literacy of the public and make them pay more attention to and support scientific research; Scientific and technological innovation competitions will be held to attract more innovators and enthusiasts to participate in scientific research and innovation practice. Through these measures, we can effectively broaden the source of scientific research funds, but also improve the public's awareness of and support for scientific and technological innovation, and form a good atmosphere for the whole society to participate in and support scientific research and innovation.

4.4. Flexibility of input cycle

Because of its long-term nature and uncertainty, scientific research needs a flexible investment mechanism to adapt to it. This mechanism should not only meet the immediate needs of scientific research, but also support long-term research efforts. To this end, we have designed a variety of investment strategies. For some research projects that can be completed quickly and show results in a short period of time, we provide short-term project funding. This funding model aims to respond quickly to the needs of scientific research, so that scientific research results can be translated into social benefits in the shortest time. However, research is not all quick work. Many studies require long-term observation, experiment and analysis, which requires stable support in the medium and long term. This includes financial, equipment and human resources to ensure consistency and depth of research. For those research projects with great scientific value or application prospects, we are even more devoted to providing continuous and high-intensity investment. From the establishment of special research funds, to the establishment of professional research teams, to the installation of state-of-the-art experimental equipment, we are committed to creating all the conditions to promote these major projects to achieve breakthrough results.

5. Policy Suggestions and Measures

In order to promote the innovation of scientific research management system, it is very important to construct a diversified scientific research investment mechanism. This is not only related to the sustainability and quality of scientific research activities, but also directly affects the national scientific and technological innovation capacity and the driving force of economic and social development. Therefore, we propose the following specific policy recommendations and measures.

First of all, the improvement of relevant policies and regulations is the basis of the reform of scientific research investment mechanism. At present, research investment involves many subjects, including governments, enterprises, social organizations and individuals, and the responsibilities and obligations of all parties need to be clearly defined. Therefore, policies and regulations related to scientific research investment should be formulated and improved to

ensure that the rights and interests of all parties in scientific research activities are protected. At the same time, the use of research funds must be subject to strict supervision and evaluation. In order to prevent the misappropriation, waste and inefficient use of funds, a sound management system for scientific research project funds should be established, and the use of scientific research funds should be monitored and audited in real time. In addition, a quality evaluation system for scientific research results should be established to ensure that the invested funds can produce high-quality scientific research results.

Secondly, optimizing the investment structure is the key to improve the efficiency of scientific research investment. Different scientific research projects have different needs and characteristics, so it is impossible to carry out funding investment across the board. Basic research is the source of scientific and technological innovation, and investment in basic research should be continuously and steadily increased. At the same time, applied research and industrialization projects should also receive sufficient attention and support to promote the transformation and application of scientific research results. In addition, personnel training and team building are important guarantees for the sustainable development of scientific research activities. Therefore, the investment in scientific research should pay attention to the investment in personnel training funds to provide stable working environment and conditions for scientific research teams.

Improving investment efficiency is an important goal of the reform of scientific research investment mechanism. In order to achieve this goal, the evaluation mechanism of scientific research projects and the survival of the fittest mechanism should be established. Regular evaluation of the progress and results of scientific research projects, timely identification of problems and adjustments. For projects that progress slowly or fail to reach the expected goals, the investment strategy should be adjusted decisively or the project should be terminated to avoid the waste of resources. At the same time, the transformation and application of scientific research results should be strengthened. Through cooperation with enterprises, the establishment of technology transfer institutions, etc., to promote scientific research results out of the laboratory, into products or services with market competitiveness.

In the context of globalization, strengthening international cooperation and exchanges is of great significance for enhancing the level and international influence of scientific research. Through cooperation and exchanges with international scientific research institutions or enterprises, we can jointly apply for international scientific research projects or fund support to broaden the source of funds. At the same time, this kind of cooperation and exchange can also help us understand the cutting-edge trends and technological trends of international scientific research, and improve our scientific research level and innovation ability. Therefore, it is necessary to actively participate in international scientific research cooperation programs, organize researchers to go abroad for exchange and study, hold international academic conferences and other activities, and strengthen the contact and cooperation with the international scientific research community.

In addition to the various measures mentioned, it is crucial to recognize and foster the innovative spirit and enthusiasm inherent in scientific researchers. The researchers themselves

are the lifeblood of scientific exploration, and their drive to innovate and passion for discovery are the invisible forces that propel scientific advancements.

To harness and nurture this vital energy, institutions must establish a fair and motivating incentive mechanism. This goes beyond mere financial rewards; it encompasses recognition, opportunities for advancement, and a sense of fulfillment in knowing that their work is valued and contributes to the greater good. A well-designed evaluation system that takes into account the unique contributions of each researcher, rather than solely relying on quantitative metrics, can be a powerful tool in maintaining and enhancing their motivation.

Furthermore, the professional development of researchers should not be neglected. Ongoing training and education are paramount in ensuring that they remain at the forefront of their fields. This involves not just keeping abreast of the latest scientific knowledge but also honing their skills in areas like project management, team leadership, and effective communication. Regular professional skills training, coupled with opportunities for academic exchange, can significantly enrich a researcher's expertise and broaden their horizons.

In essence, fostering the innovative spirit and enthusiasm of scientific researchers demands a holistic approach that encompasses incentives, recognition, professional development, and a conducive work environment. By investing in the growth and satisfaction of their researchers, institutions can unlock a powerful engine of scientific progress. To sum up, building a diversified scientific research investment mechanism is a systematic project, which requires the joint efforts of the government, enterprises, society and individuals. The government should play a leading role in formulating and improving relevant policies and regulations. Enterprises should actively participate in scientific research investment and achievement transformation; Social organizations and individuals should also support and participate in scientific research through various means. Only through the joint efforts and cooperation of the whole society can we effectively promote the innovation and development of the scientific research management system, and provide strong support for scientific and technological innovation and economic and social development.

6. Summary

This paper seeks to delve into the significance of an innovative scientific research management system and outline its effective implementation strategies. By closely examining the prevailing conditions and obstacles within the scientific research management framework, we underscore the urgent need for renovation in this sphere. Drawing from established theories, we undertake a comprehensive exploration of how innovation doctrines can be integrated into scientific research administration. Our study also

encompasses a comparative analysis of pioneering practices in scientific research management, both domestically and internationally.

This comprehensive assessment forms the foundation for our proposed strategies, which include the establishment of a diversified research funding mechanism. Such a mechanism aims to broaden the scope and reach of scientific inquiries by attracting investments from multiple sources. Furthermore, we advocate for the refinement of the research evaluation system and the associated incentive structure.

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