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Construction Strategy of Evaluation Index System of Applied Scientific and Technological Achievements

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Abstract: With the continuous progress of global science and technology and the rapid development of China's scientific research level, as an important driving force for the progress of scientific and technological innovation, there are some problems in the evaluation index system of applied scientific and technological achievements, such as the untimely updating of the evaluation expert database, the imperfect supervision system, the unhealthy orientation of "achievement-only theory", the strong subjectivity of evaluation and the weak confidentiality of materials. To solve these problems, this paper puts forward some strategies, such as improving the selection mechanism of experts, establishing and perfecting the supervision system, establishing the correct values of scientific research achievements, establishing a diversified evaluation system of achievements and establishing an efficient management mechanism of evaluation materials, which is of positive significance to the construction of a more scientific, objective and fair evaluation index system of applied scientific and technological achievements. It also provides strong support and guidance for scientific and technological innovation and social development.

Keywords: Applied Scientific and Technological Achievements; Evaluation Index System; Problems; Strategies

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Introduction

With the continuous progress of science and technology and the rapid development of society, the evaluation of applied scientific and technological achievements plays an important role[1]in promoting scientific and technological innovation, promoting social progress and improving economic competitiveness. The evaluation of applied scientific and technological achievements is a process of comprehensive evaluation and recognition of the achievements made by scientific researchers in practical application, which is an important means to encourage scientific research innovation, improve the quality of scientific and technological achievements and promote the transformation of scientific and technical achievements. It is imperative to[2,3]construct a scientific and reasonable evaluation index system of applied scientific and technological achievements.

After China's entry into the new era of socialist modernization, the importance of establishing a scientific and reliable evaluation index system of applied scientific and technological achievements is increasing, because the current evaluation index system of applied scientific and technological achievements is facing many challenges and problems, which limit its effectiveness and fairness[4]. Therefore, the purpose of this study is to explore the construction strategy of the evaluation index system of applied scientific and technological achievements in order to solve the problems existing in the current evaluation system and improve the scientificity and objectivity of the evaluation system, which has important practical significance for promoting the development and practice of the evaluation index system of applied scientific and technological achievements.

1. Significance of Establishing the Evaluation Index System of Applied Scientific and Technological Achievements

1.1 Stimulate the Innovation Enthusiasm of Scientific Research Personnel

It is of great significance to establish a scientific and rational evaluation index system of applied scientific and technological achievements for promoting scientific and

technological innovation. Scientific and technological innovation is the key driving force to promote social progress and economic development. In the process of scientific and technological innovation, scientific researchers have made continuous efforts to carry out technological research and development, engineering design and other work, resulting in a wealth of applied scientific and technological achievements. If there is no scientific and effective evaluation index system to evaluate these achievements, it will be difficult. The enthusiasm and innovation passion of scientific researchers may be suppressed[5]. Establishing the evaluation index system of applied scientific and technological achievements can encourage researchers to invest more energy and resources, and improve the quality and efficiency of scientific and technological innovation.

1.2 Improving the Quality and Efficiency of Scientific and Technological Achievements

It is very important to establish a scientific and reasonable evaluation index system of applied scientific and technological achievements for improving the quality and efficiency of scientific and technological achievements. In the current environment of rapid change and fierce competition in the development of science and technology, scientific researchers are facing the challenge[6]of promoting the quality of scientific and technological achievements and realizing the effective application of scientific and technological achievements. The evaluation index system can help researchers fully understand their own scientific and technological achievements, and compare them with industry standards and cutting-edge technologies, so as to find the shortcomings of scientific and technological achievements and the direction of improvement.Through the scientific evaluation index system, researchers can improve the evaluation results and improve the quality and practicability of scientific and technical achievements. Furthermore, the establishment of the evaluation index system of applied scientific and technological achievements can also help scientific research institutions and enterprises to better allocate resources and make decisions, because the evaluation index system can provide scientific basis for scientific research institutions and enterprises in the

direction of scientific research, which helps to improve the utilization efficiency of scientific research resources and further promote the improvement of scientific innovation ability.

1.3 Promoting the Transformation and Application of Scientific and Technological Achievements

Establishing a scientific and reasonable evaluation index system of applied scientific and technological achievements plays an important role in promoting the transformation and application of scientific and technological achievements. The transformation and application of scientific and technological achievements is an important part of scientific and technological innovation, which is directly related to the social value and economic benefits of scientific research achievements, and the evaluation index system can help scientific researchers and science and technology management departments to better understand the market potential and application prospects of the scientific and technological achievements, so as to carry out the transformation and promotion[7]of the scientific and technical achievements. In addition, the establishment of the evaluation index system can also promote the close cooperation between scientific researchers, enterprises and the market, which can provide motivation and opportunities for scientific researchers to cooperate with enterprises, help scientific researchers better understand market demand and industry trends, and then adjust the direction and content of research, so that scientific and technological achievements can better meet the needs of practical application.

2. Problems Existing in the Current Evaluation Index System of Applied Scientific and Technological Achievements

2.1 The Review Expert Database is Not Updated in Time

As an important support for the evaluation of applied scientific and technological achievements, the evaluation expert database plays a key role in ensuring the professionalism and authority of the evaluation process. With the rapid development of science and technology, new technologies and fields are constantly emerging, and the

evaluation expert database needs to be updated in time to keep the expertise of experts and knowledge books at the forefront of related fields, but in the practice of evaluation of applied scientific and technological achievements, the update of expert database is often lagging behind, which seriously affects the scientificity and accuracy of the evaluation results. The reliability[8]of the evaluation index system is reduced. On the one hand, experts who do not match the target outcome area may not be able to understand the significance of the outcome and provide accurate and authoritative review opinions; on the other hand, if the knowledge and experience of experts are outdated, they may not be able to fully understand and evaluate the innovation and practicality of the outcome. In addition, if there is a lack of suitable experts in the pool of evaluation experts, it may lead to delays and delays in the evaluation work, which will make some suitable experts unable to be included in the evaluation process and miss the opportunity to give full play to their expertise and experience.

2.2 Unsound Supervision System of Evaluation Process

The evaluation process of applied scientific and technological achievements needs a clear supervisory body and corresponding supervisory responsibilities to ensure the scientificity and fairness of the evaluation. However, in practice, there are still many problems in the supervision mechanism of the evaluation process, specifically in three aspects. First, there is a lack of clear evaluation and supervision institutions and clear supervision responsibilities. The supervision of the evaluation process requires a clear institution or organization responsible for supervising the evaluation activities to ensure the scientificity, fairness and transparency of the evaluation process. However, the lack of sufficient supervision institutions and corresponding supervision responsibilities leads to the lack of effective organization and coordination of the supervision of the assessment process. Second, there is a lack of effective supervision measures and means. The supervision and evaluation process needs to establish a set of effective supervision measures and means to ensure the compliance and quality of the evaluation process. However, the current evaluation process supervision system is deficient in supervision measures and means, and lacks comprehensive monitoring and supervision means for

the evaluation process, which makes it difficult to find and correct problems and deviations in the evaluation process in time. Thirdly, the supervision system of evaluation process lacks effective feedback mechanism. It is necessary to establish an effective feedback mechanism in order to obtain the problems and opinions in the evaluation process in time, and further improve and improve the evaluation index system and the evaluation process. However, the current supervision system has deficiencies in the feedback mechanism, which can not effectively collect and utilize the feedback information from participants and stakeholders.

2.3 Unhealthy "Results-only" Orientation

In the current evaluation of applied scientific and technological achievements, there is an unhealthy tendency, that is, "achievement-only theory". This refers to overemphasizing the quantity and superficial effect of scientific research achievements, ignoring the innovation and depth of the scientific research process, which leads to the over-utilitarian evaluation system[9].

Firstly, the orientation of "achievement-only theory" leads researchers to pay more attention to quantity and external performance in pursuit of scientific and technological achievements, while ignoring the depth and innovation of scientific and technological achievements. This will lead researchers to pursue short-term research results and application effects too much, while ignoring long-term basic research and original innovation. Scientific and technological innovation requires solid basic research and in-depth thinking, while the "results-only" orientation easily leads to the superficiality and utilitarianism of the scientific research process, weakening the innovation and long-term value of scientific and technological achievements. Secondly, the "result-oriented" orientation may lead researchers to be influenced by external unhealthy incentive mechanisms when choosing research directions and carrying out research work, thus deviating from the essential objectives of scientific research. Scientific research should aim at solving important scientific problems and promoting the development of disciplines, rather than simply pursuing the quantity and external effects of achievements.However, under the orientation of "achievement-only theory",

researchers may pay more attention to the hot spots and frontiers of research directions, while neglecting the in-depth thinking and solution of the essential problems of disciplines. Finally, the orientation of "achievement-only theory" easily leads to the simplification and standardization of the performance indicators of scientific research achievements, which weakens the diversity of scientific and technological achievements. The evaluation of scientific and technological achievements should comprehensively consider the innovation, practicality, social influence and other dimensions of scientific research, and should not be limited to quantity and superficial effects.However, due to the existence of the "achievement-only" orientation, the evaluation system relies too much on quantitative indicators, ignoring the diversity and individual differences of scientific and technological achievements.

2.4 The Result Evaluation is Highly Subjective.

There is an important problem in the current evaluation index system of applied scientific and technological achievements, that is, the subjectivity in the process of achievement evaluation is strong. This means that the evaluation results are often influenced by the subjective opinions and preferences of the evaluation experts, and lack of objective and unified standards and criteria[10].

The subjective preference of evaluation experts may affect the accuracy and fairness of the evaluation results. Different evaluation experts may give different evaluations on the same scientific and technological achievements because of their different professional backgrounds, academic viewpoints and personal preferences, which leads to a certain degree of subjectivity and individual differences in the evaluation results, which may result in inconsistent evaluation of scientific and technological achievements and reduce the objectivity and scientificity of the evaluation index system.

The lack of clear standards and criteria in the evaluation process makes the evaluation experts lack a unified reference framework when evaluating scientific and technological achievements. This makes the evaluation results vulnerable to personal subjective opinions and lack of objective and comparable basis, which not only affects

the accuracy of the evaluation results, but also may lead to the deviation of the evaluation of scientific and technological achievements, which is not conducive to the development of scientific and technological innovation and application.

Subjectivity in the evaluation process is also influenced by the personal biases and conflicts of interest of the review experts. Evaluation experts may have interests related to scientific and technological achievements, such as cooperation with specific scientific research institutions or enterprises, or tendentiousness with some viewpoints and theories in the research field. These personal prejudices and conflicts of interest may lead to unfair and biased evaluation results, affecting the objectivity and impartiality of the evaluation index system.

2.5 The Confidentiality of Evaluation Materials is Not Strong

There is still a significant problem in the current evaluation index system of applied scientific and technological achievements, that is, the confidentiality of evaluation materials is not strong. The evaluation materials contain sensitive contents such as innovative achievements of scientific researchers, business confidential information and research data, and the confidentiality of these evaluation materials has[11]been challenged in the evaluation process.

On the one hand, the lack of confidentiality of evaluation materials will lead to the disclosure of intellectual property rights related to the results. In the process of evaluation, researchers need to provide relevant research results and data, which may contain their innovative achievements and intellectual property rights. The lack of confidentiality of evaluation materials may lead to the disclosure of these intellectual property rights, which may infringe or improperly use the innovative achievements of researchers and damage their legitimate rights and interests.

On the other hand, the lack of confidentiality of evaluation materials will lead to unfair commercial competition. The evaluation materials may contain trade secret information, such as details of cooperation with specific enterprises or organizations, business plans and market strategies, etc. The lack of confidentiality of the evaluation materials may

expose these trade secret information to competitors or other unrelated parties, leading to unfair and improper business competition.

In view of the above problems, it is urgent to explore and take a series of measures to improve the scientificity, objectivity and reliability of the evaluation index system, so as to effectively enhance the fairness of the evaluation of scientific and technological achievements.

3. The Strategy of Establishing the Evaluation Index System of Applied Scientific and Technological Achievements

3.1 Timely Update the Evaluation Expert Database and Establish a Sound Expert Selection Mechanism

Timely updating the evaluation expert database and establishing a sound expert selection mechanism are important supports to ensure the scientificity and objectivity of the evaluation index system of applied scientific and technological achievements.

It is necessary to establish a dynamic management mechanism to update the evaluation expert database in time. The pool of evaluation experts should be reviewed and updated regularly to ensure that the knowledge and experience of experts keep pace with the latest scientific and technological developments, which can be achieved by regularly soliciting applications from experts, reviewing and evaluating the qualifications of experts, adding new experts to the pool as needed, and establishing an expert information management system. Record the background, professional field, research direction and other detailed information of experts, so as to facilitate the matching and selection in the evaluation process.

It is necessary to establish a sound expert selection mechanism. The selection mechanism should clarify the procedures and criteria for the selection of experts and follow the principles of openness, fairness and transparency. On the one hand, we can formulate the conditions and requirements of evaluation experts according to the needs of evaluation, including professional background, academic attainments, research experience and other aspects; on the other hand, we can widely collect qualified expert

candidates through expert self-recommendation, academic institution recommendation, professional association recommendation and other channels. In the selection process, multi-round evaluation and multi-angle evaluation should be adopted to comprehensively consider the academic level, research experience, academic reputation and other factors of experts, so as to ensure that the selection of evaluation experts is fair and objective.

Expert selection committees or expert committees should be established. The committee is composed of authoritative experts in relevant fields and is responsible for reviewing, evaluating and selecting evaluation experts. Members of the committee should have rich academic experience and professional knowledge, and be able to conduct comprehensive and objective evaluation and selection of expert candidates. The establishment of the committee can ensure the independence and impartiality of expert selection, and provide scientific and authoritative professional advice.

Attention should be paid to the transparency and openness of the selection process. The selection process of evaluation experts should be open, and relevant information and decisions should be made public to participants and stakeholders in a timely manner, so as to ensure the openness and transparency of the selection process and enhance the credibility and fairness of the evaluation index system.

3.2 Establish and Improve the Supervision System to Ensure the Entire Process of Achievement Evaluation is Supervised

Establishing a sound supervision system is an important link to ensure the fairness and transparency of the evaluation index system of applied scientific and technological achievements, and is conducive to enhancing the scientificity and credibility of the evaluation index system.

First of all, we should establish a clear supervisory body and clear supervisory responsibilities. A special supervisory body should be set up and be responsible for supervising the whole process of the evaluation of applied scientific and technological achievements. The organization should have the corresponding authority and

independence to ensure the fairness and reliability of the evaluation process, and in this process, the supervision responsibility should be clearly defined to ensure that the work responsibilities and supervision functions of the supervision organization can be implemented.

Secondly, we should formulate effective supervision measures and means. Supervision measures can include regular assessment, review and inspection to ensure the compliance and quality of the evaluation process. The supervision organization can supervise and verify the key links in the evaluation process by means of on-site inspection, random inspection and expert review, which can help to find problems and shortcomings in the evaluation process and correct and improve them in time.

Then, we should strengthen the training and supervision of supervisory institutions and supervisors. Supervisory institutions and supervisors should have professional knowledge and skills and be able to perform their supervisory duties independently and objectively. The training can cover the evaluation index system, evaluation process and relevant laws and regulations, so as to improve the professional level and supervision ability of supervisors, and establish the daily management and supervision mechanism of supervisors by supervision institutions to ensure that their work meets the supervision requirements and professional ethics.

Finally, an effective complaint and appeal mechanism should be established. During the evaluation process, participants and stakeholders should have the right to lodge complaints and appeals against unfair acts and irregularities in the evaluation process. The evaluator should establish a corresponding complaint and appeal acceptance mechanism to deal with and solve relevant problems in a timely manner, and provide feedback and response to the complainant, which will enhance the fairness and transparency of the evaluation process. And to ensure the credibility and acceptability of evaluation results.

3.3 Establish Correct Values of Scientific Research Achievements and Abandon the Idea of "Achievement-Only Theory"

Establishing a sound supervision system is the core to ensure the fairness and transparency of the evaluation index system of applied scientific and technological achievements, which is conducive to promoting the evaluation of scientific and technological achievements to reflect their contributions and values more comprehensively and accurately.

First, we should emphasize the innovation and originality of scientific research. The evaluation of scientific and technological achievements should pay attention to the innovation and originality in the process of scientific research, not only to the quantity and superficial effect of the results, but also to encourage scientific researchers to show independent thinking, pioneering spirit and innovative ability in the process of scientific and technological innovation, emphasizing the depth and quality of technological achievements.

Secondly, we should attach importance to the practicability and application effect of scientific and technological achievements. The evaluation of scientific research achievements should not only pay attention to the intrinsic value of science, but also consider its actual contribution to social and economic development. The evaluation index system should fully consider the practical application effect, technology transformation and industrialization ability of scientific and technological achievements, and encourage researchers to make contributions in solving practical problems and meeting social needs.

Thirdly, it emphasizes the long-term value and sustainable development of scientific research achievements. The evaluation index system of scientific research should consider the long-term impact and sustainability of scientific and technological achievements, avoid excessive attention to short-term achievements and instantaneous effects, pay attention to the long-term development potential, academic influence and sustainable innovation ability of scientific research projects in the evaluation process, and encourage researchers to think and practice from a long-term perspective.

3.4 Establish a Diversified Achievement Evaluation System to Enhance the

Objectivity and Scientificity of the Evaluation Results

The establishment of diversified achievement evaluation system is an important guarantee to enhance the objectivity and scientificity of the evaluation index system, which is conducive to reducing the subjectivity of the evaluation results and providing more accurate and comprehensive evaluation results for scientific researchers.

On the one hand, to establish a diversified achievement evaluation system, it is necessary to determine multiple evaluation dimensions and indicators. The evaluation index system should include multiple evaluation dimensions, such as the innovation, practicability, social influence and academic influence of scientific research achievements. Each evaluation dimension should have corresponding quantitative indicators for objective evaluation and comparison. Through multi-dimensional evaluation, we can understand the quality and value of scientific and technological achievements more comprehensively.

On the other hand, the establishment of a diversified outcome evaluation system should adopt a variety of evaluation methods and tools. In addition to the traditional evaluation methods, other evaluation methods and tools can be introduced, such as academic paper scoring, expert evaluation, user satisfaction survey, practical application effect tracking, etc. Different evaluation methods and tools can obtain data and information from different perspectives, reduce the influence of subjective factors, and provide more comprehensive and objective evaluation results.

In addition, to establish a diversified achievement evaluation system, we should also establish a horizontal and vertical comparison mechanism for the evaluation of scientific research achievements. By comparing with the relevant scientific research achievements in the same field, we can better evaluate the advantages and disadvantages and uniqueness of scientific and technological achievements. Horizontal comparison can help identify the gap and competitiveness of scientific and technological achievements and encourage researchers to do more innovative work. Longitudinal comparison can track the development and change of scientific and

technological achievements and evaluate their sustained contribution and influence.

3.5 Strengthen the Confidentiality of Evaluation Materials and Establish an Efficient Management Mechanism for Evaluation Materials

Strengthening the confidentiality of evaluation materials and establishing an efficient management mechanism of evaluation materials are the key measures to enhance the objectivity and scientificity of the evaluation index system, which is conducive to protecting the safety and confidentiality of evaluation materials and ensuring the reliability and accuracy of the evaluation process.

It is necessary to establish a classification and grading system for evaluation materials. According to the sensitivity and confidentiality requirements of the evaluation materials, the evaluation materials can be divided into different levels and classifications. On the one hand, for highly sensitive evaluation materials, more stringent confidentiality measures and authority management should be taken to restrict the access and use of evaluation materials; on the other hand, for ordinary sensitive evaluation materials, corresponding confidentiality measures should also be set up to ensure the security of evaluation materials.

The access and use control of evaluation materials should be strengthened. Relevant evaluation subjects and institutions shall establish strict access control mechanisms to allow only authorized personnel to access and use evaluation materials. This includes establishing appropriate authentication and permission management mechanisms to ensure that evaluation materials can only be accessed and operated by authorized personnel. In addition, relevant regulations and procedures shall be established to clarify the access and use requirements of evaluation materials, and access permissions shall be regularly reviewed and updated.

Physical and digital security measures for evaluation materials should be actively applied. The assessment organization shall take physical security measures, such as the establishment of security areas, monitoring systems and security protection measures for storage equipment, to prevent the loss, damage or leakage of assessment materials.

For digital evaluation materials, technical means such as encryption and secure transmission should be adopted to ensure the security of evaluation materials in the process of transmission, storage and processing.

4. Conclusion

Aiming at the problems of the evaluation index system of applied scientific and technological achievements, this paper puts forward some strategies, such as updating the evaluation expert database in time, establishing and perfecting the supervision system, establishing correct values of scientific and technological achievements, establishing a diversified evaluation system of achievements and strengthening the confidentiality of evaluation materials. The implementation of these strategies will effectively improve the scientificity, objectivity and credibility of the evaluation index system. It provides a more accurate and comprehensive basis for the evaluation of applied scientific and technological achievements.

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