

Research on the Problems and Innovation system in the Management of Science and Technology Talent Plan

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Abstract: In view of the current scientific and technological talent planning management system, the unknown positioning of scientific and technological talent leads to the low execution of scientific and technological innovation, and the new scientific and technological talent planning management system is proposed. Based on the actual situation of science and technology talents' management, this paper probes into the superficial features and internal inducements of the low execution of science and technology innovation of science and technology talents. Based on the analysis results, PEST and DEA analysis methods are used. Based on the surrounding environment and its own factors of scientific and technological talents, the scientific and technological innovation ability of talents is taken as the decision-making unit to conduct data envelopment analysis, and the execution of scientific and technological strategies of scientific and technological talents and relevant linear relations are clarified. According to the internal and external environmental factors, select the strategic objective that matches the executive ability of current scientific and technological talents, improve the supporting measures of scientific and technological strategies in all aspects, and realize the construction of scientific and technological talent plan management system. Experimental research shows that compared with the traditional management system, the new scientific and technological innovation management system with the application design, the comprehensive scientific and technological execution ability of scientific and technological talents is improved by more than 25%, which has practical advantages.

Keywords: Technical talents; Planning management; Innovation system; Strategic safeguards

1. Introduction

With the rapid development of science and technology, human society begins to enter the era of knowledge economy. The 21st century is the era of economic globalization, and the economic ties between countries are increasingly close. On the surface, this competition is the competition of economic resources, product quality and market share. In fact, it is the competition of human capital and knowledge technology. Human scientific and technological capital has become the decisive factor and main driving force for economic growth. Since the reform and opening up, China's economy has developed rapidly and people's living standards have been continuously improved^[1]. However, this kind of economic growth is based on the extensive mode of growth. In the new round of economic growth, China's economic resource supply has become increasingly tight. In this situation, "enhancing the capacity of independent scientific and technological innovation" has been promoted to the height of national economic development strategy. The key to improve the ability of independent innovation is to create a talented team with strong independent innova-

tion ability. It can be said that the construction of talent team is a "golden key" to break the dilemma that key technologies are subject to control and realize the transformation of economic growth mode. At the present stage, the trend of internationalization and marketization of scientific and technological talents is increasingly strengthened. Developed countries, relying on their strong economic and scientific and technological strength, are stepping up efforts to attract high-tech talents and senior management talents globally. China's outstanding talents have always been one of the priorities for the developed countries to compete for. The construction of scientific and technological talent resource management innovation ability is more and more decisive in the competition of comprehensive national strength. The development of knowledge economy challenges the development of human resources, especially the construction of talent innovation ability. Traditional Chinese science and technology talent planning management lack of effective statistical strategy, it is easy to lead to the lack of talent execution, in order to solve the drawbacks of core, designed the new talent management innovation system of science and technology, through comprehensive evalua-

tion talented person's capacity for independent innovation of science and technology, make matching strategy system and safeguard mechanism, improve the scientific and technological personnel executive force, thus to provide a talent competition of science and technology in our country in the future^[2].

2. Problems Existing in the Management of Technology Talent Plan

For a long time, the overall value creativity of China's science and technology talents has been out of proportion to their own ability. Through the research, it is found that the core reason lies in the problems such as the existence of scientific and technological talent management system, unclear analysis of talent strategy execution, and unclear strategic collaboration. In general, it is impossible to motivate the execution of scientific and technological strategies through appropriate strategic management system, thus resulting in a low execution of scientific and technological strategies^[3]. The following is a practical analysis of the low performance and reasons of science and technology execution ability of science and technology talents:

First of all, the self-value of scientific and technological talents is not enough. According to maslow's hierarchy of needs theory, there are five levels of human needs: physiological, safety, social, respect and self-actualization. When the lower needs are met, the higher needs will appear, and then the satisfaction of the lower needs will be satisfied. In general, high-tech talents pay more attention to the career development space and the reflection of their own value. However, at the present stage, the management system of science and technology talents cannot formulate appropriate strategic goals, resulting in insufficient career development space for professional and technical personnel, and no obvious advantages compared with management personnel in terms of functions and income. The simple and extensive traditional man-

agement mechanism can hardly reflect the self-value of scientific and technological talents, and is suitable for the talent demonstration of experts^[4].

Secondly, the value orientation of experts is not clear. Relatively speaking, scientific and technological talents have strong independent scientific and technological innovation ability. This independence is reflected not only in the personnel category, but also in the subject category. If the scientific and technological talent management system cannot analyze the existing executive force categories of talents, it will be difficult to manage them effectively. As a result, it is difficult to give full play to the talents, leading to underperformance. Aiming at the above two core reasons, the design starts from the analysis of scientific and technological innovation ability of talents, and proposes the innovative system of new scientific and technological talent plan management through strategy formulation and logistics support^[5].

3. Construction of Scientific and Technological Talent Plan Innovation System

Aiming at the actual problem of the lack of executive ability caused by the improper management of the current scientific talent plan, an innovation system for the management of scientific talent is designed based on the current practical situation. This analysis process needs to start with the environment and the talent itself. By using DEA data envelopment method and PEST analysis method, the linear relationship of the executive force of current scientific and technological talent is clarified. Based on the actual executive force and decision-making efficiency of current talents, select appropriate talent strategy types according to current internal and external factors. Finally, it further improves the strategic security measures for scientific and technological talents, and realizes the construction of scientific and technological talents plan management. The overall structure is shown in figure 1^[6].

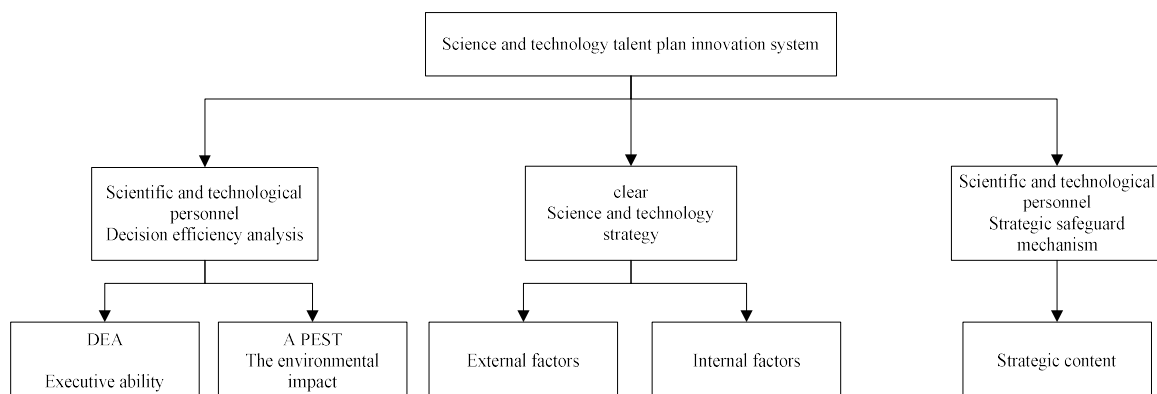


Figure 1. Schematic diagram of innovation architecture

In the innovation system, the key point lies in the efficiency analysis of scientific and technical talents decision. The analysis accuracy of this data directly affects the matching degree of the following improvement steps for the execution ability of scientific and technological talents.

Through the statistical calculation of the linear relationship between scientific and technical talents, the scientific and technological strategy that matches the implementation of li can be established according to the actual internal and external factors. The more accurate the decision-making efficiency analysis is, the more accurate the

strategic positioning is, and the appropriate scientific and technological strategy for talents can also react on the scientific and technological talents, promote the development of their executive ability, and improve the advantages of the talent management system^[7]. The designation of strategic guarantee mechanism for scientific and technological talents needs to be based on the content of scientific and technological strategies to ensure the normal operation of scientific and technological talents and strategic contents. The overall process is shown in figure 2.

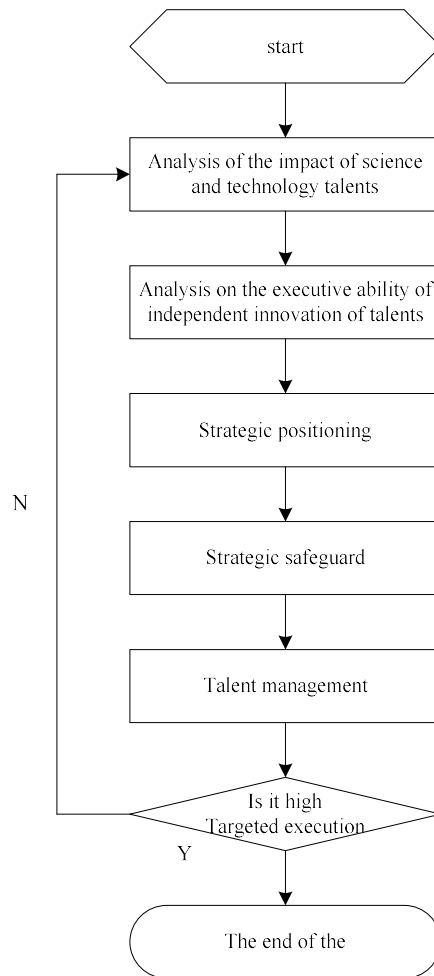


Figure 2. Schematic diagram of innovation architecture

3.1. Efficiency analysis of scientific and technical personnel decision - making

It is a complex process to evaluate the overall independent innovation ability and decision-making efficiency of scientific and technological talents. The development of high and new technology in a region is an important aspect to measure the independent innovation ability of scientific and technological talents in the region. The

DEA is designed to be applied to the evaluation of the industrial input and output of scientific and technological talents. Firstly, environmental factors affecting the executive ability of talents are analyzed. Based on the analysis results, the DEA analysis strategy is used to clarify the decision-making efficiency of current scientific and technological talents. It is expected to conduct in-depth research on the independent innovation ability and self-

development of scientific and technological talents, and indirectly analyze the overall situation of scientific and technological talent management and current adaptability of talents in this region. PEST analysis is needed to analyze the impact of environmental factors on the executive ability of scientific and technological talents. The talent environment here mainly refers to the external environment, namely the macro environment: refers to

the various macro forces affecting all industries and enterprises. The PEST analysis method is used to analyze the main external environmental factors influencing scientific and Technological talents from four categories: Political, Economic, Social and Technological. The overall analysis framework is shown in figure 3^[8].

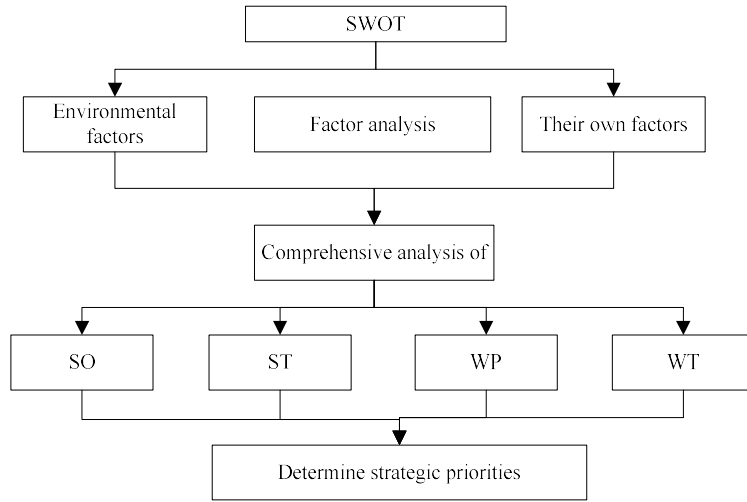


Figure 3. PEST analysis frame diagram

Based on the analysis of the data will affect the universality of scientific and technological personnel factors can be summarized as^[9]: wages S1 and S2 mobility, RD, S3 enterprise overall competitiveness, S4 area overall development level, S5 cultural environment, S6 talent aggregation ability, S7 political system, the S8 education status, the integrated research institute, S10 self-employment wishes, S11 innovations forage-livestock system speed 12 degree of marketization, / S13 talent quantity, quality/S14 talents^[10], S15 enterprise talent. According to the correlation analysis of the above factors, the correlation chart is developed as shown in figure 4^[11].

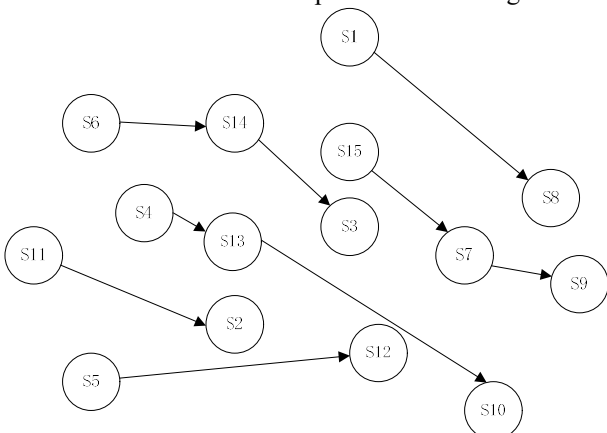


Figure 4. Connecting chart of related factors of technical talents

According to the connection diagram of figure 4, 15 adjacent matrices can be established:

$$(adjacencymatrix)A = [a_{ij}]_{15 \times 15} \quad a_{ij} = \begin{cases} 1 & S_i RS_j \\ 0 & S_i \bar{R}S_j \end{cases} \quad (1)$$

In formula (1), $S_i RS_j$ means : S_i can directly derive S_j . According to formula 1, corresponding interpretation data can be obtained through interlevel division^[12]. According to the above evaluation indexes^[13], the independent innovation ability and executive ability of scientific and technological talents can be objectively evaluated and the evaluation results can be obtained^[14].

3.2. Clearly position science and technology strategy

The strategic choice of scientific and technological development is the process of making strategic choice and determining strategic priorities in the strategic combination of scientific and technological talents development with the guiding ideology and strategic goal of comprehensive consideration. The specific operation is to quantify the opportunities and threats in the external environment by using the external factor evaluation matrix (EFE) and to analyze its advantages and disadvantages by using the internal factor evaluation matrix (IFE). According to the quantitative evaluation results of internal and external factors of EFE and IFE matrix, the strategy of science and technology was defined through the strategic positioning model of the improved IE matrix.

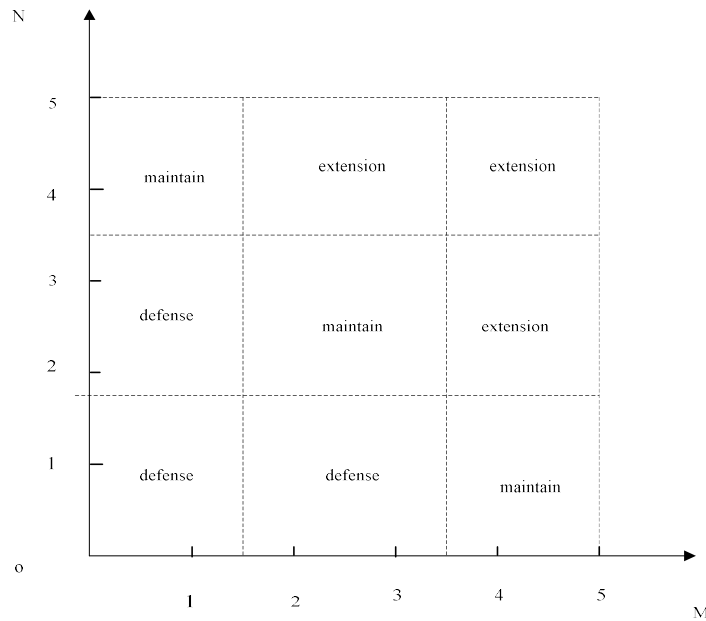


Figure 5. Scientific and technological strategic positioning map

3.3. Realize the construction of innovation system

The above process completes the positioning of scientific and technological talents' strategic execution and content. In order to ensure the normal operation of the innovation management system, it is necessary to further improve the strategic safeguard measures. The main contents are as follows:

We will rebuild and improve the system of scientific research institutions, improve the competitiveness of the scientific and technological talent team through "fixed positions, talent 'flow and competition", and closely link the talent reserve, development and utilization with the reintegration of the scientific research system. We will steadily support top-notch talents and excellent research teams engaged in basic and public welfare research, explore ways of funding innovative talents, and select a number of outstanding scientists and research teams for long-term and stable support. Give stable support to scientists who have achieved outstanding results and encourage them to explore freely according to their needs. Training excellent engineering science and technology talents based on practice for high-level engineering and technology talents should be combined with major tasks and engineering projects, through the combination of industry, education and research, and based on practice training; Universities and research institutes should be guided by various policies to work closely with new and high technology enterprises and enterprise groups to cultivate high-level practical engineering talents oriented to

needs and future by combining major tasks and projects. The key to scientific and technological management personnel is to make them professional. Adopting different evaluation and incentive policies to make managers relatively stable and professional; Set up a set of vocational training system including scientific and technological management personnel, such as enterprise CEO, school director, etc., implement on-the-job training and vocational assessment, and establish a scientific and technological management personnel training base and compile systematic scientific and technological management training materials; It is suggested to recruit the heads of research institutes at home and abroad in provincial research institutes, learn from the successful experience of foreign professors/researchers in universities and research institutes, and actively explore the system of research institutes council and the system of university professor committee. To cultivate senior technicians and talents supported by science and technology with the help of social forces: to cultivate senior technicians and talents supported by science and technology should rely more on social forces; We will support cooperation between enterprises and institutions of higher learning, encourage all sectors of society to establish and develop engineering and technical colleges, and train a large number of senior technicians and scientific and technological support talents who have mastered basic scientific theories and development skills to meet the needs of social and technological development and industrial development.

4. Experiment Inquiry

The above process has completed the construction of the innovation system of scientific and technological talent plan management. In order to verify whether the designed innovation management system can effectively improve the scientific and technological execution of scientific and technological talent, a practical comparison is made. The experiment takes the scientific and technological data in a core scientific and technological energy database as the experimental sample, conducts the execu-

tion comparison, and sets up the experimental group and the comparison group. Let the experimental group select the designed new management system and the comparison group select the traditional management system to conduct scientific and technological research on the same scientific and technological sample. By verifying their scientific and technological achievements, the scientific and technological execution of the two groups is compared. The experiment period is set to 3 months. Experimental environmental capital assessment is shown in table 1.

Table 1. Experimental Environmental Capital Assessment

Year	Cultural Education	Evaluation of Science and Technology	Number of Experimental Environment	The Urban Population	Value of Urban Science and Technology
2010	189.75	68.25	80759	201587	2060.15
2011	192.35	87.36	70698	198533	2268.58
2012	215.58	135.25	77526	201458	3021.25
2013	219.77	170.63	79026	225895	3127.25
2014	288.56	189.69	75485	236658	2844.59
2015	301.25	120.63	77682	240598	3575.63
2016	315.75	135.36	72168	256987	2957.26
2017	343.25	147.25	70158	223696	3275.25
2018	350.19	159.69	77359	210585	3135.55

According to the above data samples, the experimental group and the comparison group were allowed to carry out scientific and technological research and development on the experimental samples at the same time, and

the research and development progress of the experimental group and the comparison group was recorded in 15 days as a recording unit. According to its development progress. The results are shown in table 2.

Table 2. Experimental Environmental Capital Assessment

Time Unit	Number of Trials	Contrast Group Execution	Performance Evaluation of Experimental Group	Contrast Group Performance Evaluation
1	17	10	B	C
2	35	29	B	C+
3	55	45	B+	C++
4	78	60	B++	C+
5	90	71	B	B+
6	120	100	A+	B

It can be clearly seen from the data in table 6 that the performance of the experimental group was significantly higher than that of the contrast group after the application of the new innovative management system. In order to reflect the differences between the two groups, the experimental results were prepared into a broken line diagram, as shown in figure 6.

In order to improve the observation, fig.6 sets the time unit to 10. Since the executive force cannot be directly compared, the experiment obtained the research data through the data measurement software, and proposed the executive force evaluation before the evaluation. According to the data in figure 6, it can still be confirmed that the combined execution of such group is higher than that of the contrast group. The superiority of the system can be judged.

5. Conclusions

With the increasingly intensified international competition in China, scientific and technological talents are of great importance to the sustainable, rapid and coordinated development of China's science and technology. On the basis of fully studying the theories and practices of strategic theory, human resource management, talent science and psychology, the design establishes a modern scientific talent management system, improves the scientific, systematic and operational nature of scientific talent management, and reaches the following conclusions for the realization of the overall strategic service of petroleum enterprises.

With the rapid development of science and technology in our country, the demand for science and technology talents keeps increasing. As the development of science and technology in China has been affected by planned economy for a long time, it is still in the transition stage from personnel management to human resource management,

which hinders its participation in market competition. It is urgent and necessary to strengthen the research on human resource management of scientific and technological

talents and establish an effective management system for them.

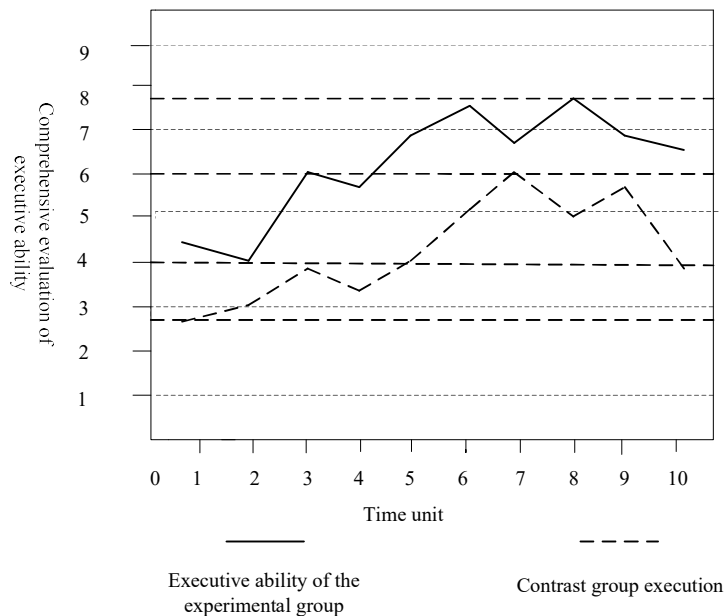


Figure 6. Executive force comparison chart

Scientific and technical talent is a relative and dynamic concept, which can only be judged in comparison and specific situations. The characteristics of scientific and technical talents different from the stock of talents determine that the management and use of scientific and technical talents are special and should be studied separately. In the practice of science and technology talent management, we should adhere to the principles of development demand, gradual progress, complementary value-added, moderate reserve, and individual and organization fit. The existence of scientific and technological talents is universal and management use is special. In the national medium and long term talent development strategy, it is of great and far-reaching practical significance to do a good job in the management of enterprise scientific and technological talents. To attract scientific and technological talents and activate them with scientific and technological talents, attention should be paid to the introduction of scientific and technological talents, and efforts should be made to train and develop them so as to give full play to the role of various kinds of talents, realize their own value and improve their efficiency.

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