

# The Current Situation and Management Considerations of Achievement Transformation in Affiliated Hospitals of Universities under the New National System

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**Abstract:** Objective: The purpose of this study is to explore the new situation and difficulties of achievement transformation under the new national system, as well as explore the new methods of achievement transformation management in affiliated hospitals of universities. Method: By analyzing the data from the Chinese Patent Investigation Report in 2022, the China's Hospital Reputation Rankings, the China's Hospital Ranking of Innovation and Transformation, and some representative reports on the output and transformation of achievements in affiliated hospitals of universities in recent years, combined with the relevant requirements of the 20th National Congress of the Communist Party of China, this study explores the management methods for creating a good ecosystem of innovation and transformation in affiliated reproductive hospitals of universities under the new national system, and promoting high-quality development of hospitals through the transformation of scientific and technological achievements. Result: The new national system provides important institutional guarantees for accelerating scientific and technological breakthroughs and achievements transformation. High value patent applications and achievement transformation in scientific research institutions in China have received more attentions and supports. As the backbone of the output of medical technology achievements in China, affiliated hospitals of universities still have an effective patent transformation rate far below the domestic average level. The achievement transformation work in affiliated hospitals of universities is limited with incomplete internal mechanisms, lack of experience in transformation by scientific researchers, and unfavorable factors such as a lack of external intermediary agencies. As a result, the achievement transformation work would be long-term. Conclusion: Affiliated hospitals of universities should optimize top-level design, strengthen major scientific research breakthroughs, improve achievement transformation management teams, build achievement transformation training platforms, establish and improve achievement transformation mechanisms, clarify performance evaluation rules for achievement transformation, broaden organizational forms, stimulate innovation vitality in achievement transformation, and achieve organic integration between enterprises, hospitals, and related research institutions, in order to create a new highland of scientific and technological innovation and achievement transformation.

**Keywords:** Affiliated Hospitals of Universities; Technological Achievements; Achievement Transformation; Scientific Research Management.

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## 1. Introduction

According to the China Patent Survey Report 2022 issued by the China National Intellectual Property Administration, from 2018 to 2022, the effective patent industrialization rate of China has increased from 36.3% to 45.0%, showing a steady increase. Among them, the effective patent conversion rate of enterprises has reached more than 45% stably, while the effective patent conversion rate of scientific research institutions in the past five years is only 8.9%-18.3%, and the effective patent conversion rate of universities is 2.3%-3.5%. In 2022, the effective patent conversion rate of scientific research institutions declined 1.6 % compared with the previous year [1]. As the backbone of China's medical technology achievements, the effective patent conversion rate of university affiliated hospitals is still far below the domestic average level.

## 2. The Current Situation and Challenges of Achievement Transformation in Affiliated Hospitals of Universities

In November 2023, the Fudan Version of 2022 China's Hospital Ranking was released. Among the top 100 hospitals in the national comprehensive affiliated hospitals of universities ranked over 80%. The affiliated hospitals of universities have integrated advantage resource of clinical and university, occupying the unique and advantageous position in scientific research, talent cultivation, academic exchange, and so on. According to the "China's Hospital Innovation and Transformation Ranking (2022)", the total number of patent applications and authorizations in tertiary hospitals has decreased by 34% and 40% respectively compared to the same period of 2021. The total number of invention patent applications and authorizations has increased by 20%, and the total number of patent licenses has increased by more than 80%. High value patent applications and achievement transformation in tertiary hospitals have received more attention and support [2].

Affiliated hospitals of universities provide the complete research channel that includes clinical needs, basic research, output of results, and clinical applications objectively for scientific researchers. The hospital continuously explores needs and inspirations from clinical diagnosis and treatment experience, and collaborates with domestic and foreign clinical centers to carry out multi center RCT research. In addition, university platforms could provide a research environment based on discipline construction and supported by scientific research projects, allowing researchers to conduct basic research and promote the output of results orderly.

The transformation of achievements in affiliated hospitals of universities still faces many problems, such as lack of awareness and experience of scientific researchers[3]. Most researchers promote their professional titles by publishing papers. Some researchers lack experience in patent applications and the correct order between patent application and paper submission, which leads to the inability of authorize patents. Secondly, hospitals lack professionals in the achievement transformation market, and the achievement transformation system is not yet mature[4]. Most affiliated hospitals of universities have gradually improved their achievement transformation mechanisms and reward policies, established transformation centers, and conducted training courses to promote achievement transformation, which is still in the development stage. According to publicly available data from a tertiary hospital affiliated to a certain university in Beijing, over 630 SCI papers were published and over 350 patents were applied for in 2021. There is still a significant gap between the number of patent applications and the number of publications. In 2022, the hospital applied for 550 patents, with a significant increase in patent applications. However, the proportion of patent conversions (over 60) has not increased compared to the previous year (over 50). Thirdly, there is a lack of external factors such as intermediary agencies and special support funds for achievement transformation among research personnel in hospitals affiliated to universities. Enterprises have insufficient motivation for scientific and technological innovation and concerns for risk control. External factors are also key factors which limited achievement transformation in affiliated hospitals of universities.

### **3. The Promotion and Requirements of the New National System for the Transformation of Achievements**

The report of the 20th National Congress of the Communist Party of China pointed out that "we will improve the new national system and strengthen the national strategic scientific and technological strength". The new national system provides important institutional guarantees for accelerating the realization of scientific and technological public relations and the transformation of achievements[5]. Since the establishment of a scientific and technological innovation system in the country and the acceleration of the implementation of the innovation driven development strategy, governments at all levels have taken positive measures to lead population health, scientific and technological innovation. In recent years, the Ministry of Science and Technology has made successive reforms for major national research and development projects. The national key research and development plan projects have

fully implemented the "unveiling and commanding" mechanism, encouraging confident and capable teams and academic leaders to organize key core technology breakthroughs which guided by national strategic needs, to comprehensively drive young scientists to do scientific research. At the same time, young scientist projects will be established on a larger scale, and key special projects will be implemented through ministerial and provincial linkage, which could further explore the implementation of technology readiness management and significantly improve the overall innovation performance of the national science and technology plan. On the other hand, intellectual property protection centers in various regions have established relatively complete functional structures, which has greatly shortened the examination and authorization cycle of intellectual property rights. At the same time, they have played an important role in rapid patent protection and navigation warning[6]. The 20th National Congress of the Communist Party of China requires the formation of demand oriented original technological breakthroughs, enterprise led deep integration of industry, academia and research, and comprehensive improvement of achievement transformation and industrialization level. Local governments should fully leverage their functional responsibilities, promote school enterprise cooperation, strengthen the construction of intermediary service systems, establish special channels for achievement transformation, coordinate and solve problems and difficulties in achievement transformation, and provide a good policy environment for the implementation of achievements. Local enterprises are vigorously improving their level of scientific and technological research, breaking away from traditional development paths, and promoting enterprise transformation and upgrading, while affiliated hospitals of universities are strengthening policy innovation and elevating the transformation of achievements to unprecedented heights. Efforts should be made to build a "Trinity" achievement transformation platform for the government, universities, and enterprises.

## **4. Exploration on the Transformation and Operation of Achievements in Affiliated Hospitals of Universities**

The transformation of scientific and technological achievements has played an indispensable role in improving the medical quality, enhancing comprehensive strength, and accelerating the cultivation of innovative talents in affiliated hospitals of universities[7]. Here, we reviews and explores the achievement transformation work of university affiliated hospitals under the new national system.

### **4.1. Optimizing Top-Level Design and Strengthening Major Scientific Research Breakthroughs**

The output of scientific research achievements is always an important foundation for the transformation of achievements. Affiliated hospitals of universities should be based on clinical disciplines and scientific research projects, strategically layout the direction of innovation transformation, and strengthen the transformation of medical research results into actual productivity from the root. By analyzing the current situation of the industry Comprehensively, exploring the clinical application needs deeply, optimizing the reward mechanism for scientific research project application, and

strengthening technical public relations, problems are oriented and key problems such as "bottleneck" are focused on, to solve practical problems in basic research and clinical diagnosis and treatment, carry out leading scientific research, break through bottlenecks, and promote the incubation of high-value scientific research achievements.

#### **4.2. Improve the Achievement Transformation Management Team and Build a Practical Training Platform for Achievement Transformation**

The cultivation and training of technical managers are crucial for improving the efficiency of technology transfer and transformation in affiliated hospitals of universities [8]. The department of achievement transformation should broaden the professional scope of personnel, establish a talent training mechanism for scientific and technological achievement transformation, and introduce specialized talents for achievement transformation. Fully developing professional collaboration in order to cover clinical application research talents, management talents, legal and financial related professionals. The achievement transformation management team should actively organize high-value patent training. And the management and R&D personnel should fully play their roles in technical research and development, patent navigation, patent layout, patent application, patent management and operation, and other activities[9]. At the same time, affiliated hospitals of universities should actively integrate social resources, collaborate with cooperative enterprises to build achievement transformation alliances and bases, then gradually build achievement transformation training platforms, which could provide solid guarantees for the smooth realization of innovative transformation.

#### **4.3. Establish and Improve the Mechanism for Achievement Transformation, Clarify the Performance Evaluation Rules for Achievement Transformation**

Affiliated hospitals of universities should further improve the achievement transformation sharing plan and strengthen the reward intensity for achievement transformation. Establishing an effective and standardized intellectual property management system and process, as well as accelerating the construction of intellectual property system informatization, in order to further achieve data sharing of intellectual property informatization throughout the hospital[10]. Incorporating the transformation of achievements into the professional title assessment of departments and research personnel, and the professional title promotion mechanism will favor those who have completed the transformation of achievements, and special rewards will be given to the advanced departments in the transformation of achievements. Scientific researchers can submit transformation applications to functional departments. After being reviewed by functional departments or scientific and technological achievement transformation teams, they can apply for special funds to promote the implementation of transformation by establishing a special fund for achievement transformation. We look forward to breaking down financial barriers to hospital scientific and technological achievement transformation, and achieving organic integration between enterprises, hospitals, and related scientific research institutes

by means of the above measures[11].

#### **4.4. Expand Organizational Forms and Stimulate the Vitality of Achievement Transformation and Innovation**

Affiliated hospitals of universities can organize various activities such as achievement transformation competitions within the hospital to fully mobilize the enthusiasm of scientific researchers for transformation. Establishing special channels such as "achievement mailbox" and "patent clinic", in order to actively lead clinical and scientific researchers to propose research and development ideas, organize discussions in the transformation team, and provide improvement plans. The entire process of achievement research and development, authorization, and transformation could be followed up on by providing "project managers" for executable projects. If we create a good innovation and transformation ecosystem, the high-quality development of hospitals through the transformation of scientific and technological achievements would be promoted.

Although the transformation of achievements in affiliated hospitals of universities is currently in a stage that requires long-term development owing to the incomplete policy systems, insufficient investment in special funds and relatively scarce transformation channels, their scientific and technological innovation capabilities are always beyond doubt. In the past five years, medical technology innovation represented by affiliated hospitals of universities has made significant progress. With the efforts of the government, universities, and enterprises, affiliated hospitals of universities, as the main force of scientific and technological research and development in the biomedical field, will undoubtedly achieve new heights in the energy efficiency of high-quality achievement transformation.

## **References**

- [1] China National Intellectual Property Administration China Patent Investigation Report 2022 [R/OL]. [https://www.cnipa.gov.cn/art/2022/12/28/art\\_88\\_181043.html](https://www.cnipa.gov.cn/art/2022/12/28/art_88_181043.html).
- [2] Li Li, Zhang Ning. Reflection on Building a System for the Transformation of Hospital Science and Technology Innovation Achievements Based on Patent Information Analysis [J]. Chinese Hospitals, 2023,27 (05): 83-86.
- [3] Fan Jie, Zheng Yang, Liu Mifeng et al. Research on the Development Strategy of Science and Technology Work in Third level Traditional Chinese Medicine Hospitals Based on SWOT Analysis [J]. Journal of Traditional Chinese Medicine Management, 2023,31 (11): 5-7.
- [4] Li Li, Zhang Ning. Reflection on Building a System for the Transformation of Hospital Science and Technology Innovation Achievements Based on Patent Information Analysis [J]. Chinese Hospitals, 2023,27 (05): 83-86.
- [5] Chen Shiwei. Utilizing the Role of the United Front to Improve the New National System [J]. Jourual of Shanghai Institute of Socialism, 2023 (04): 101-108.
- [6] Jiang Guiping. Effective Strategies to Improve the Quality of Intellectual Property Protection Work [J]. Legality Vision, 2023 (18): 145-147.
- [7] Yu Yang, Wang Zhen, Li Yang, et al. Exploration of the role of technological achievement transformation in high-quality development of hospitals [J]. Chinese Journal of Medicine, 2023,58 (08): 926-928.

- [8] Jin Tongtong. Exploration of the Current Situation and Efficiency Improvement Strategies for the Transfer and Transformation of Scientific and Technological Achievements in Universities in the New Era [J]. Chinese University Technology Transfer, 2023 (07): 3-9.
- [9] Wang Huili. Research on high-value patent cultivation strategies in research-oriented hospitals [J]. Chinese Inventions and Patents, 2022, 19 (12): 53-60.
- [10] Tang Liman. Establishing an Intellectual Property Value Chain: An Effective Path for the Transformation of Hospital Science and Technology Achievements [J]. Science and Technology of China, 2023 (06): 41-45.
- [11] Shi Weiwei, Yang Anchao, Li Yiyi. Research on the transformation of scientific and technological achievements in public hospitals and research institutes and countermeasures [J]. Chinese Hospitals, 2019,23 (11): 13-15.