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Research Article

Correlation and Influencing Factors of Technology Transfer and Independent Innovation Based on the Data Acquisition and Monitoring System

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Since 2007, China's economic growth has slowed down. China's economic growth rate is declining. Demand stimulus is ineffective. Therefore, it emphasizes the important role of technology transfer and independent innovation. The main socioeconomic incentives for technology transfer and independent innovation today are the development of electronic technology, computer technology, and communication technology. Monitoring systems are more and more widely used in related fields. The processing of data sources is to meet the needs of real-time data collection and monitoring. The following conclusions are drawn through theoretical analysis and empirical research. The spatial technology transfer coefficients in the eastern, central, and western regions are positive, reaching 0.2129, 0.1639, and 0.2829, respectively, passing the 10%, 1%, and 5% significance tests, respectively. This shows that the regional independent innovation potential can also support the improvement of the independent innovation potential of regions with similar economic and social conditions. Industrial transfer can not only improve the independent innovation potential of the region but also increase the independent innovation potential of neighboring regions and regions with similar economic and social conditions due to the spatial effect. The impact of industrial transfer on the capability of independent innovation varies from region to region. The role of industrial spillover effects in the eastern region in enhancing the capability of independent innovation is greater than that in the western region. However, in the central region, the industrial spillover effect has no significant impact on the capability of independent innovation. The data collection and monitoring system has greatly improved the efficiency and accuracy of the research on the correlation between industrial transfer and independent innovation.

1. Introduction

Looking at the world, industry-university-research cooperation, as an effective technology transfer method, has become an important part of the innovation system of today's developed countries. Since the last century, industry-university-research cooperation has played an increasingly important role in economic, technological, educational, and social development and has been highly valued by all countries. The United States has consolidated and defended its hegemonic position in the world economy and science and technology by building multilevel, multiform, and large-scale industry-university-research cooperation. Japan relied on unique industry-university-research collaborations, such as trust studies, joint research centers, and scholar donations, to rapidly develop its postwar economy. In addition, the rapid economic growth of the United Kingdom, Germany, France, Israel, and other countries has also benefited from long-term industry-university-research cooperation [1–3]. In China, due to various reasons, the long-standing separation of technology transfer research has seriously hindered the development of innovation in China. With the deepening of reform and opening up, the important role of industrial transfer cooperation in innovation consciousness has gradually been paid attention to. It has started to organize and implement the discussion on technology transfer and is gradually promoting the fast track of industry-university-research cooperation, further promoting the advancement of industry-university-research technology transfer. At the annual science and technology conference, the new task of construction is clearly put forward. At the same time, it emphasizes the combination of scientific research and research and also encourages the establishment of joint research and support of R&D institutions, industrial technology alliances, scientific research institutions, and other technological advancements of universities [4–6]. It accelerates the establishment of a technological transformation system that takes the market as the main body and combines technology transfer, leads and supports innovation, and promotes the transformation of scientific and technological achievements into real productivity. These measures have elevated China's industrial transfer and independent innovation technologies to new heights.

The article studies the relevance of using data acquisition and monitoring systems to bring about technology transfer and independent innovation. Dong et al. proposed a new data acquisition method called Reliability and Multipath Encounter Algorithm (RMER) to meet reliability and energy efficiency requirements [7]. Cheng et al. proposed a concurrent data collection tree specially designed for IoT applications. Compared with the existing single-user data collection structure, the system with the proposed tree structure can significantly shorten its concurrent data collection process [8]. Aditi suggested the use of crowdsourcing as a possible mechanism to engage a large number of stakeholders, which is used for data collection from a wide range of stakeholders in various projects [9]. Zheng et al. believed that as a special application of delay tolerant networks (DTN), efficient data collection presents some unique challenges due to the need for timely data collection reports and reduced transmission delays [10]. Luo et al. first investigates the challenges of privacy-preserving data collection. A practical framework, privacy-preserving data collection, is then proposed to prevent these types of attacks [11]. State-of-the-art data acquisition methods proposed by Bhuiyan et al. that improve these constraints do not meet application-specific requirements, for example, high-quality data (QoD) acquisition or quality monitoring (QoM) [12]. However, the above-mentioned use of data acquisition and monitoring systems has not been recognized by the public due to insufficient standard operation and insufficient test scope.

The first purpose of this paper is to study the spatial correlation of technology transfer; that is, whether technology transfer is related to the distance between regions and the influencing factors of independent innovation and industrial transfer in two adjacent regions. The second is to study the influencing factors of regional technology transfer. On the basis of previous research, if regional technology transfer has spatial correlation, that is, when analyzing the influencing factors, the distance and mutual influence of adjacent regions should be considered; that is, the spatial econometric model should be used. If regional technology transfer is spatially uncorrelated, general econometric models can be used when studying influencing factors. Science and technology is an important means for the rapid economic growth of various regions. Whether the technology transfer can be carried out smoothly is directly related to whether the regional economy can develop in a balanced way.

Due to the limitation of ability and access to data, there are still shortcomings in the previous research, which needs to be further improved in the research. Previous studies currently have no overall macro data to choose from and, therefore, can only rely on limited sample surveys to derive the overall data. There may be some deviations from the actual situation, and there are certain limitations in interpretation. At the same time, the mode of technology transfer is also an important factor affecting the effect of technology transfer. Most studies have not conducted in-depth research [13]. However, it is hoped that the results of this paper will attract more attention from the business community and the scientific and technological community to the technology transfer activities of production, education, and research in different agricultural sectors and then accelerate the innovation and development of agriculture [14]. Therefore, the research uses the data acquisition and monitoring system to analyze the correlation and influencing factors of technology transfer and independent innovation, which makes the experimental results more accurate [15].

2. Methods

2.1. Overall Design of the Data Acquisition and Monitoring System

2.1.1. System Functions. The wireless sensor network real-time data acquisition and monitoring system is not limited to a specific geographical location or scene. Using the Internet, through the system for real-time monitoring, users can remotely see real-time images or video scenes in different geographical locations and can obtain real-time monitoring data of the current scene.

The functional frame structure of this system is shown in Figure 1, which mainly includes the real-time information system, real-time video monitoring system, real-time data information system, and personnel management system. The real-time map information system is to display the specific geographic location to the user through the map. By imitating the function of the map, the user can search for the specific geographic location on the map, zoom in and zoom out the specific address, and mark the specific geographic location. The real-time video monitoring subsystem is to judge whether there is a camera through the information displayed on the page after the user finds the specific location and click the camera to enter the real-time video subsystem. Users can perform player operations such as playing, pausing, and taking screenshots of real-time video. Recording is also possible for real-time video. The video can be saved locally, and the next time the file is directly dragged to this video subsystem, the user can watch it again. The real-time data information subsystem is to judge whether the location belongs to the deployment range of wireless sensor network nodes through the page display information after the user finds the specific location. If it is within this range, the page can directly display the node information obtained by the wireless sensor network node. For the administrator, after knowing the information captured by the node, it also sets the node information of the node's

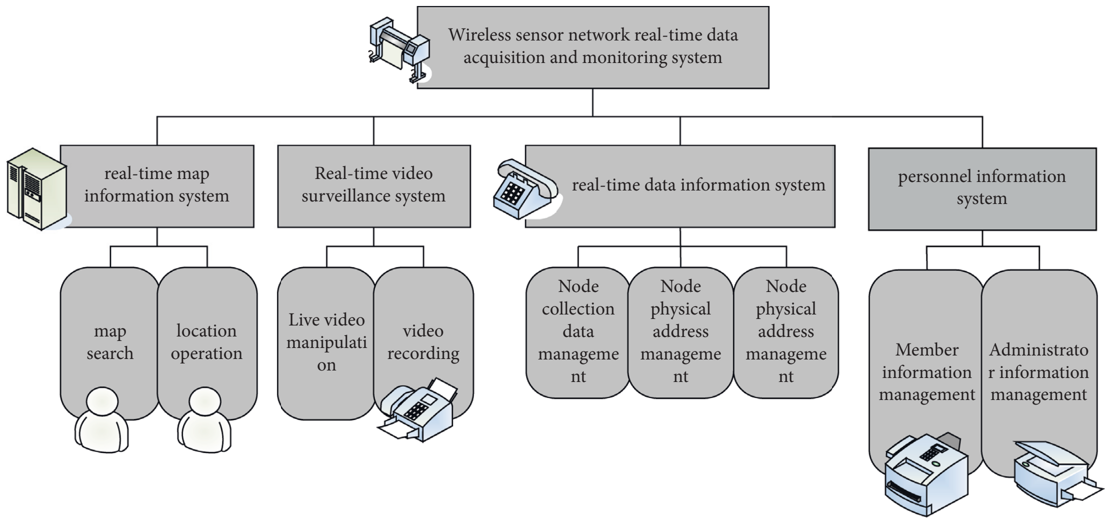


Figure 1: System functional framework.

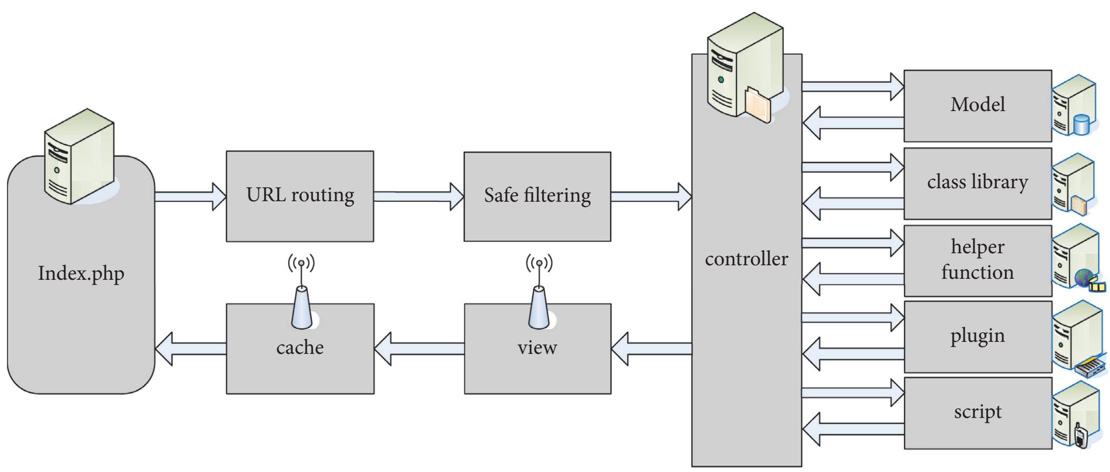


Figure 2: Schematic diagram of how the CodeIgniter framework works.

MAC address, actual physical address, and remaining power. The operation of adding, deleting, modifying, and checking the node information also prepares for better judgment of the effectiveness of the routing algorithm. The function of the personnel information subsystem is to count the information of users and administrators. Nonmembers can perform functions such as map search, but only after registration can they enter the real-time video monitoring subsystem and real-time data information subsystem to obtain information. The personnel information subsystem saves the member's registration information, such as user name, password, registration email, registration time, and other specific information. The administrator identity can operate the registered user information.

2.1.2. System Development Tools. The development language chosen for this system is PHP. PHP is a scripting language that is executed on the server side to embed HTML documents. The style of the language has the characteristics of the object-oriented language Java and the procedural language C-language at the same time. This is a big advantage of PHP language, and it is easy to learn and more and more popular by combining the characteristics of multiple languages.

MySQL is a database used in major platforms. SQL (structured query language) has evolved over decades to become a low-level conversational language for many platforms to interact with. This makes it easier to store, update, and access information, especially when combined with Apache and PHP, which is based on MySql. PHP has a complete MySql function, provides a powerful driver for building dynamic sites based on databases, and strongly supports MySql aggregation. Apache is open source HTTP server software that can run on most major computer operating systems (including Windows, UNIX, and Linux). Figure 2 is a schematic diagram of the working principle of the CodeIgniter framework.

CodeIgniter is based on the MVC design pattern. Views can be either be .php files or html files, sometimes called template files. M represents the model, which is used to connect with the database. Figure 3 is a schematic diagram of the working principle of MVC.

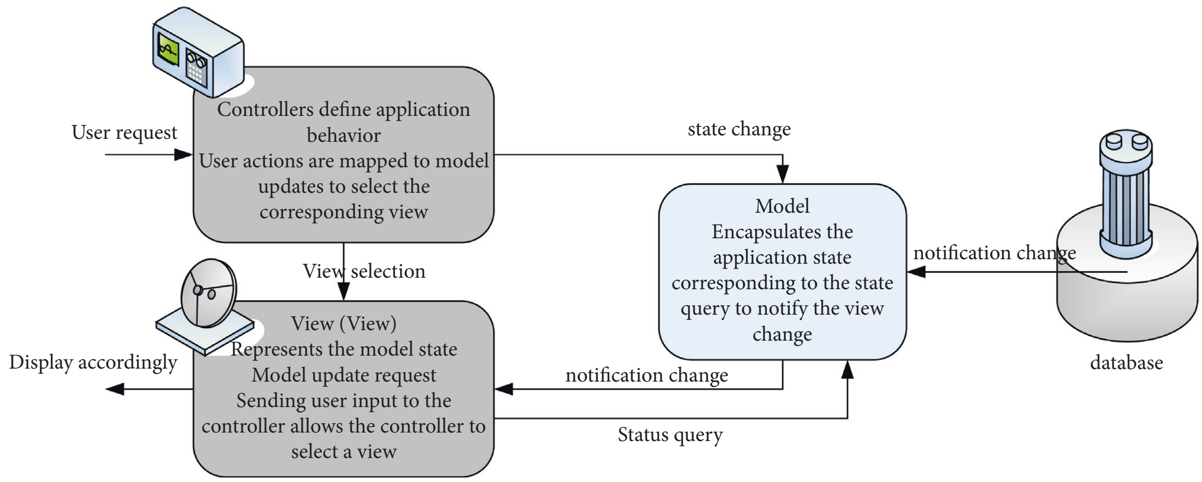


Figure 3: Schematic diagram of the working principle of MVC.

Design describes the overall design of the system. The first is the general analysis of the system function, and each functional module of the whole system is presented in the form of a schematic diagram. Second, the design of the whole system framework, database design, and use case diagram are presented, and each functional module of the system is clearly described. Finally, the system development environment and related technologies are introduced. PHP is a language development system, the database selected by the system is Mysql, and the server system is Apache. This system adopts the CodeIgniter framework and MVC pattern. The basic information of these three development tools and the reasons and advantages of using the three technologies in this system are introduced. At the same time, by understanding the working principle of the CodeIgniter framework and MVC, it can better understand the design process of this system.

2.1.3. Data Acquisition and Monitoring System Requirements. The realization method of the monitoring system of data acquisition is the distribution of multiple sensors and the detection of data changes, so the distribution mode and structure of the wireless sensor network play a crucial role in the efficiency and accuracy of the data acquisition and monitoring system. A wireless sensor network is a network of self-organized, distributed sensor nodes. The nodes in a wireless sensor network are usually randomly distributed. They have the same organizational structure, little difference in network status, no specifically defined functions, and are often misused. The nodes are powered by batteries, and cannot be replenished and replaced manually after the power is exhausted. Energy constraints are the most difficult problem in wireless sensor networks. In order to prolong the lifetime of the network, the energy consumption of operating nodes must be reduced. It need to reduce the effective transmission distance of the nodes, reduce the coverage area of each node, and use the method of multihop relay to transmit data. At present, the solution of wireless sensor network lies in designing the topology structure and routing protocol. The LEACH protocol is a routing protocol in the wireless sensor network protocol that uses the clustering method to achieve energy balance. The LEACH protocol uses a voting procedure to select cluster heads in the cluster head selection phase. Each round is divided into two phases. In the installation phase, the cluster nodes are randomly generated, and the energy consumption is low. In the stable phase, the cluster head collects data and sends it to the absorbing node, which consumes a lot of energy. Under the traditional tree topology, it is an extension, a branch under the bus topology. For example, in a complete tree, the root is down and the trunk is up, while the tree topology is the opposite, the root is down and the trunk is up. There are many nodes in the tree topology, and these nodes do not have many paths to the previous summary point; instead, they are all unique. Therefore, the failure of one of the nodes will affect the transmission of the entire network. The topology is shown in Figure 4.

Existing protocols, such as the SAR routing protocol, include multipath routing protocols that guarantee QoS. It also creates a tree topology with adjacent zinc nodes as the root. Once the tree topology is established, there are more adjacent nodes around the zinc node than all root nodes in the tree topology. The adjacent nodes in the multipath sink node formed in this way are truncated, which effectively reduces the problem that the energy consumption of the adjacent nodes of the sink node is too fast. However, when the number of nodes in the SAR protocol is large, nodes need a lot of redundant routing information to establish routes. There is a significant overhead in maintaining the routing table and the state table of each node. Aiming at the problems of unbalanced energy distribution and unreasonable energy consumption in traditional wireless sensor network topology management algorithms and routing, a wireless sensor network clustering method and intracluster topology control algorithm based on backup nodes are proposed. It can be achieved by controlling the number of node hops, inferring cluster regions, and setting priorities. To classify multiple nodes in a wireless sensor network, the nodes must first be divided into multiple clusters. Each

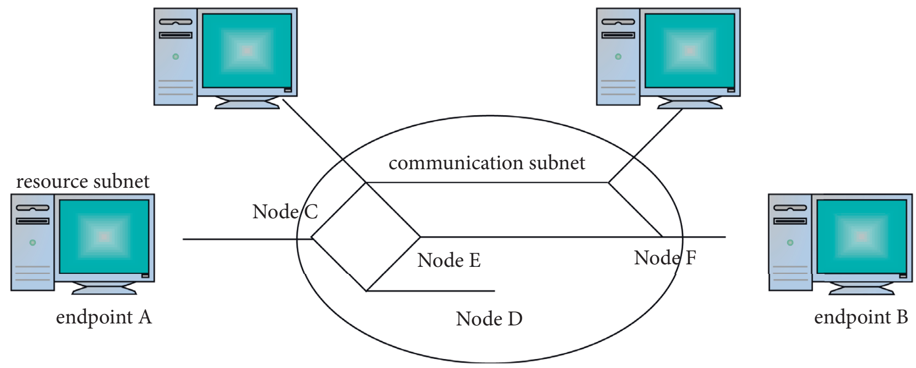


Figure 4: Schematic diagram of topology.

cluster has a cluster head, and nodes reside in multiple clusters. Each cluster is independent, and the cluster nodes send data to the endpoints of the cluster through multiple hops, and the endpoints of the cluster participate in and process the data. Data are forwarded between clusters through multiple cluster heads and finally reaches the sink node. Figure 5 is a schematic diagram of the realization process of this study.

The wireless sensor network considered in this topic contains several independent clusters. Each cluster has a cluster head and several nodes within the cluster. The cluster head is responsible for aggregating and processing the data from the nodes. In order to preserve the remaining energy and operational status of the cluster head, a second cluster head must be selected to assist the operational cluster head in sending data to the sink node and to share communication energy between the operational cluster head and the sink node to extend the time of the operational cluster head. The working cluster head uses the node with the highest residual energy in the inner ring as a backup cluster head. When the working cluster head processes information from this cluster node, it passes it on to the backup cluster head. The standby cluster head not only forwards the data of the node in the cluster but also acts as a relay node to forward the data of the nodes in the outer cluster. In the process of the backup cluster head forwarding data to the sink node, monitor the energy consumed by each backup cluster head to send information and use the energy consumption value as the weight. Using the shortest path algorithm, the sink node is used as the source node to find the next node with the smallest weight in turn. Finally, the optimal path of energy consumption balance is obtained, and the optimal path of the cluster head between the standby cluster head A and the standby cluster head G is obtained by using the shortest path algorithm. The process of finding the optimal path is shown in Table 1. ∞ means unreachable, and ∽ means there is a shortest path. First, A is used as the source node, and the energy consumption values of reaching B and C are 7 and 15, respectively, and the other nodes are unreachable, then select the energy.

The CANCORR process of SAS9.0 statistical analysis software was used for canonical correlation analysis, and the results are shown in Table 2.

It can be seen from Table 2 that the first three canonical correlation coefficients are relatively high. It shows that there is a high correlation between "variable group of technology transfer" and "variable group of realizing independent innovation." In addition, it can be seen from the mathematical statistical test of the typical variables that only the first pair of typical variables passed the test, which has economic interpretation significance. The test results are shown in Table 3.

For the calculation steps of the above-mentioned gray correlation degree, the current theoretical circle has not given a definition of the level of industry-university-research cooperation and the technology stock of the enterprise under the optimal scale state. Therefore, this paper uses the sample average as the standard value to do nonquantization processing on the table, then obtains the corresponding difference list, and then obtains the correlation coefficient. As shown in Figures 6 and 7.

2.1.4. Typical Correlation Model of Industrial Transfer. Relevant requirements: Canonical correlation analysis can accommodate any metric variable without strict normality assumptions, that is, allow the use of nonmetric variables. However, normality of each univariate needs to be guaranteed. Although not strictly, normality is required, and it is necessary to transform the variables. In addition, in order to avoid "overfitting" of the data, the number of observations for each variable is generally more than 10:

$$\begin{aligned} \operatorname{cov}\begin{bmatrix} x \\ y \end{bmatrix} &= \sum = \begin{pmatrix} \Sigma_{11} & \Sigma_{12} \\ \Sigma_{21} & \Sigma_{12} \end{pmatrix}, \\ V &= a' X = a_1 x_1 + a_2 x_2 + \cdots + a_p x_p, \\ W &= b' Y = b_1 y_1 + b_2 y_2 + \cdots + b_q y_q, \\ r &= \frac{\operatorname{cov}(V, W)}{\sqrt{\operatorname{var}(V)\operatorname{var}(W)}}. \end{aligned} \tag{1}$$

When the maximum is reached, the standardized random variables V and W can be given as

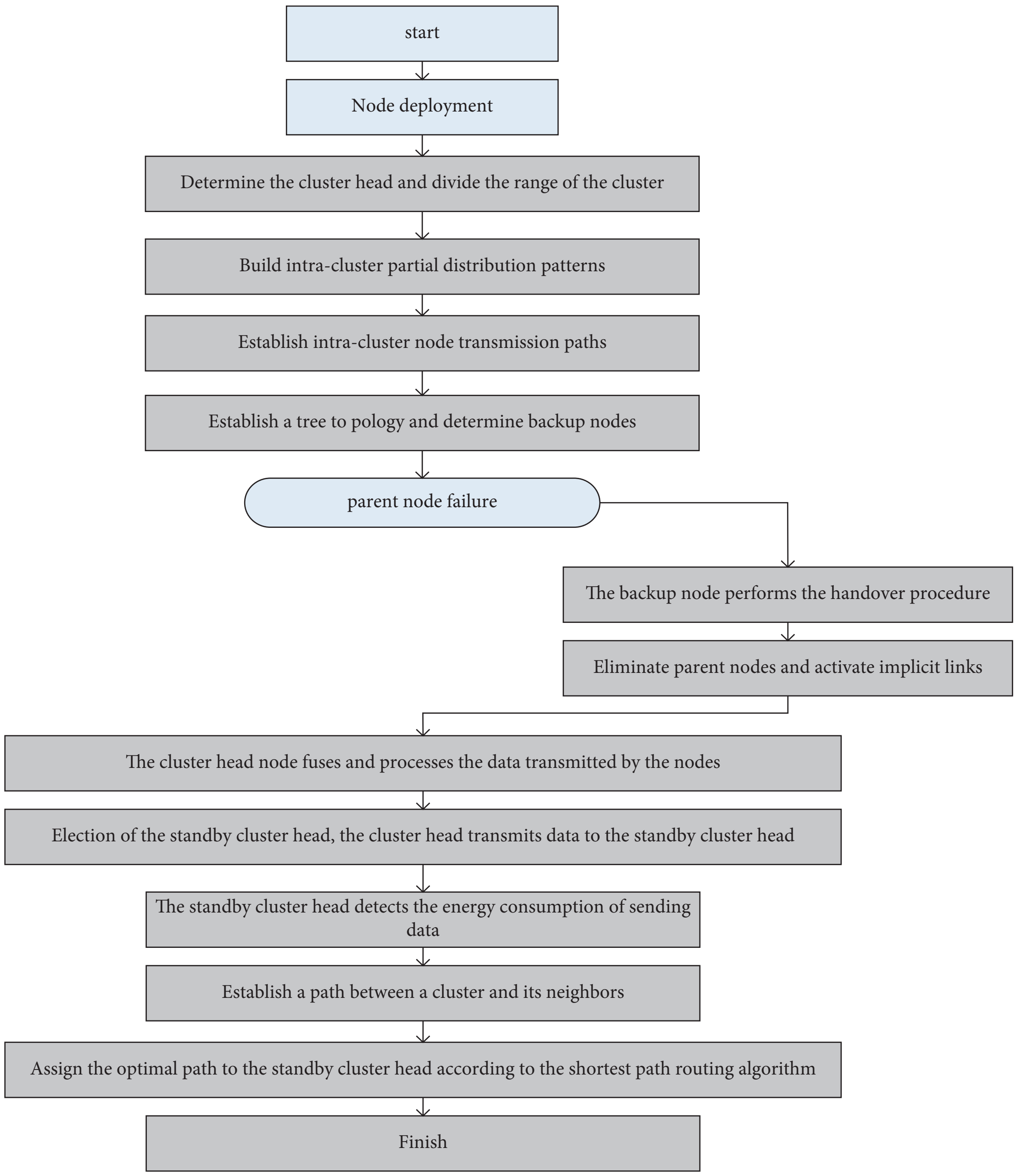


Figure 5: Schematic diagram of the project realization process.

Table 1: The process of finding the optimal path for the backup cluster head.

A	Direct	<*A*, *B*>	<*A*, *B*, *E*>	<*A*, *B*, *E*, *D*>	<*A*, *B*, *E*, *D*, *C*>	<*A*, *B*, *E*, *D*, *C*, *F*>
B	7	∽	∽	∽	∽	∽
C	15	15	15	15	∽	∽
D	∞	16	14	∽	∽	∽
E	∞	12	∽	∽	∽	∽
F	∞	∞	18	18	18	∽
G	∞	∞	25	22	22	22

Table 2: Canonical correlation coefficient analysis.

Canonical correlation coefficient	Approximate standard error	Eigen values	The proportion	Cumulative ratio
0.996897	0.001719	160.3726	0.9287	0.9287
0.946791	0.028730	8.6537	0.0501	0.9788
0.842772	0.080358	2.4514	0.0142	0.9930
0.680894	0.148766	0.8643	0.0050	0.9980
0.502339	0.207362	0.3375	0.0020	1.000

Table 3: F test statistical comparison table.

Likelihood ratio	Approximate F value	Num DF	Den DF	Pr > F
0.00007459	4.55	30	14	0.0021
0.01203599	1.98	20	14.216	0.0950
0.11619241	1.42	12	13.52	0.2680
0.40102941	1.16	6	12	0.3886
0.74765530	1.18	2	7	0.3614

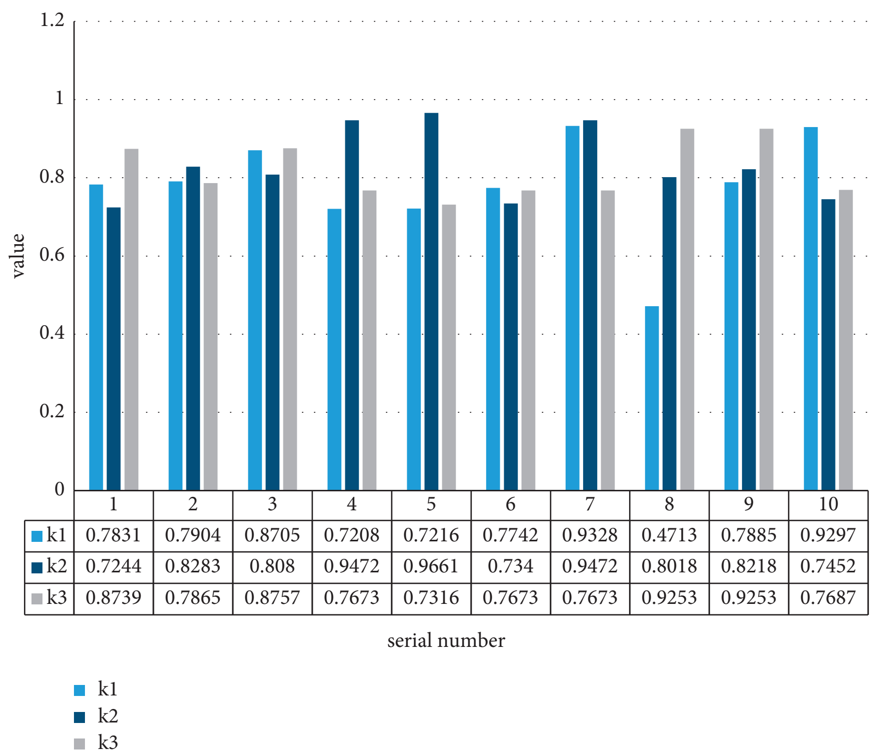


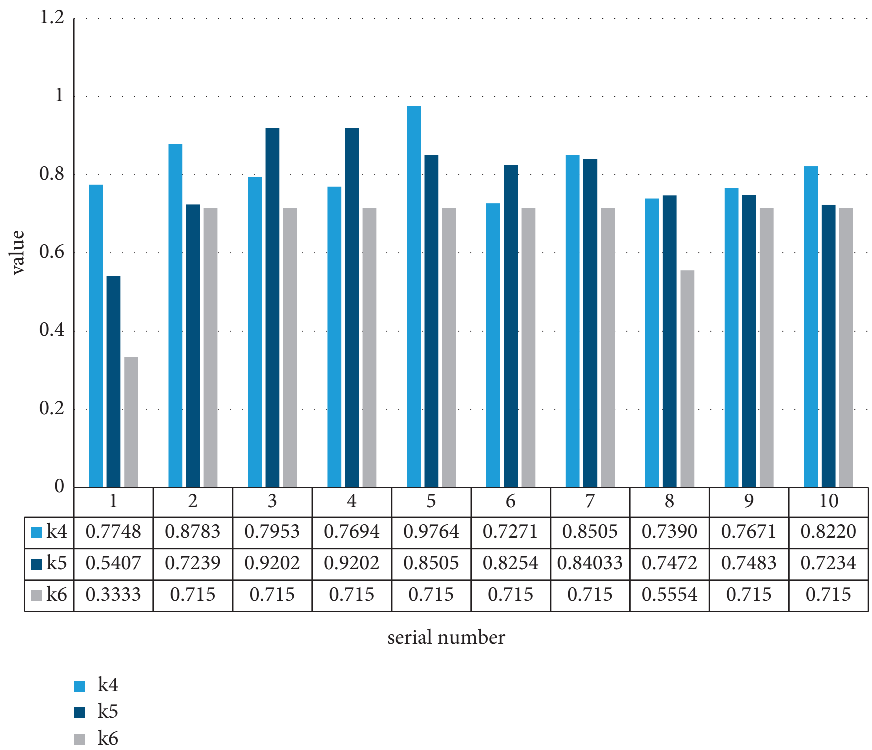
Figure 6: Correlation coefficients of factors affecting technology transfer.

$$\begin{aligned}
\operatorname{var}(V) &= \operatorname{var}(a'x) = a'\sum_{11} a = 1,\\
\operatorname{var}(W) &= \operatorname{var}(b'y) = b'\sum_{12} b = 1,\\
r &= \operatorname{cov}(V, W) = a'\operatorname{cov}(x, y)b = a'\sum_{12} b,\\
G &= a'\sum_{12} b - \frac{\lambda}{2}\left(a'\sum_{11} a - 1\right) - \frac{u}{2}\left(b'\sum_{22} b - 1\right).
\end{aligned} \tag{2}$$

It finds the first-order partial derivative of G, sets it to 0, and obtains a system of equations:

$$\begin{aligned}
\frac{\partial G}{\partial a} &= \sum_{12} b - \lambda \sum_{11} a = 0,\\
\frac{\partial G}{\partial b} &= \sum_{21} a - \mu \sum_{22} b = 0,\\
a'\sum_{12} b &= \lambda a'\sum_{11} a = \lambda,\\
b'\sum_{21} a &= \mu b'\sum_{22} b = \mu.
\end{aligned} \tag{3}$$

The sample canonical correlation analysis is used in this paper. By mathematical proof, it is the maximum likelihood estimate of the population. Its basic principle and calculation



	1	2	3	4	5	6	7	8	9	10
k4	0.7748	0.8783	0.7953	0.7694	0.9764	0.7271	0.8505	0.7390	0.7671	0.8220
k5	0.5407	0.7239	0.9202	0.9202	0.8505	0.8254	0.84033	0.7472	0.7483	0.7234
k6	0.3333	0.715	0.715	0.715	0.715	0.715	0.715	0.5554	0.715	0.715

Figure 7: Correlation coefficient.

process are consistent with the overall canonical correlation analysis:

$$\begin{aligned} \mu = b\prime \sum_{21} a &= \left(a\prime \sum_{12} b \right)\prime = \lambda, \\ \sum_{12} b - \lambda \sum_{11} a &= 0, \\ \sum_{21} a - \lambda \sum_{22} b &= 0. \end{aligned} \tag{4}$$

Given the original data column, the m comparison columns can be given as

$$\begin{aligned} X_1(k) &= \{X_1(1), X_1(2), \ldots, X_1(n)\}, \\ X_2(k) &= \{X_2(1), X_2(2), \ldots, X_2(n)\}, \\ X_m(k) &= \{X_m(1), X_m(2), \ldots, X_m(n)\}. \end{aligned} \tag{5}$$

Finding the corresponding difference between the reference sequence and the comparison sequence, we get

$$\begin{aligned} \Delta_{01} &= |y_0(k) - y_1(k)| = \{\Delta_1^{(1)} \Delta_1^{(2)} \ldots \Delta_1^{(n)}\}, \\ \Delta_{02} &= |y_0(k) - y_2(k)| = \{\Delta_2^{(1)} \Delta_2^{(2)} \ldots \Delta_2^{(n)}\}, \\ \Delta_{0m} &= |y_0(k) - y_m(k)| = \{\Delta_m^{(1)} \Delta_m^{(2)} \ldots \Delta_m^{(n)}\}. \end{aligned} \tag{6}$$

2.2. Current Situation and Influencing Factors of Technology Transfer and Independent Innovation

2.2.1. Influencing Factors of Technology Transfer and Independent Innovation. At present, the research literature on the factors affecting the development of technology industry transfer is mainly based on qualitative analysis. As an innovative activity, technology industry transfer mainly involves scientific research institutes, enterprises, venture capital institutions, and so on. Therefore, there are many factors that affect the development of technology transfer, such as market demand, enterprise system, industrial orientation, technology system, economic system, macroeconomics, legal environment, technology development level, high-tech industrialization environment, benefit distribution, financing environment, government procurement, venture capital, intellectual property protection, tax reduction and exemption policies, high-quality human resources, R&D funding, and cultural characteristics and educational background. There are two main factors: one is direct factors, such as the level of scientific and technological development, market demand, industrial policy orientation, R&D investment, and venture capital. These direct factors that affect the development of technology industry transfer also affect and restrict technology transfer The key factors largely depend on the status of these factors. The second is indirect factors, such as enterprise system, scientific and technological system, benefit distribution, intellectual property protection, national tax reduction policy, technology transfer environment, and cultural characteristics and educational background. These factors are the signs of whether technology transfer can develop smoothly. This system uses the data acquisition and monitoring system to propose a wireless sensor network clustering method in the aspect of wireless sensor network data transmission. A new method is proposed for the application of data acquisition and monitoring system. This method is based on the cluster topology control algorithm of backup nodes. In order to promote the smoothness of the connection between complex networks instead of being messy, in a word, it is evenly connected, and at the same time, it can also provide a convenient multihop path for communication between different users; the role of this new idea prevents a node from losing its function and affecting the overall situation, including energy consumption and physical damage or moving position; therefore, the topology control algorithm in this paper does its best to reduce energy consumption, thereby ensuring the connectivity of the entire network.

2.2.2. Methods and Technical Routes. Data-based network monitoring technology mainly adopts the method of collecting network data packets and analyzing them. This method is mainly used for postevent analysis of network events and has a good effect on locating network events and network faults. The number of data packets is large, the software and hardware requirements of the analysis tool are relatively high, and the real-time response to the state of the equipment cannot work well. Theoretical analysis method: The success of any research is inseparable from the support of theoretical foundations. Regional technology transfer involves the theoretical system of regional technology flow. The theoretical system of regional technology flow is also a strong theoretical basis for the transfer of technology between regions. Literature research method: It is necessary to master the research content of scholars in related fields and understand the methods used by scholars in related fields. It finds out the deficiencies of scholars in related fields, supplements and innovates the deficiencies of previous studies with its own methods, and improves the analysis in related fields. Therefore, the literature research method is indispensable. Statistical analysis method: Select a database to conduct statistics on relevant data and analyze the status quo of regional technology transfer. Spatial metrology: Use the relevant knowledge of spatial metrology to analyze the spatial distribution and correlation of regional technology transfer so as to grasp its distribution law and lay the groundwork for subsequent research. Empirical analysis method: Empirical analysis of panel data were carried out using Eviews6.0 software. It is hoped to obtain the influence degree of the influencing factors of regional technology transfer and then provide a useful reference for balancing regional economic development. On the basis of the general framework of raising questions, analyzing problems, and solving problems, the article first summarizes the current situation and deficiencies of previous research according to the background of the topic selection and research review of the article and then puts forward the core issues of the article, that is, to explore the spatial correlation and influencing factors of regional technology transfer. Second, based on the questions raised, ArcGIS software and GeoDa software are used to analyze the spatial distribution characteristics of regional technology transfer, and the empirical analysis method is used to analyze the influencing factors of technology transfer. Finally, on the basis of the previous research, put forward corresponding suggestions and countermeasures and then solve the problem, as shown in Figure 8.

As can be seen from Figure 9, the turnover of technology contracts in China is on the rise. And in 2014, the turnover of technology contracts exceeded 800 billion yuan for the first time, reaching 857.718 billion yuan, causing an increase of 14.84% over the previous year. The turnover of technology contracts increased from 108.467 billion yuan in 2003 to 857.7 billion yuan in 2014, which is an increase of nearly eight times during this period. In order to better understand the development of the domestic technology trading market, let us take a look at the growth of national technology trading contracts relative to the national GDP. Table 4 shows the comparison between the technology contract turnover and the national per capita GDP from 2003 to 2014.

As can be seen from Table 4, although the proportion of the national technology contract turnover in the national GDP decreased slightly from 2003 to 2014, the proportion of the two showed an upward trend in general. Especially after 2010, the proportion of the national technology contract turnover in the national GDP increased rapidly. As of 2014, the ratio of the two reached 1.35 percentage points. In 2003, the turnover of technology contracts accounted for 0.93% of China's GDP, while in 2014, the turnover of technology contracts accounted for 1.35% of China's GDP, which is an increase of 0.42% and an increase of 0.04% from 2003 to 2014. It can be seen that China's technology trading market is growing rapidly, and technology transfer activities are becoming more and more active. We have shown below the top ten provinces in terms of technical contract value, as shown in Figure 10 and Table 5.

Generally speaking, the evaluation of technical level often involves two aspects; that is, the evaluation of the technical level of each region in the country and the comparison of the technical level among the countries. The party exporting technology and the party importing technology often also consider the performance of technology export or import. At this time, it will be investigated whether the technical output and introduction can meet the corresponding sales volume or market expansion needs. These are reflected in the evaluation of technology transfer to a particular country. However, due to the availability of data, this paper only considers the output capacity and effectiveness of technology recipients using technological innovation. From the level of national technology development, the effect of technology transfer is mainly reflected in the research of new products and the progress of high-tech industries. This paper selects the ratio of new product development expenditure to main business income of industrial enterprises above designated size in each region, the ratio of new product sales revenue to main business income, and the ratio of new product export to main business income to measure the effect of regional technology transfer.

2.2.3. Status Quo of Independent Innovation Capability. In recent years, China has implemented an innovation-driven development strategy and continuously increased investment in innovation. It actively promotes scientific and

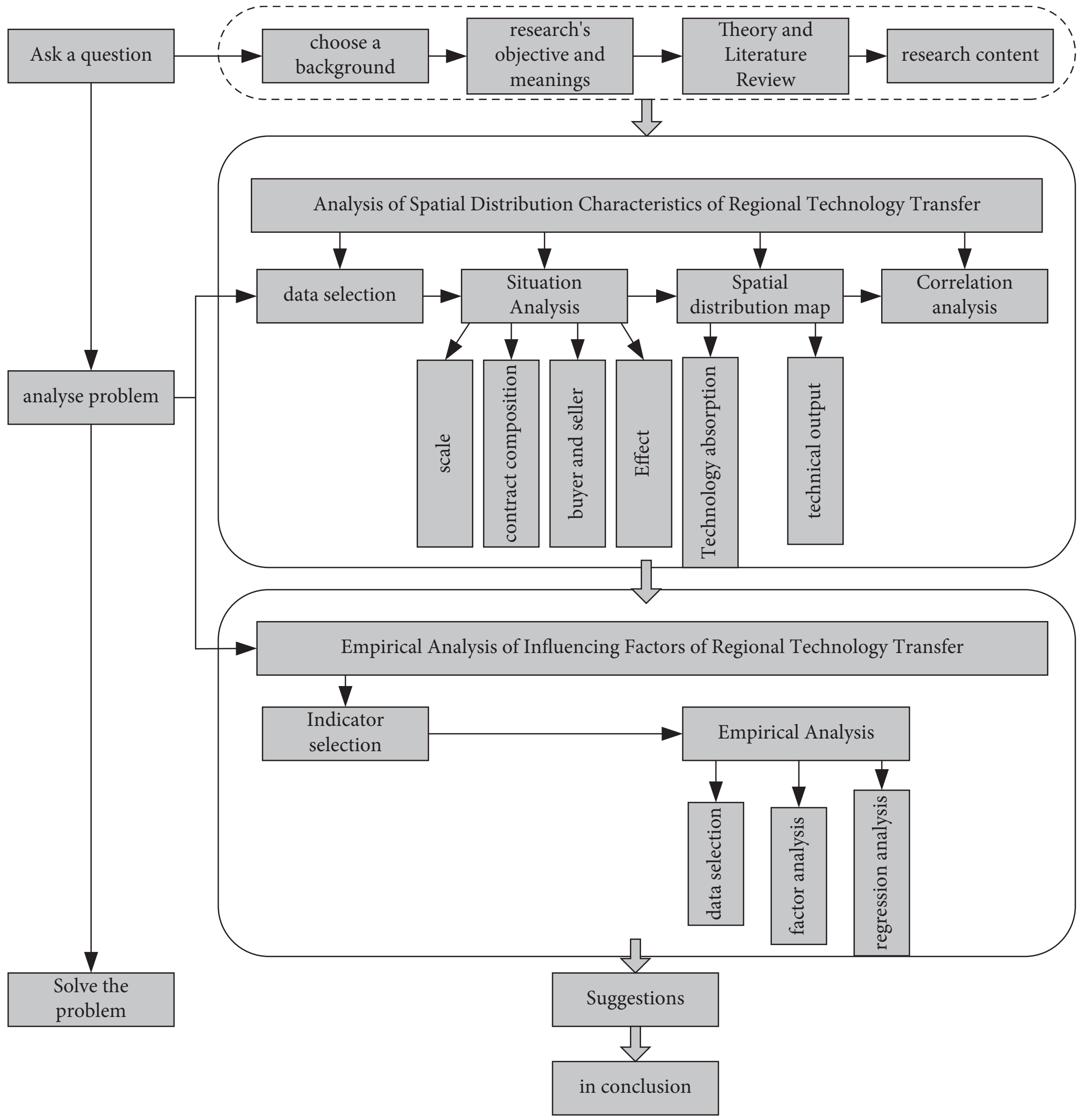


Figure 8: The technical roadmap of the article.

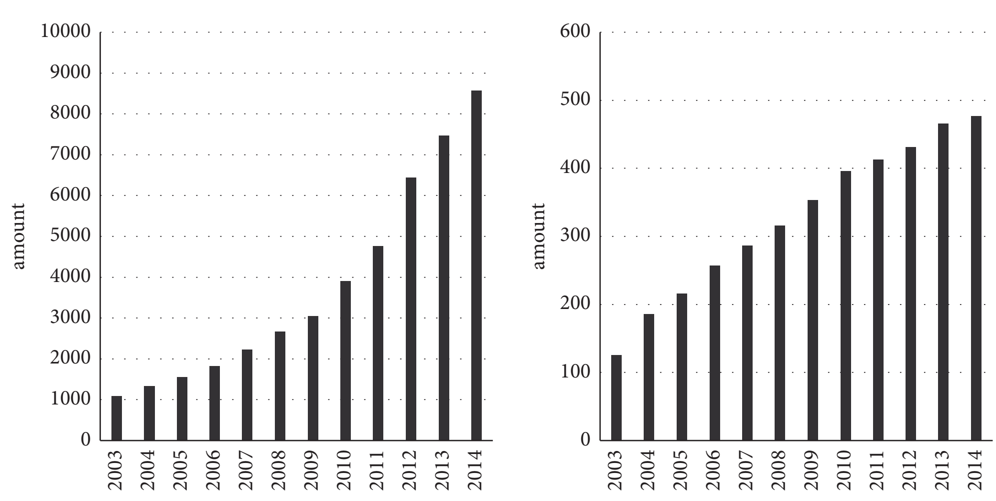


Figure 9: China technology contract turnover.

Table 4: Comparison of technology contract turnover and GDP.

Year	Gross domestic product	Technical contract turnover	Technical contract turnover
2003	135822.76	1084.67	0.93
2004	159878.34	1334.36	0.98
2005	184937.37	1551.36	0.85
2006	216314.43	1818.18	0.87
2007	265810.31	2226.53	0.9
2008	314045.43	2665.23	0.89
2009	340902.81	3039.01	0.89
2010	401512.8	3906.58	0.97
2011	473104.05	4763.56	1.01
2012	519470.1	6437.07	1.24
2013	568845.21	7469.13	1.34
2014	636462.7	8577.18	1.35

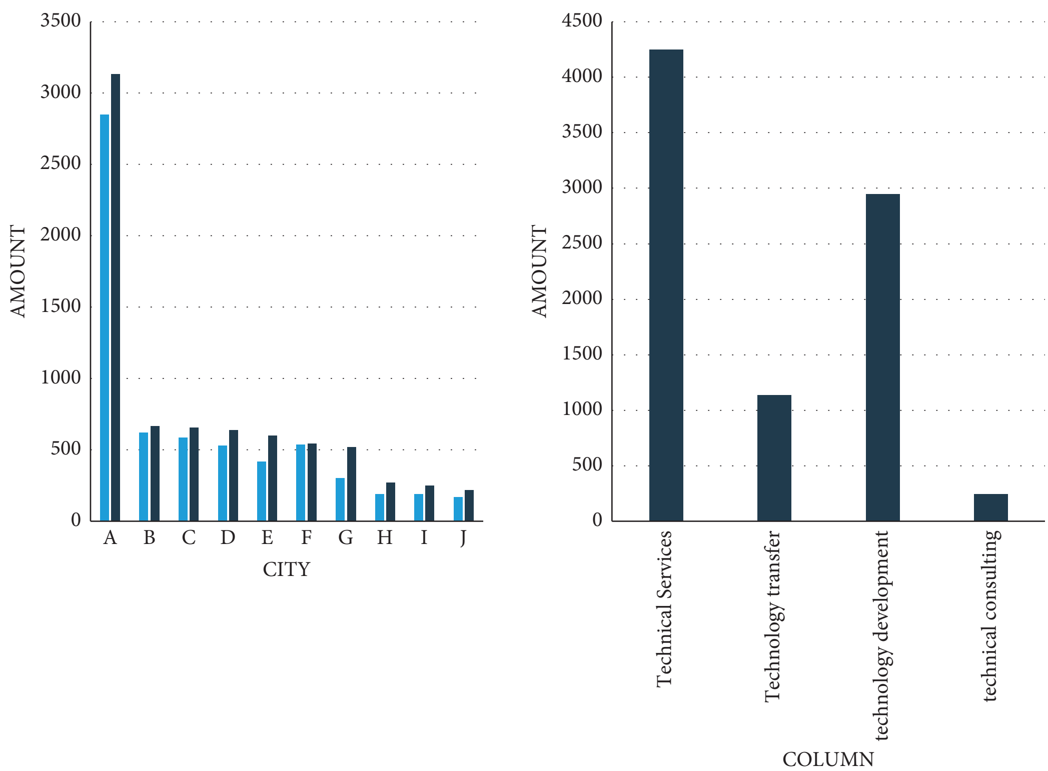


Figure 10: Top ten registered technology contracts in all provinces and cities in 2014.

technological innovation and technological progress and greatly enhances the ability to transform scientific and technological achievements. It can be seen from Figure 11 that during the period from 2004 to 2015, China's R&D investment continued to increase year by year. R&D expenditures rose from 196.633 billion yuan in 2004 to 1,416.99 billion yuan in 2015. With the increase in R&D investment, the full-time equivalent growth of R&D personnel has steadily increased, reaching 3.7588 million per year in 2015. Figure 11 shows the top nine countries in terms of R&D investment intensity from 2004 to 2015. China's input intensity has been expanding from 1.23% in 2004 to 2.08% in 2015. However, compared with other developed countries, there is still a big gap, and R&D investment needs to be further strengthened. Japan has been ranked first in the past eleven years, and its investment intensity reached 4.39% in 2015, followed by Germany, the United States, and France. China ranks fifth, which shows that there is still a long way to go to catch up with Japan, Germany, the United States, and other countries in terms of research and development capabilities.

Patents are the embodiment of a country's ability to innovate independently. In particular, technical patents play an important guiding role in the innovation of the industry. In terms of innovation output, the number of patent applications accepted in China increased from 353,800 in 2004 to 2,798,500 in 2015, an almost eightfold increase. Patents are divided into three types: invention patents, utility models, and designs. It can be seen that the acceptance of these three kinds of patents is in a growing state. The

Table 5: National technology contract recognition and registration in 2014 (unit: 100 million yuan).

Area	Turnover	Ranking
City A	3136	1
City B	667.82	2
City C	655.24	3
City D	639.98	4
City E	601.74	5
City F	543.14	6
City G	418.11	7
City H	269.03	8
City I	250.89	9
City J	221.32	10
City K	175.35	11
City L	169.83	12
City M	121.21	13
City N	115.23	14
City O	97.93	15
City P	89.16	16
City Q	50.83	17
City R	50.76	18
City S	48.73	19
City T	48.51	20
City U	41.64	21
City V	35.43	22
City W	32.54	23
City X	29.87	24
City Y	28.23	25
City Z	20.04	26

proportion of invention patents showed a certain downward trend from 2009 to 2012. The proportion of utility model patents accepted continued to grow. The proportion of design patents accepted has shown a downward trend. It can be concluded that China's emphasis on invention patents and utility model patents in patent acceptance has increased year by year.

3. Results

Anselin proposes to use the most common probability estimation methods to estimate the parameters of the spatial model. This can explain the scientific nature of the spatial superposition effect of dependent variables and overcome biased and unequal results. It induces changes in the smallest squares using ordinary methods. At the same time, after the Hausman test, it can be seen that the fixed effect model should be selected. Because each region has individual characteristics, the regression results will be affected to a certain extent, so the choice is more reasonable. Whether the spatial panel model adopts the spatial delay model or the spatial error model, according to the Anselin criterion, the larger the adjusted goodness of fit R^2, the larger the Log-L, the smaller the AIC, and the better the effect. This paper selected different spatial econometric models for specific analysis at different levels of analysis. The system is divided into two parts: the processing of small-scale data resources, such as temperature, wind speed, light, and so on. When processing these data, Zigbee protocol is used, and based on this protocol, the ad hoc network capability has wireless sensor network. On the contrary, when dealing with larger data, use wireless network to collect and monitor. This method has advantages unmatched by other methods, such as low cost, high performance, high real-time performance, and other characteristics, and the application prospect is very broad.

From the perspective of data collection and monitoring system, the transfer of China's manufacturing industry has a significant role in promoting regional independent innovation capabilities, and the spatial spillover effect of regional independent innovation capability is also significantly positive. It shows that the transformation of China's manufacturing industry can not only improve the independent innovation ability of the region but also improve the independent innovation ability of neighboring regions and regions with similar economic characteristics. From a regional perspective, the impact of regional manufacturing transformation on changes in regional autonomy varies greatly. The comparison and analysis of regression results for the eastern, central, and western samples show that the industrial transformation of the central region does not significantly affect the regional capacity for change. The impact of development in the eastern region is greater than in the western region. At the same time, the eastern and western regions are also higher than the central region in terms of the impact of spatial overpopulation. This result may be due to the high openness of the eastern region which makes it favored by international industrial transfer. Through imitation, competition, and innovation, the transfer to foreign advanced manufacturing and high-tech industries is stronger. Through the flow of human capital and the ability of independent innovation, the eastern region will transfer mature industries to the central and western regions. To make room for high-end industries that undertake the international industrial chain, the eastern region will increase its independent innovation efforts. The impact of industrial transfer in the central region on the capability of independent innovation did not pass the significant test. It may be because the region has not yet formed a perfect system combining economy and technology, and there are certain obstacles in the seamless connection of production, education, and research. In order to attract higher-quality investment, the western region has increased the construction of knowledge-based infrastructure such as R&D platforms and innovation networks. It realizes that if it wants to fundamentally enhance the rooting and stability of undertaking industrial transfer, only through independent innovation, it can continuously enhance the ability of regional independent innovation and create an irreplaceable industrial environment. Therefore, various measures have been actively formulated to encourage enterprises to intensify their innovation efforts.

Strengthening regional technological capabilities is conducive to the smooth development of regional technology transfer. The difference in technical ability between regions is too large, and the technology introduced by the region with lower technical ability may not be in line with its own economic development, and the real effect of the introduced technology cannot be exerted. Regional technical

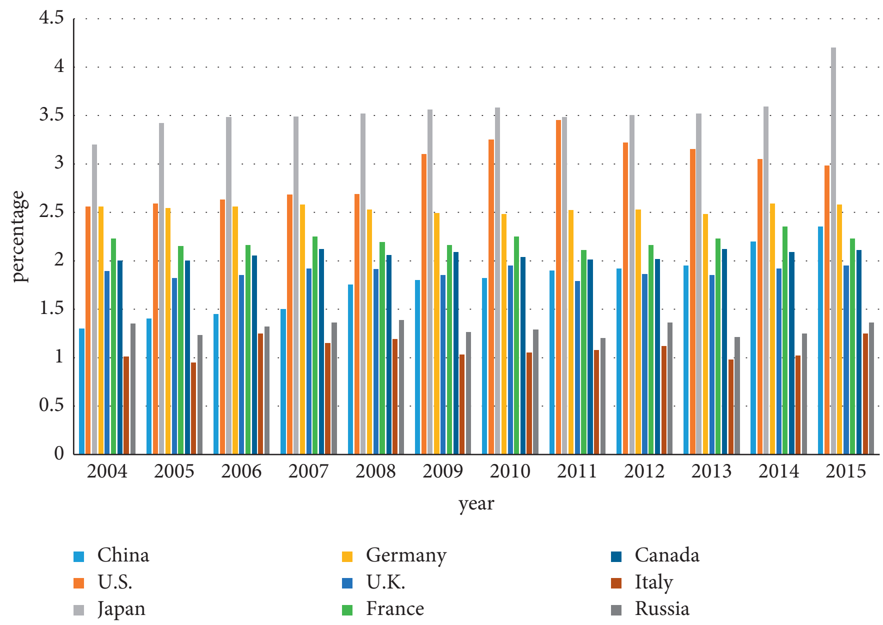


Figure 11: International comparison of R&D investment intensity from 2004 to 2015.

capabilities are reflected in enterprises, universities, and scientific research institutions, but the key is enterprises. The enhancement of enterprise technical capability is the premise and guarantee for the smooth progress of technology transfer between regions. Enterprises can start from three aspects in their efforts to improve their technical capabilities: First, knowledge is the foundation. Enterprises should formulate and establish a knowledge training mechanism according to their own development strategies to enhance their knowledge base. Second, technical talents are the key. Corresponding incentive measures should be formulated to stimulate the enthusiasm of employees to learn and cultivate technical talents. Again, hardware facilities are the foundation. Without equipment, there would be no transformation of technological achievements. Therefore, enterprises should strengthen the construction of hardware facilities. Finally, the environment is the guarantee. A good corporate working environment allows employees to work wholeheartedly and exchange knowledge. Therefore, enterprises should ensure the working environment of employees. The regional technology absorptive capacity is mainly reflected in the basic quality of personnel, the basic input of human and financial resources, and the status of transformation and utilization of technological achievements. However, some enterprises in the region, especially small and medium-sized enterprises, are developing relatively rapidly and have an urgent need for emerging technologies. However, its sources of information are relatively narrow, and the cost support is relatively weak. However, the large state-owned enterprises in the region have insufficient innovation ability, and the quality of scientific research personnel is not high. The introduced emerging technologies are directly sent to the production line without being digested and absorbed, so the scientific research ability is relatively weak. Regions, especially underdeveloped regions, should focus on basic research rather than transient regional development. It should increase the capital investment in scientific and technological research, improve the quality of scientific research personnel, and strengthen the ability of regional technology to digest and absorb new technologies, so as to improve the regional absorptive capacity quickly, thereby narrowing the gap of regional economic development.

4. Conclusions

In order to ensure the security of data retrieval and system monitoring, the real-time data retrieval system architecture, data retrieval scheme, and data security transmission solution are planned. A set of database-based real-time data retrieval system is constructed by using data acquisition port and port isolation. It solves the problem of data acquisition and realizes real-time data acquisition, storage and management, as well as various data communication interfaces and data security transmission management systems etc. and improves the efficiency and information management level. The system has achieved good results after the actual operation. The experimental results show that in the process of technology transfer, external factors undoubtedly have different degrees of influence on the transfer effect. From the main perspective, the transformation of the manufacturing industry has played an important role in improving the transformation capacity of independent regions and the spatial overshoot of the transformation capacity of independent regions. This is also positive, indicating that the transformation of manufacturing alone will greatly enhance the ability of independent innovation research and transform regional autonomy. Through the influence of spatial superposition, the autonomous ability of the renovated area and the surrounding areas with similar economic and social characteristics will be enhanced. The analysis of technology transfer and independent innovation through data acquisition and monitoring system technology plays a key role.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares no conflicts of interest.

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