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Public Management Construction of Ice and Snow Sports Tourism Industrial Cluster Based on Big Data Security and Artificial Intelligence

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Abstract: Facing the increasingly fierce market competition and the impact of the global financial crisis, the development of the ice and snow sports tourism industry is facing major challenges. The reconstruction of the tourism industry has become an urgent problem in the field of tourism research. In order to explore how to apply data security technology and artificial intelligence technology to the system construction and ice and snow tourism industry, this article uses data collection methods, data aggregation methods, and parameter comparison methods to conduct large-scale scientific analysis of data security technologies and create a most effective industrial cluster platform. First study the role of big data security technology. During the 600 rounds of data-free simulation on the trading platform, two different evaluation methods were used to distinguish the trading results of the same data trading event. The results show that among 600 rounds of transaction events and rating results, 530 ratings are the same, 70 have similarities and differences, and the effective rate is 88.3%, indicating that the security technology in this area is effective and can support the transmission of information on the network platform. After the training of the intelligent algorithm, we can see that the detection efficiency of the algorithm on this platform has increased from 0.114 to 0.241, and the detection time has also been reduced from 33ms to less than 2.1ms, which shows that more and faster resources in the industry can be searched. Starting from the technical understanding of big data security and artificial intelligence, it ends with the construction of a good-performance industrial cluster model.

1. Introduction

With the rapid development of information technology and mobile internet, the significance of big data technology has gained increasing attention across various industries, including tourism. Big data helps analyze customer behavior for targeted business strategies. In addition, the growth of

artificial intelligence (AI) is expected to impact the tourism industry, including the ice and snow tourism sector.

Research on the ice and snow tourism industry is increasingly focusing on big data security and AI. Puthal D (2017) proposed a long-term security protocol (DLSeF) to address real-time, high-speed data streaming security challenges, though experimental data is limited [1]. Bharathi S V (2017) identified key data security risks, including new technologies and lack of secure systems, but the investigation lacked depth [2]. Blobel B (2016) reviewed security and privacy issues in big data, especially in health, emphasizing the need for appropriate tools to empower patients, though there were differences in research approaches [3]. Jeavons (2017) discussed AI-based intelligent programs for problem-solving but noted practical limitations of current technologies [4]. Hassabis D (2017) explored the relationship between AI and neuroscience, highlighting potential future research directions, but the pros and cons of such research are evident [5]. Rui (2017) developed nanocomposite solutions for high-altitude conditions but cautioned against direct applications to icebergs [6]. Gw A (2018) reviewed polar road design using ice and snow, emphasizing the need for predictive models, though the research has not yet been published [7].

The innovations of this paper include: (1) Classify and analyze the related concepts of existing business complexes, and clarify the definition of business architecture; (2) In terms of technology application, compared with the existing industrial architecture, the artificial intelligence technology Development is based on the standard analysis of artificial intelligence behavior, and is tested through the combination of two technologies; (3) The cluster process of tourism industry upgrading and optimization, including the upgrading of power equipment, transmission and development methods, and efficient optimization of communication systems. Through the above work, the content of this paper is enriched and the results of this paper are more suitable for practical applications.

2. Implementation Methods of Research on the Construction of Industrial Clusters Based on Big Data Security and Artificial Intelligence

2.1 Big Data Security

Big data is like a scientific double-edged sword. Big data technologies, such as collection, processing, and analysis, can generate unexpected benefits from seemingly large amounts of garbage and garbage data, such as the acquisition of new knowledge, mismatches in business practices, future risk predictions, and analysis to determine the authenticity of information. Wait [8]. However, while big data brings unlimited value to society, it also brings major security risks. Personal information and privacy appear in every corner of the Internet more and more unreservedly, and privacy issues cannot be ignored [9]. Let's summarize the main security issues brought about by big data, as shown in Table 1:

Table 1: Major security issues brought about by big data

Issues	Specific description	Parameter expression(bytes)	Accuracy
Personal privacy protection	Anonymity protection, etc.	11	99.5%
Control access	Management and usage rights	34	94.4%
The credibility of big data	Underlying essential information	12	93.1%
Sustainable target	Involved in a wide range	21	96.8%

As suggested by the NIST big data drive system, the big data traffic system is the highest among traditional data systems. This is a retail and independent technical program. Eventually it can be applied to a large number of different business models [10]. Figure 1 shows the reference architecture.

As can be seen from Figure 1, it includes data mining services, data analysis, data verification and data manipulation. Data client services including application service availability, data description, data display data presentation, etc. Big data application services include identity management and authentication. Project managers are used to identify requirements, manage and execute project ideas [11-12].

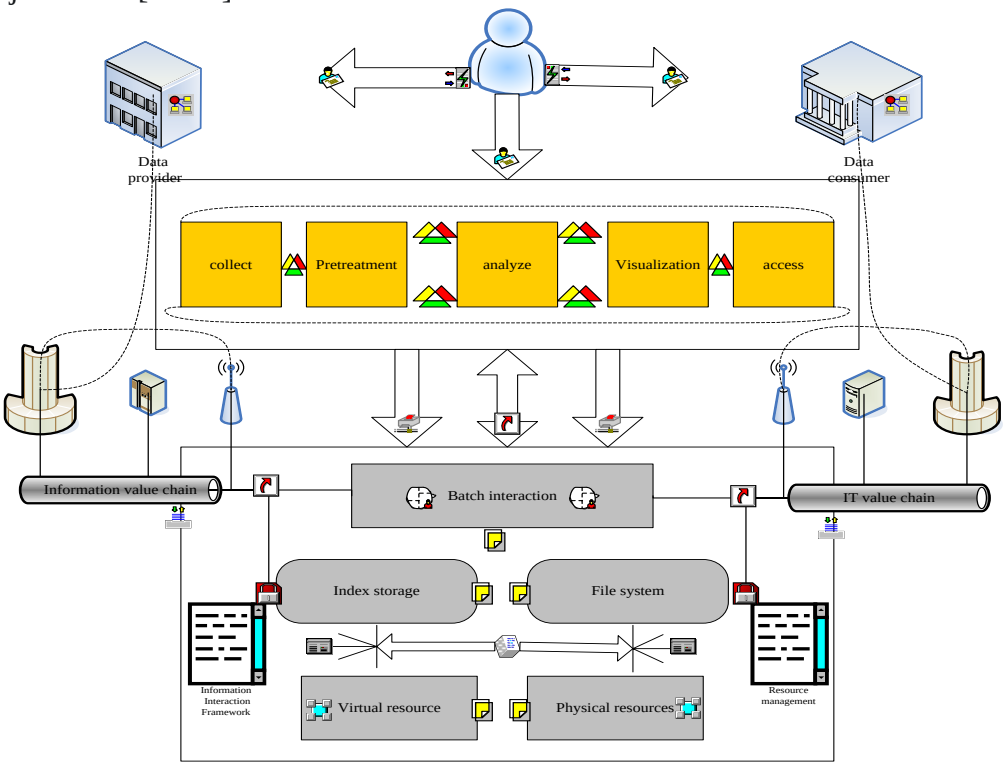

Figure 1: Big data technology reference architecture

In this paper, the idea of independence weight coefficient is used as the weight judgment rule for each of the three dimensions of big data security rating [13]. The independence weight coefficient method determines the weight of each element according to the strength of collinearity between each indicator and other indicators. First, use a_u to other influencing factors to get:

$$a_u = \hat{\lambda}_0 + \hat{\lambda}_1 * a_1 + \hat{\lambda}_2 * a_2 + \hat{\lambda}_3 * a_3 \cdots\cdots + \hat{\lambda}_8 * a_8 \tag{1}$$

Among them, $\hat{\lambda}_0 \cdots\cdots \hat{\lambda}_8$ is the parameter to be estimated, which is estimated by linear regression of the corresponding sample data of the same scene or industry big data system [14]. The calculation formula of the multiple is:

$$e_u = \frac{\sum \left(b - \bar{b}\right)\left(\hat{b} - \bar{b}\right)}{\sqrt{\sum \left(b - \bar{b}\right)^2 \sum \left(\hat{b} - \bar{b}\right)^2}} \tag{2}$$

Among them, $\bar{b}$ is the average number of sample data, and $\hat{b}$ is the estimated value obtained by

linear regression of a_u on other influencing factors [15].

Network space characteristics, such as ID, identity, computing power, owning area, operating line, service log, data transfer rate, data loss rate, real-time storage capacity, etc. This lay the foundation for a reliable judgment of the identity of a network site, for example, data provider q_u may There are n interactions with other objects, where the number of successes is v and the number of failures is m, then the trust of the object q_u is estimated as:

$$\text{trust}(q_u) = v/n + \sum_{u_g}^{m_k+m_g} \int_{u}^{g} (s_1, s_2 \cdots, s_n) \tag{3}$$

It should be noted that $\text{trust}(q_u) = v/n$ is the reflection result under ideal conditions. When there is no interaction history or the number of interactions between segments, it will not be enough to directly use $\text{trust}(q_u) = v/n$ to estimate the trust of the target segment.

To sum up, the relationship between the level of trust s and identity + behavior credibility:

$$s = \begin{cases} 0, incredible \\ \dfrac{v}{n}, credible, n \geq iph(3)\left(q^2(1-q)^2 + \dfrac{1}{2}\kappa \right)/\kappa^2 \end{cases} \tag{4}$$

Suppose s-t is the trust threshold. When s>s-t, we call the trust evaluation result of this segment as credible, otherwise, it is not credible.

Suppose the parallel processing data string is composed of $w = (w_1, w_2, w_3 \cdots\cdots w_o)$, and the data supplier corresponding to w is $\{q_1, q_2, q_3 \cdots q_o\}$.

$$ws = s_1 \oplus s_2 \oplus s_3 \oplus \cdots\cdots \otimes s_o \tag{5}$$

Among them, s_u is the trust value of the data provider. $\oplus, \otimes$ is the data reliability quantitative calculation aggregation operator,

2.2 Artificial Intelligence Technology

"Artificial intelligence", as the name suggests, is "artificial intelligence". This is a very broad question. This term was coined at a famous conference in 1955. A study on artificial intelligence may reveal more than the word "artificial intelligence." Artificial intelligence has many possibilities, but it relies on the use of computers to simulate and expand human understanding. Different schools of science have different opinions on whether machines can produce real knowledge without human training. According to the actual degree of computer-aided understanding, artificial intelligence can be divided into two categories: "strong artificial intelligence" and "artificial intelligence". As a person, you may not be able to perceive and understand yourself, and you may even have a completely different understanding of the same person. At the same time, social science distinguishes between "sacred" and "artificial understanding" in terms of creation, society, organization, and human behavior.

With the development of technology, the business world pays more attention to user experience and product profitability. When it comes to project development, engineers are very concerned about the quality of tourism projects and whether these new technologies are effective. The following are some of the key technologies in business development. Many of these technologies

can actually be found. It should be noted that the technology here is a broader concept and is more sensitive to "weak artificial intelligence", but in any case it has played a very important role in the development of tourism.

(1) Path Finding
(2) Finite State Machine
(3) Fuzzy Logic
(4) Bayesian Technology
(5) Genetic Algorithm
(6) Artificial Neural Network
(7) Artificial Life

2.3 Ice and Snow Sports Tourism and Industrial Clusters

The first study on sports tourism was the G and D in Europe in the 1980s. There were many suggestions for the definition of sports tourism. According to the definition of sports tourism by many professionals, sports tourism includes three elements: people, leisure activities and tourism services. However, there is no clear description of the sports tour.

Ice and snow sports, as a lower category of sports tourism, pay more attention to ice sports and ice and snow sports. Some ice and snow sports are shown in Figure 2.

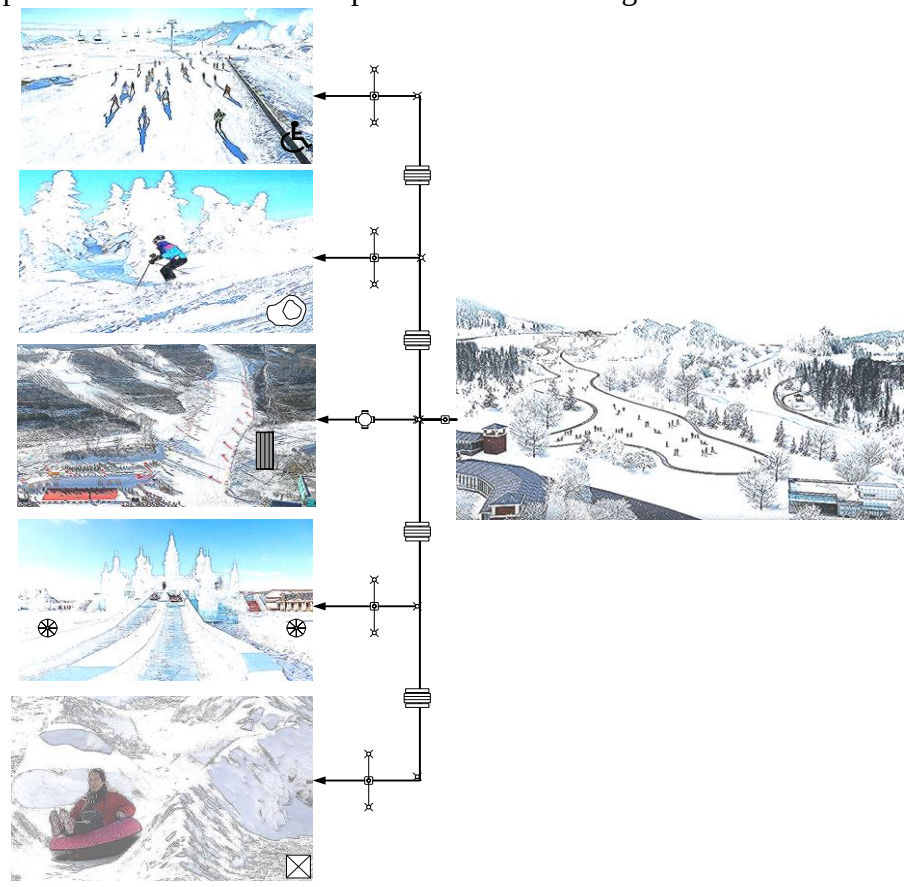

Figure 2: Introduction of related activities

As can be seen from Figure 2, ice and snow sports tourism refers to a complex based on companies that provide ice and snow sports services, including other services that provide support services, and companies that provide basic life services. In this study, we mainly include ski resorts

that provide snow and ice activities, snowboard activities, natural resorts that provide rescue services, and companies that provide basic lifestyle services such as food, housing, transportation, shopping, and sports facilities.

An industrial cluster refers to a global focus formed by companies or individuals in the same competitive industry, and they collaborate in a community. Through the high degree of concentration between companies, business departments have developed scalable systems to reduce business costs and increase business competitiveness in the market. Entrepreneurship not only increases the company's overall competitiveness, but also increases the company's cooperation, the development of its own innovation capabilities and the company's development.

Based on the above three aspects of agglomeration conditions, data collection, and agglomeration effect, a comprehensive positioning index system is constructed, combined with the positioning index, and the travel positioning index is obtained.

$$g_{um} = \frac{\sum_{k=1}^{n}\left[\left(f_{uk} / \sum_{u=1}^{o} f_{uk}\right) / \left(f_{uk} / \sum_{u=1}^{o} uk\right)\right]}{\sum_{k=1}^{n} k} \tag{6}$$

Among them, g is the calculation index, which refers to the location index, and k refers to the above four sub-category calculation indexes.

One sign of the common weakness mentioned earlier is that they can find business plans in specific areas, but they have not determined the specific number, scale, and connections within the company. For convenience, this object analyzes the correlation between the tourism industry and other industries by calculating direct multiplication and perfect power correction. The calculation process of the direct energy factor is:

$$x_{uk} = \frac{a_{uk}}{a_k}\frac{b_{uk}}{b_k}(u,k = 1,2,\ldots,o) \tag{7}$$

The calculation formula of the complete consumption coefficient matrix is:

$$y = (1-x)^{-1} - u\oiiint_{xx_d} u_{kb} + \oiint g_{ft} \tag{8}$$

In the formula, y is the coefficient matrix and x, u, g are all constants.

3. Experiments and Conclusions about the Design and Implementation Method of Research on the Construction of Industrial Clusters Based on Big Data Security and Artificial Intelligence

3.1 System Development and Operating Environment

In the development and realization process of the whole system, C+ computer programming language is mainly used to realize the realization. The development and operation environment involved are shown in Table 2:

The module units created by the big data tourism company mainly include three modules: big data network security, data collection and data construction. The original data collection, data processing and security constructed based on the system's weak data storage are typical tourism databases, which provide data support for the construction of a smart environment. In response to the needs of big data transmission in system design, the system must efficiently implement data

collection. The detailed description of data collection requirements is shown in Table 3:

Table 2: System development and operating environment

Operating environment	Specification	Operating environment	Specification
C+ programming language version	P 2.6.10	Server	GCE 7.12.3
Development Platform	PP 2016.9.1	Operating system	LU 2.15.35
Web service	FLA 1.10.1	Byte	24
Database	MON 3.3.3	Data URL	IEE 4.0.4

Table 3: Data collection requirements

Submodule	Scope	Require	Value
collect	>4.4	Efficient	99.8%
Cleaning	<2.5	Comprehensive	94.5%
capture	>3.1	Real time	96.6%
Construct	>5.4	Precise	95.9%

3.2 Industrial Cluster Construction Settings

The model organizes all interactions with other objects based on the number of interactions of each keyword with a series of keywords, and develops a data sharing network, data exchange process, trust-based transaction process, and data evaluation process. In such a network field that understands business relationships, the environmental characteristics and behaviors of the simulation program is shown in Table 4.

Table 4: Simulation system environment attributes and behavior settings

Attribute name	Attribute identification	Behavior	Reliability assessment
Data rating	M 0.0	Initialization	91.45%
Quantized value	Ws 0.1	Obtain	96.77%
Embodied value	E 0.2	Choose	93.23%
Rating result	Rate 0.3	Renew	92.28%

3.3 Experimental Results and Comparison

A total of 4 sets of comparative experiments were carried out in this experiment. The specific terms and conditions of each test are as follows:

In the 600 rounds of free data simulation simulation on the trading platform, two different evaluation methods were used to classify the transaction result data of the same data transaction event, and the critical value e and the result level were obtained. The test data that is consistent during the evaluation process is used as the probability data as shown in Figure 3. Blue represents the evaluation method for unreliable evaluation equipment, and orange represents the evaluation method for the recommended equipment in this case.

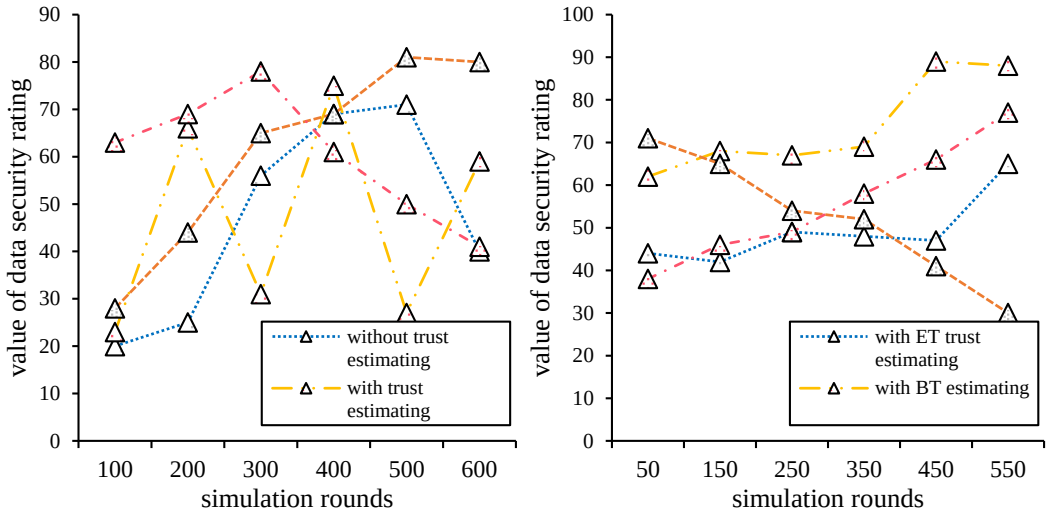

Figure 3: Four algorithms for e comparison

It can be seen from Figure 3 that out of 600 rounds of trading events and grading results, 530 times have the same grading results, and 70 times have similarities and differences. The effective grading rate is 88.3%. Based on the above 4 experimental results, a statistical chart of the data effective grading rate under the data trading platform is obtained, as shown in Figure 4:

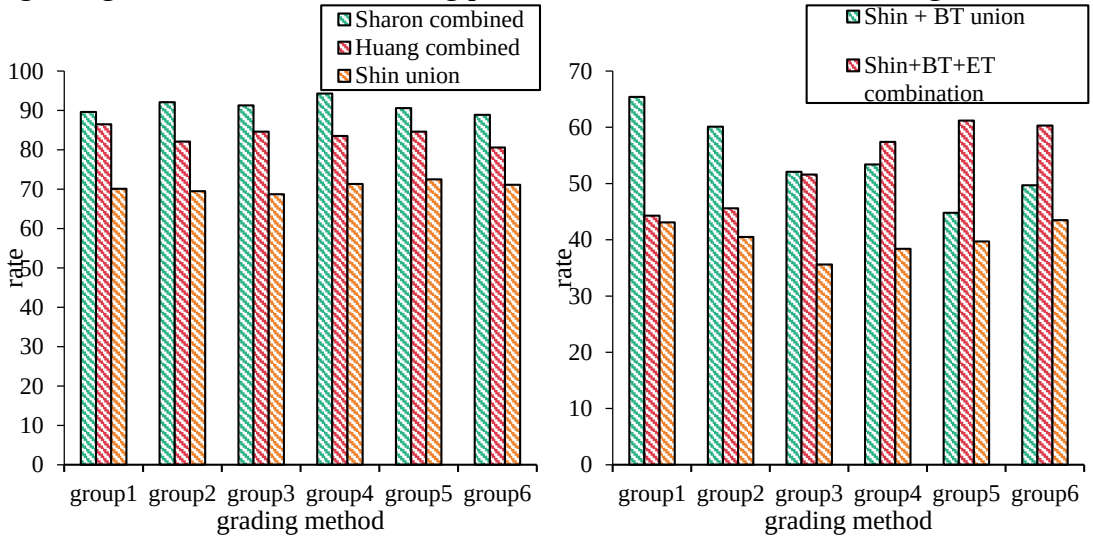

Figure 4: Comparison of effective grading rate

It can be seen from Figure 4 that the effective evaluation rate of the four groups of experimental results is correspondingly reduced. As an alternative evaluation method for safety evaluation, the method in this paper has effective evaluation rates of 91.2% and 88.5%, which seems to indicate that the variability of big data problems in its result rating is also within an acceptable range, but from traditional methods and Starting with this combination of benchmarking devices, the actual interest rate dropped to less than half of 60.5%, 72.8%, or even 44.3%. Then evaluate the performance of the intelligent algorithm proposed in this paper, and the specific performance is shown in Figure 5.

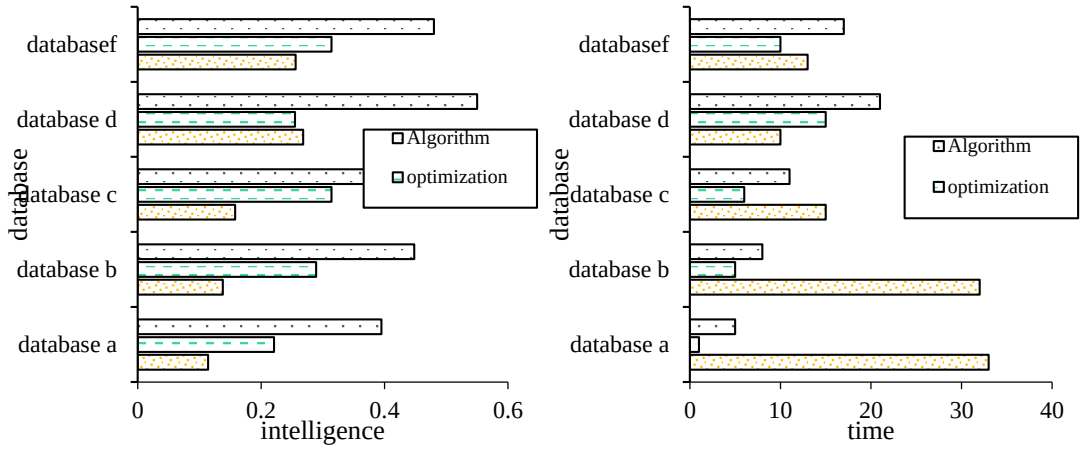

Figure 5: Comparison of search efficiency

It can be seen from Figure 5 that when the shortest search distance is the same as 40, compared with the traditional algorithm, the search intelligence of the algorithm in this paper is increased from 0.114 to 0.241, and the search time is also reduced from 33ms to less than 2.1ms. The advantages of these two aspects indicate that this paper the methods have been improved to a certain extent and can be better applied to industrial resource search.

3.4 Empirical Analysis

This article uses the status of the international tourism industry as a frame of reference to analyze the economic growth of the seven major sectors of the international tourism industry in northern cities. The latest data released by the Tourism Bureau and other institutions and organizations, the time interval is taken from 2000 to 2012. According to the calculation method and process in this paper, the calculation results of different stages can be obtained, as shown in Figure 6.

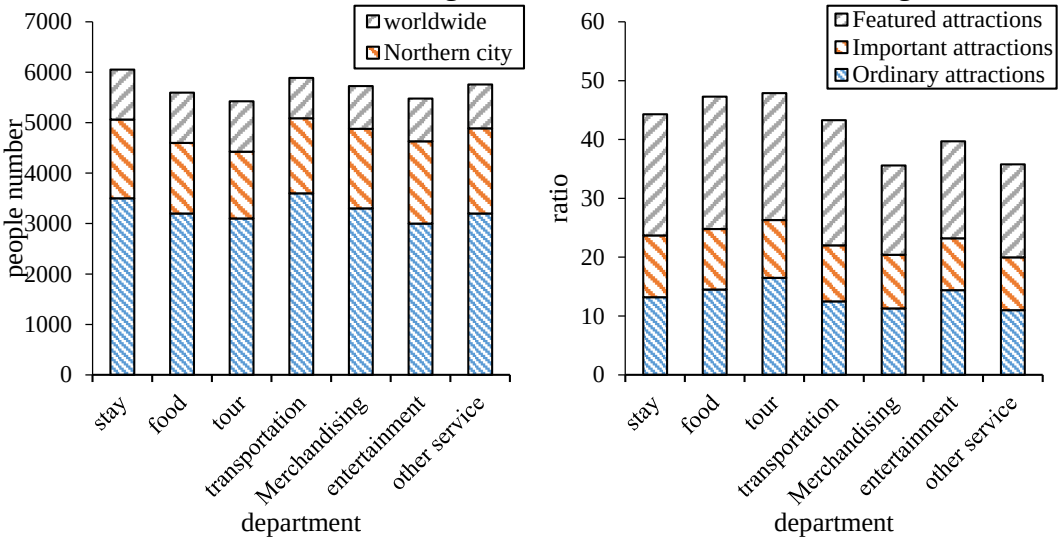

Figure 6: Overall effect table of the international industrial structure of ice and snow tourism

It can be seen from Figure 6 that according to the overall effect analysis of the ice and snow international tourism industry sector structure, compared with the whole country, the tourism growth rate of northern cities in the industrial cluster after application optimization is 19.83, indicating the overall development of various sectors of the tourism industry. The speed is much higher than the national average; the competitiveness effect index v=20.8, the overall

competitiveness deviation component w=22514, indicating that the overall growth momentum of the ice and snow sports tourism industry sectors is good, the overall competitiveness is strong, and it is in a leading position in the country.

4. Conclusion

This article uses business team planning, business planning and optimization process, artificial intelligence technology, big data security technology and sports tourism management system when designing and constructing the industrial cluster model, making it suitable for ice and snow sports tourism. In order to achieve the research purpose, this article uses the bibliographic reference method to extract samples and simplify the algorithm. In terms of case analysis, this article uses the status of the international tourism industry as a reference frame to analyze the economic development of the seven major components of the international tourism industry in northern cities. After optimizing the implementation of the industrial cluster platform, the growth rate of tourism in northern cities is 19.83, the competition effect index v=20.8, and the general competition deviation component w=22514, indicating that the overall development of ice and snow sports tourism is good, with strong competitiveness, and it is the best in China.

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