Balance Analysis of Digital Industry Development Based on Web3.0

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Abstract. In the digital industry, it is very common for enterprises to collect data of customers, suppliers and businesses. For example, users can use products and services to provide valuable user data to improve existing products and services. Digital industry includes not only data industry, but also new products, new industries, new formats and new models brought by the integration of data industry with economy and society. From the emergence to the rapid development of Web2.0 technology, its technology has gradually matured and entered the Web3.0 era. This paper puts forward the path to promote the balanced development of digital industry in China, with a view to providing reference for the balanced development of digital industry in China. In this paper, on the basis of using entropy weight method to determine the weight coefficient, TOPSIS comprehensive evaluation method is added to make a more detailed treatment of the internal evaluation of indicators. The research shows that in the aspect of digital industry development, the weight coefficients of Jiangsu and Zhejiang are similar, being 0.6137 and 0.5374, and the development indexes are 0.1437 and 0.1339; It shows that the development of digital industry core industry and enterprise application in the city area has promoted the development of digital industry in the whole province.

Keywords: Web3.0; Digital Industry; Balance.

1. Introduction

In the past ten years, the vigorous development of digital industry has greatly promoted the deep integration of industries. A series of cross-border integration of new industries, new formats and new modes of digital empowerment have not only become new economic growth points, but also become a powerful kinetic energy for building a modern economic system [1-2]. The digital industry itself is in a high-speed growth stage, and the combination with other economic fields is also promoting the transformation and upgrading of the traditional economic model. The digital industry has become an important driving force for global economic growth, and plays an important role in cultivating new industrial growth points and realizing inclusive and inclusive development. Around the development and application of real-time online data, a data industry ecosystem including digital industry, software, data platform, developers and users has been formed [3-5]. Digital industry includes not only data industry, but also new products, new industries, new formats and new models brought by the integration of data industry with economy and society.

With the rapid growth of Web scale, users' demand for Web applications is no longer just simple query, but knowledge search. From the emergence to the rapid development of Web2.0 technology, its technology has gradually matured and entered the Web3.0 era. This paper puts forward the path to promote the balanced development of digital industry in China, with a view to providing reference for the balanced development of digital industry in China.

2. Characteristics of Digital Industry

In the digital industry, it is very common for enterprises to collect data of customers, suppliers and businesses. For example, users can use products and services to provide valuable user data to improve existing products and services. Especially "big data", which is used to monitor the flow of refugees after natural disasters, to ensure accurate prediction of health risks and to determine aid targets. With the development of enterprises, the relative importance of intangible assets also increases, which leads to the further concentration of intangible assets. According to the current tax regulations, the rights

of these intangible assets can be transferred among related enterprises, so the legal rights of assets may be separated from the development activities of these assets, resulting in the liquidity of intangible assets.

The Internet platform makes use of big data, cloud computing, artificial intelligence and other technologies to connect and gather the production site data, business data, data of each link in the upstream and downstream supply chain, user behavior data, etc. Other new modes of cross-border integration, such as smart supply chain, flexible customization, shared production platform, etc., all achieve data appreciation and economic benefits through the collision and integration of multi-source data. However, from the technical point of view, the Internet is an inclusive technology, and it is also an opportunity for underdeveloped areas [6]. From the perspective of regional development, what are the direct reasons for the "digital divide" and the unbalanced development of digital industries among regions? Is it the policy of local government or the foundation of economic development? This is a question worthy of in-depth consideration.

Web3.0 is an intelligent filter based on user's needs and a diversified demand satisfaction platform. The platform of Web3.0 will be composed of micro-units (i.e., micro-application modules, or unit organizations), and users can create their own information unit modules completely independently. The platform will intelligently handle the integration of massive Internet information according to users' needs, and finally aggregate users' personalized needs. The biggest difference between Web-based data warehouse architecture and traditional C/S-based data warehouse system lies in the addition of Web server and application server. This structure makes it easier to construct an application system based on three-tier logical structure [7-8]. Students can access your data warehouse environment from any location. Therefore, we must consider more security issues and effectively prevent illegal users from entering the data warehouse system. The Web system architecture is shown in figure 1:

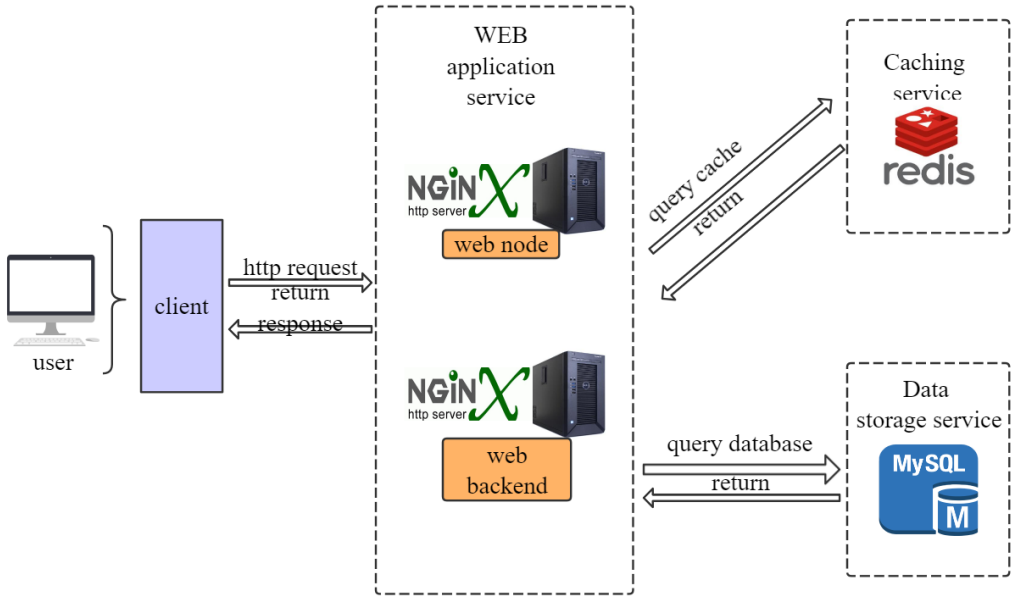


Figure 1. Web system architecture

Network effect is a key feature of many enterprises in digital industry. When compatibility with other users is important, network effect can be seen even when the main purpose of a specific technology may not be to interact with others. In the business model, different aspects of the market can be adjusted according to the developing technology, the latest expression of consumer demand and the dynamic status of enterprises.

Digital literacy in life is mainly digital skills and professional skills. For example, the skills possessed by information technology talents in enterprises are digital literacy. Therefore, improving

people's digital literacy is conducive to stimulating digital consumption and promoting digital production, so digital literacy is one of the key elements in the development of digital industry.

3. Design of Digital Industry Development Evaluation Model

To evaluate the development of digital industry, it is necessary to design an objective and reasonable evaluation method. The traditional evaluation method of digital industry, such as entropy weight method, is one of the most widely used evaluation methods. This method is an important method to determine the index weight and analyze its contribution.

Entropy weight method only quantifies the contribution of the index to the whole, but the analysis of the development intensity of different indexes in the index is not clear enough. Therefore, based on the weight coefficient determined by entropy weight method, TOPSIS comprehensive evaluation method is added to evaluate the index [9]. The combination of the two methods can make up for their shortcomings, so as to achieve scientific, objective, accurate and comprehensive evaluation and analysis.

Because the units and orders of magnitude of the data among the indexes are different in collecting the relevant data of the digital industry development evaluation index system, in order to make the next calculation accurately and conveniently, the data should be standardized at first. In this paper, the range method is used for data processing.

Positive indicators:

$$y_{ij} = \frac{x_{ij} - \min_i}{\max_i - \min_i} \tag{1}$$

Negative indicators:

$$y_{ij} = \frac{\max_i - x_{ij}}{\max_i - \min_i} \tag{2}$$

Where x_{ij} is the original data of the j year of index i, and y_{ij} is the standardized data of the j year of index i after processing. $\min_i$ is the minimum value of index i data in different years, and $\max_i$ is the maximum value of index i data in different years.

According to the information entropy in information theory, the information entropy of a group of data can be calculated according to the following formula:

$$e_j = -\frac{1}{\ln n}\sum_{i=1}^{n} p_{ij} \ln p_{ij} \left(j = 1,2,\cdots,L,p\right) \tag{3}$$

Calculate the weight of each index:

$$w_j = \frac{g_j}{\sum_{i=1}^{p} g_i} \left(j = 1,2,\cdots,L,p\right) \tag{4}$$

On the measurement of industrial agglomeration, domestic and foreign scholars have done a lot of research, and the measurement indicators and methods of industrial agglomeration index are becoming more and more perfect. Looking back at the development of industrial agglomeration measurement methods, there have been simple spatial imbalance index and theoretical support measurement methods [10-11].

The location entropy index refers to the proportion of the output value of the industry to be measured in the designated area to the total output value of the area and the proportion of the total output value of the industry in the whole country to the total output value of the country (the output value can also be replaced by the number of employed people). The specific formula is shown in Formula (5):

$$LQ_{ij} = \frac{\frac{G_{ij}}{G_i}}{\frac{G_j}{G}} \tag{5}$$

Among them, LQ_{ij} represents the aggregation degree of j industry in i region, G_{ij} represents the output value of j industry in i region, and G represents the total national output value. There is a positive correlation between LQ and the degree of industrial agglomeration, that is, the greater the value of LQ, the higher the degree of industrial agglomeration in this area, and vice versa.

Digital industrial development index is a measure of the development level of a certain index in this region. The bigger the value, the better the development. The calculation of development index firstly standardizes the index data, then calculates the weight by using the processed standardized value, and calculates the comprehensive development index by using the obtained entropy weight and the weighted standardized data values over the years. The formula is as follows:

$$Y_i = w_i \sum_{j=1}^{10} y_{ij} \tag{6}$$

Where Y_i is the digital industry development index of the i th index, w_i is the weight coefficient of this index i, and y_{ij} is the standardized value after calculation.

4. Analysis and Discussion of Results

Considering the continuous validity of data and the change of administrative division during the research period, this paper finally collected and collated the panel data of 20 provinces and cities in China from 2015 to 2021 for analysis. According to the data collected from China Statistical Yearbook (2015-2021), China Statistical Yearbook (2015-2021) and statistical yearbooks of various provinces, autonomous regions and municipalities in China, the missing values will appear in some years, and the average values of neighboring years will be used to fill in.

In the aspect of digital industry development, the weight coefficients of Jiangsu and Zhejiang are close, being 0.6137 and 0.5374, and the development indexes are 0.1437 and 0.1339; The weight coefficients of Sichuan and Yunnan are close to 0.3632 and 0.2735, and the development indexes are 0.1138 and 0.1004. In the aspect of digital industry development, the weight of underdeveloped areas exceeds that of developed areas, but there is still a certain distance between the development index and developed areas, which indicates that the digital industry in underdeveloped areas is developing faster. The industrial weight coefficient and development index are shown in Figure 2:

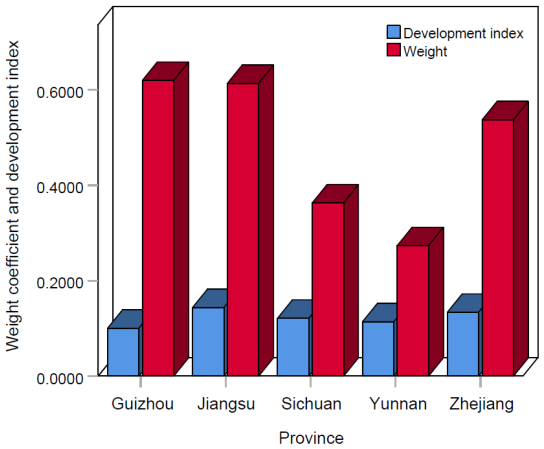


Figure 2. Weight coefficient and development index of digital industry development

Through the above analysis of the classification index, it is found that there are obvious differences in all aspects of the development of digital industry in 10 cities in the province. Through comparative research, it is found that the digital industry in each city in the province forms differentiated development characteristics.

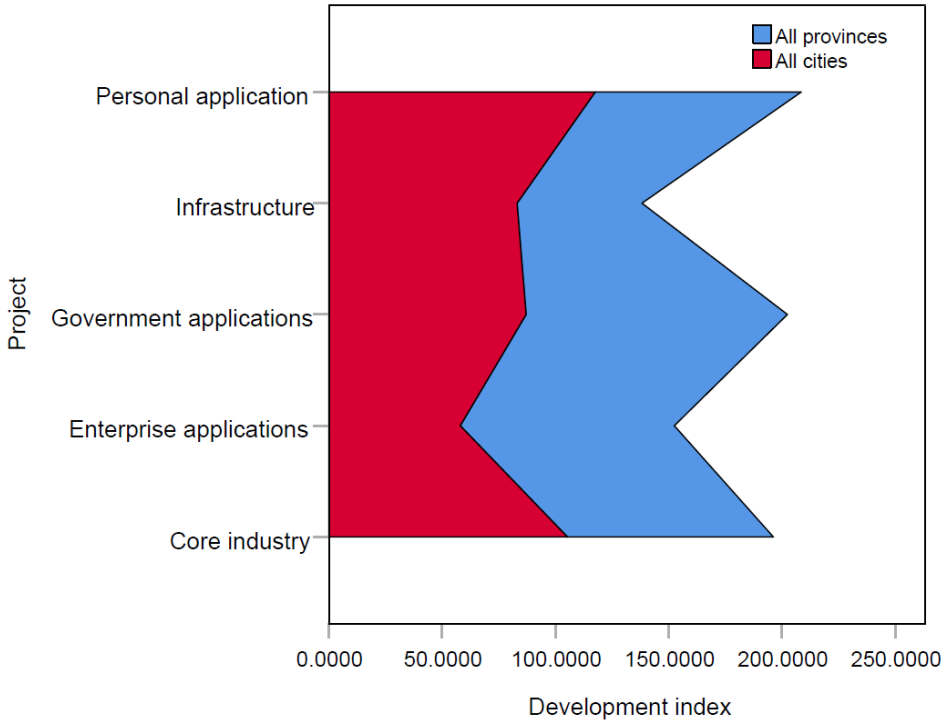


Figure 3. Comparison of the development index structure of regional digital industry between cities and provinces

According to Figure 3, it is found that all indicators of urban areas exceed the development level of the whole province, showing comprehensive leading development characteristics. Among them, the development level of digital infrastructure and government application in urban areas is close to that of the whole province, while the development of digital core industries and enterprise applications in urban areas far exceeds that of the whole province. Therefore, it shows that the development of digital core industries and enterprise applications in urban areas has promoted the development of digital industries in the whole province.

Based on the above conclusions, China should promote the balance of regional digital industry capital investment from the perspective of capital investment; Improve the level of regional economic development, human capital, infrastructure construction, financial expenditure, scientific and technological innovation and opening to the outside world to drive the balanced development of digital industry in China. Keep the regional gap of regional structure, efficiency and scale of digital industry capital investment within a reasonable range, gradually narrow the regional gap, promote the balance of regional digital industry capital investment, and drive the balanced development of digital industry. Improve the level of opening to the outside world, connect the internal and external circulation through digital technology, actively take advantage of the development opportunity of "the belt and road initiative", strengthen the cooperation of digital infrastructure construction among countries along the route, expand the international supply scale of digital products and services, and promote "win-win cooperation" in opening up.

The process of digital empowerment industry integration is the process of digital technology's diffusion and application, integration and symbiosis with traditional technologies, and promoting the digital transformation of traditional industries and traditional enterprises. Actively explore data confirmation, pricing and trading, encourage local data trading platforms to try first, and gradually form rules and systems of data asset evaluation, pricing, trading, pledge, mortgage and dispute

arbitration with China characteristics on the basis of constantly summing up experience. We should constantly explore new modes of open cooperation in digital development, strengthen international cooperation in the fields of technology development, product design and digital infrastructure construction, actively participate in the formulation of digital international rules, and jointly promote data flow, knowledge flow and achievement diffusion.

5. Conclusion

The digital industry itself is in a high-speed growth stage, and the combination with other economic fields is also promoting the transformation and upgrading of the traditional economic model. The digital industry has become an important driving force for global economic growth, and plays an important role in cultivating new industrial growth points and realizing inclusive and inclusive development. From the emergence to the rapid development of Web2.0 technology, its technology has gradually matured and entered the Web3.0 era. This paper puts forward the balance analysis of digital industry development based on Web3.0. The comprehensive development index is calculated by using the obtained entropy weight and the standardized data values after weighting over the years. The research shows that in the development of digital industry, the weight coefficients of Jiangsu and Zhejiang are similar, being 0.6137 and 0.5374, and the development indexes are 0.1437 and 0.1339; The weight coefficients of Sichuan and Yunnan are close to 0.3632 and 0.2735, and the development indexes are 0.1138 and 0.1004; It shows that the development of digital industry core industry and enterprise application in the city area has promoted the development of digital industry in the whole province.

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