Digital Economy Empowering the Transformation of Hainan's Modern Service Industry

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Abstract: *In the context of the digital economy, the development of Hainan's modern service industry faces problems such as rising resource factor costs, shortage of high-quality talents, low service efficiency, and slow industrial digital transformation. Based on the connotation of digital economy empowering the transformation of modern service industry, starting from the development status of Hainan's modern service industry, this article uses SPSS software to research and analyze the influencing factors of Hainan's modern service industry transformation under digital economy empowerment, and then proposes countermeasures for the main influencing factors. This study found that technological innovation capabilities, employee quality, brand reputation, market demand and consumer trends were the main influencing factors for the transformation of Hainan's modern service industry under the empowerment of the digital economy. This article puts forward corresponding transformation suggestions for these influencing factors.*

Keywords: Hainan Modern Service Industry; Digital Economy; Transformation Research; Service Quality.

1. INTRODUCTION

The modern service industry is an important pillar of Hainan's economic development and plays an irreplaceable role in Hainan's economic development [1]. Under the influence of the global COVID-19 epidemic, China's digital economy has grown against the trend, playing an important role in ensuring people's livelihood and promoting the digital transformation of industries [2]. However, Hainan's modern service industry is dominated by tourism, while other business areas are relatively weak. The transformation of Hainan's modern service industry currently faces problems such as unreasonable industrial structure, lack of core technology and innovation capabilities, shortage of talents, insufficient market demand, and insufficient financial support [3]. The development of information technology has a comprehensive impact on traditional industries, and has different characteristics in different industries [4]. The deep integration of information technology and traditional industries will not only help improve industrial efficiency, but also promote industrial transformation and upgrading [5]. The modern service industry must not only follow the inherent development laws and operating methods of the traditional service industry, but also adjust its own operation and management methods according to the demand characteristics of the digital economy era [6]. In recent years, with the rise and promotion of the "Internet +" model, the modern service industry has gradually developed in the direction of digitalization and intelligence.

This article starts from the current situation of the development of Hainan's modern service industry, collects data on relevant influencing factors of Hainan's service industry through questionnaire surveys, and uses the logistic binary analysis method to conduct linear regression analysis on the collected data. By identifying the main influencing factors of Hainan's modern service industry in the context of digital economy empowerment, this article analyzes its existing problems and proposes countermeasures and suggestions to accelerate the transformation and development of Hainan's modern service industry empowered by the digital economy.

2. RELATED WORK

In order to solve the problem of transformation and upgrading of the service industry, relevant scholars have conducted research in this area. Among them, Zhang K studied the construction strategies of Sanya smart tourism under the background of free trade port construction [7]. Manser Payne E H studied the digital transformation method of the financial services ecosystem by building a digital service value co-creation framework for artificial intelligence services [8]. Liu H studied industry product development and service innovation [9]. Some scholars have also conducted research on the service industry in different regions and different periods, and found that the transformation and upgrading of the service industry needed to be constantly connected with the times and

technology [10-11].

The research of these scholars has provided valuable methods and ideas for the transformation of Hainan's modern service industry, but the transformation of Hainan's modern service industry in the context of digital economy empowerment requires more in-depth empirical research. Therefore, this article will further explore the impact and role of the digital economy on the transformation and development of Hainan's modern service industry through in-depth investigation and analysis of the current situation and problems of Hainan's modern service industry, combined with the theoretical framework of digital economy empowerment. Kim D H used binary logistic regression analysis to study the factors affecting the position of the sphenoid sinus opening [12]. Salwa L analyzed the most important factors affecting the instability of marital life in the Kingdom of Saudi Arabia through binary logistic regression [13]. Therefore, this article will also use the binary Logistic method to study the main factors affecting the transformation of Hainan's modern service industry, and propose specific and feasible countermeasures and suggestions to promote the transformation and upgrading of Hainan's modern service industry, and provide useful reference for relevant decision-makers and practitioners.

3. SPSS SOFTWARE ANALYSIS METHOD

3.1 Variable Setting

This article analyzes the factors influencing the modern service industry in Hainan. The internal factors include organizational structure, management capabilities, technological innovation capabilities, employee quality, teamwork capabilities and brand reputation. External factors include the level of economic development, industry competition landscape, market demand and consumer trends. The influencing factors are shown in Figure 1.
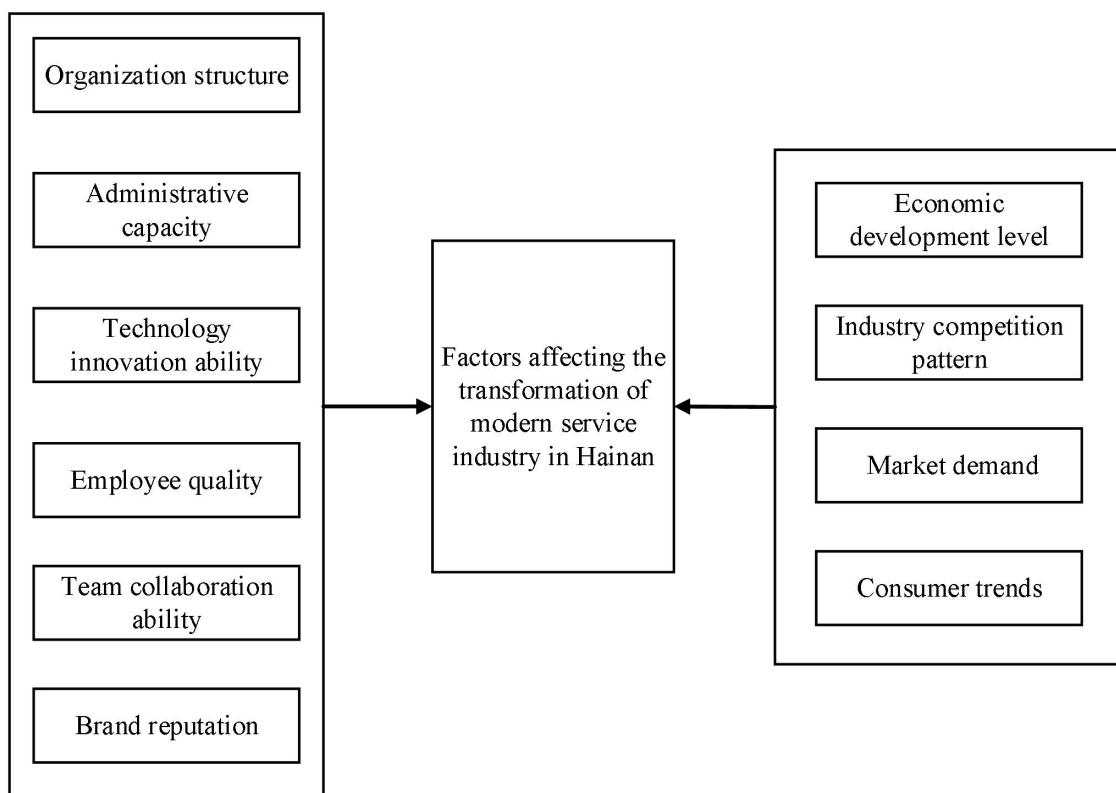

Figure 1: Factor analysis structure

This article uses the factors in Figure 1 as independent variables and the income after structural adjustment of the modern service industry in Hainan as the dependent variable. When the profit increase is greater than 10%, it is judged as a success; otherwise, it is judged as a failure; customer satisfaction is used as the explanatory variable 2. In this study, the variables to be explained include: company profit exceeding 10%, customer satisfaction, etc., all of which are second-category variables. If it is, then the value is 1, otherwise it is 0. This article assigns variables to each item, as shown in Table 1.

Table 1: Variable assignment

Variable symbol	Variable	Variable assignment
Y1	Profit growth exceeds10%	1= Yes; 0= No
Y2	Customer satisfaction	1= Yes; 0= No
X1	Organization structure	1=Very bad;
X2	Administrative capacity	2= Range;
X3	Technology innovation ability	3=Commonly;
X4	Employee quality	4= Preferably;
X5	Team collaboration ability	5=very good
X6	Brand reputation	
X7	Economic development level	1=The impact on the enterprise development is very small;
X8	Industry competition pattern	2=Less impact on the development of enterprises;
X9	Market demand	3=The impact on the enterprise development is general;
X10	Consumer trends	4=It has a great impact on the development of enterprises; 5=Great impact on the development of the enterprise

3.2 Model Construction

This article uses profit exceeding 10% and customer satisfaction as explanatory variables, both of which belong to two types of variables. Therefore, a binary logistic model is used to conduct an empirical study on each factor. Two questions are set for the explained variables, one is whether the profit growth exceeds 10%, and the other is whether the customers are satisfied. If yes, then y takes the value 1, if not, then y takes the value 0. In the probabilistic prediction model of this article, P represents the probability of profit exceeding 10% or customer satisfaction, X_i is the independent variable, n represents the number of influencing factors, β_i is the corresponding coefficient, and the function expression of binary logistic regression for:

$$p(Y_i = 1 / X_i) = p[\varepsilon_i \leq (\beta_0 + \sum_{i=1}^{n} \beta_i X_i)] \tag{1}$$

Among them, ε is the error term and Y is a binary variable. Then the probability (odd) of whether the transformation is successful is:

$$odd = \frac{p_i}{1 - p_i} = e^{\beta_0 + \beta_i X_i} \tag{2}$$

Using this qualitative analysis method, we can further clarify the significant factors affecting the transformation of Hainan's modern service industry.

3.3 Data Sources

The data source of this article mainly comes from questionnaire survey. Questionnaires are a commonly used method of collecting information. By asking specific questions of the interviewees, we can understand the opinions and actions of the interviewees. To this end, this article collects the development status of the modern service industry in Hainan from both internal and external aspects through a questionnaire. This study selects 100 representative modern service companies in Hainan as the research objects. Through data processing and related principal component analysis of the questionnaire data, objective and credible data support is obtained. A total of 200 questionnaires were distributed in this article, and 195 were recovered, with a recovery rate of 97.5%.

4. ANALYSIS OF FACTORS INFLUENCING THE TRANSFORMATION OF HAINAN'S MODERN SERVICE INDUSTRY EMPOWERED BY THE DIGITAL ECONOMY

4.1 Reliability Analysis

The reliability analysis of this article will be conducted using Cronbach's Alpha coefficient to evaluate whether the

data collected by the questionnaire is authentic. The internal consistency data from the reliability analysis are shown in Figure 2.
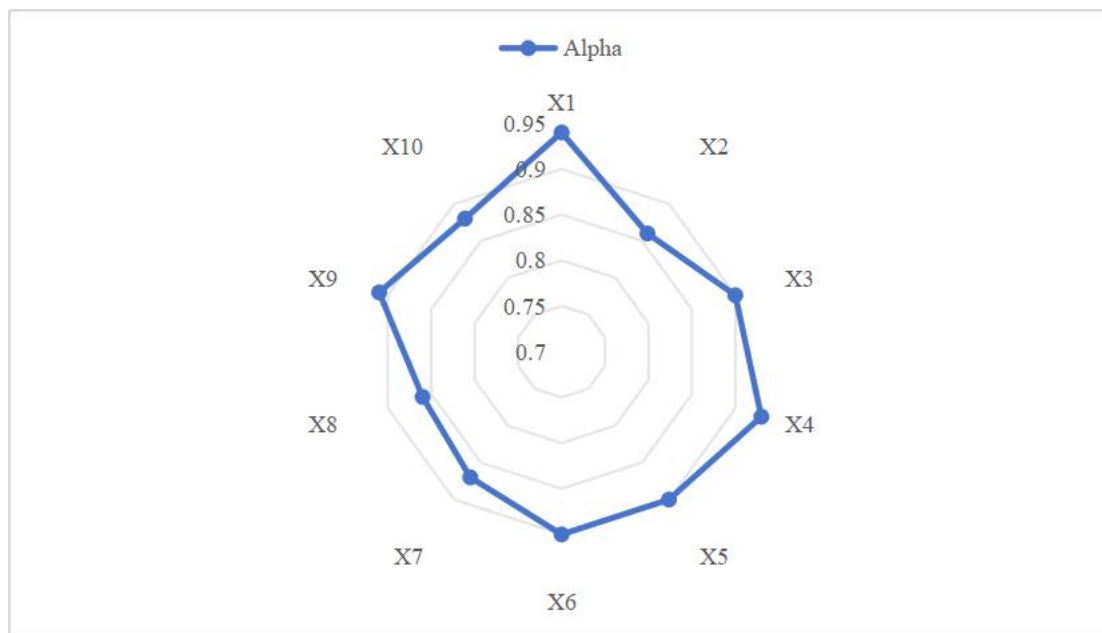

Figure 2: Internal consistency

For internal consistency data, the larger the coefficient is, the higher the credibility and authenticity of the questionnaire are, and it can better reflect the real data and situations. It can be seen from Figure 2 that the coefficients of variables are distributed between 0.86-0.94, and these values are all above 0.85, indicating that the data in this article are highly reliable and can be used for subsequent analysis of influencing factors. At the same time, the high values of each factor also indicate that there is a high correlation between the factors, thus better revealing the interrelationship between the factors. Therefore, the research results of this article will provide more theoretical basis for statistical analysis and correlation analysis in reality, thus laying a good theoretical foundation for subsequent analysis and analysis.

4.2 Validity Analysis

In addition, this article conducts validity analysis through Kaiser-Meyer-Olkin (KMO) and Bartley's sphericity test. The analysis results are shown in Table 2.

Table 2: KMO-Barlett test

KMO		0.8678
Bartlett	Free degree	198
	Conspicuousness	0.000
	Approximate chi square	4306.87

As can be seen from Table 2, the KMO value of the factors selected in this article is 0.8678, the degree of freedom is 198, the approximate chi-square reaches 4306.87, and the significance is 0. These results show that the internal consistency and reliability of each factor are very high, and it has passed Bartley's test of sphericity, meeting the needs of factor analysis. This result also confirms the reliability of the data, indicating that the selected factors have high reliability and interpretability. The KMO value above 0.5 is considered qualified, and the value above 0.8 is considered good. The KMO value in this article is 0.8678, indicating that there is a good correlation between the selected factors and can be used for factor analysis.

4.3 Statistical Analysis of Variable Characteristics

Based on the above analysis, it is found that the data in this article are reliable and consistent. In order to analyze the overall data, this article analyzes the data through descriptive statistical analysis methods. The variable characteristic data collected in this article is shown in Figure 3.
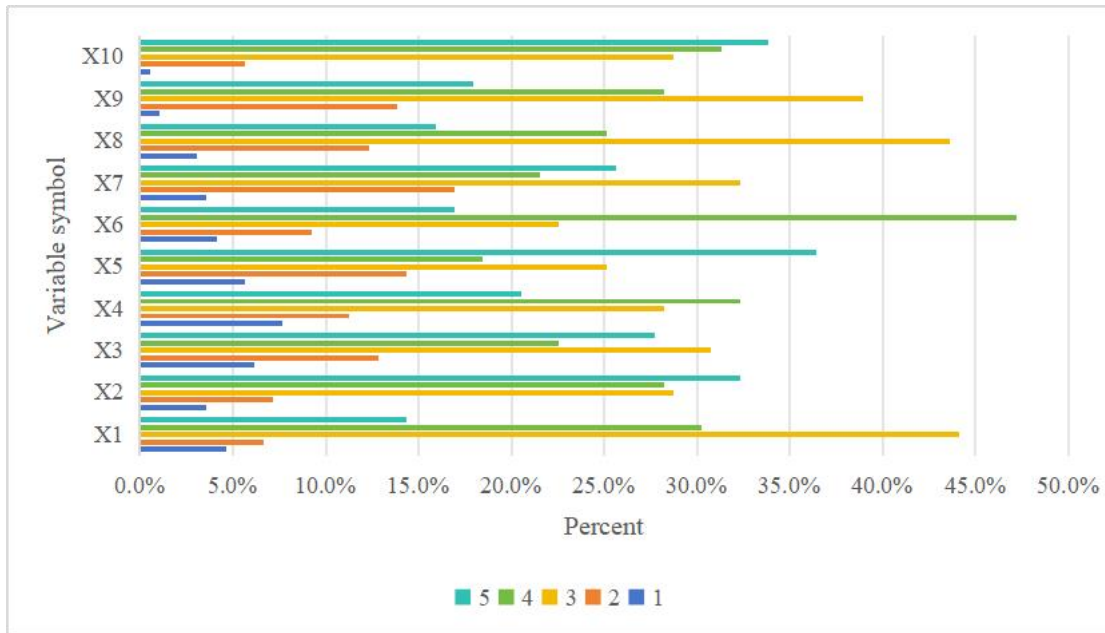
Figure 3: Statistical chart of proportion of independent variables

As can be seen in Figure 3, 47.2% of those who participated in the survey believe that trademark reputation has a greater impact on corporate development, and 33.8% believe that consumer trends have a great impact on corporate development. 32.2% of people think that management ability is very important, and 3.2.3% of people think that employee quality is also important. In addition, this article also collected data on whether these enterprises have successfully transformed, as shown in Figures 4 and 5.
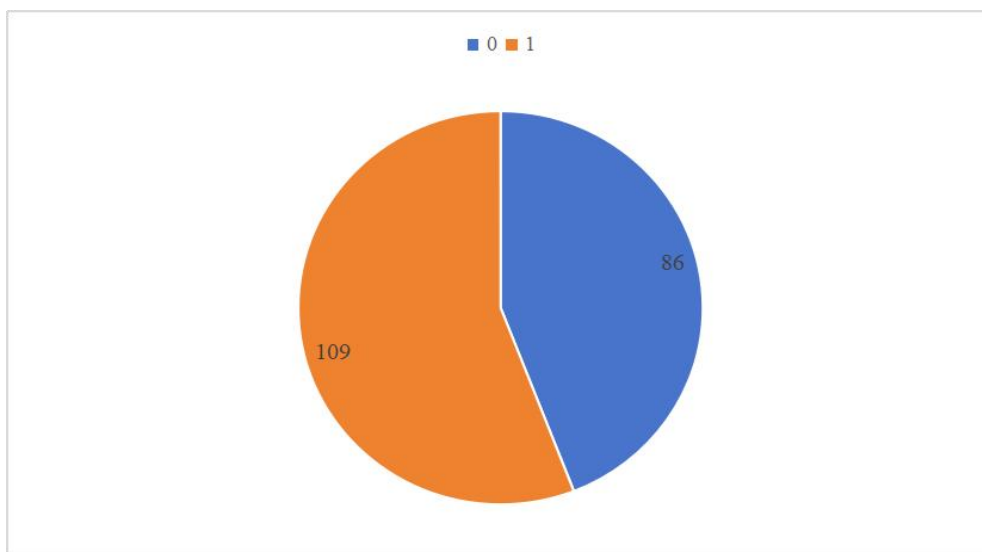

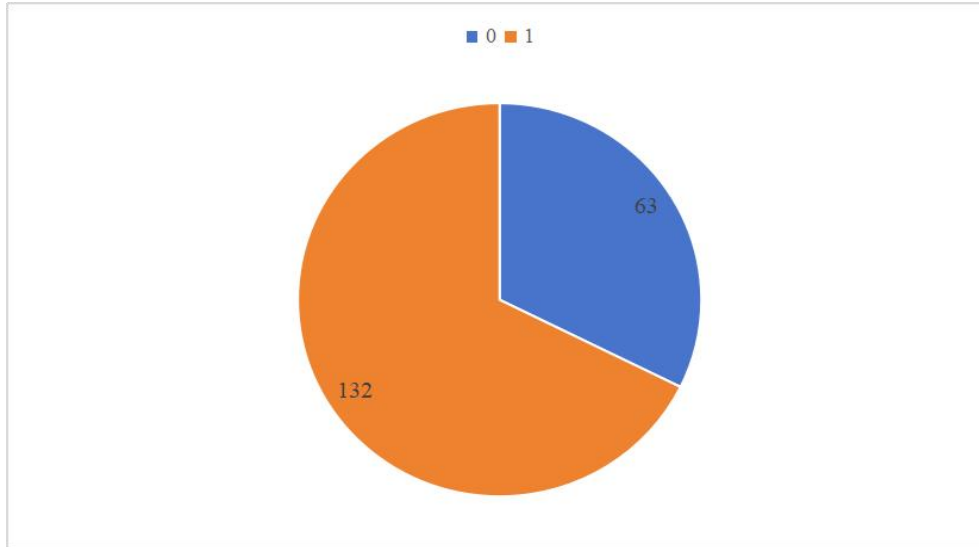**Figure 4:** Data statistics of dependent variable 1

Figure 5: Data statistics of dependent variable 2

As can be seen from Figures 4 and 5, 109 people work for companies whose profits exceed 10%. The data reflects that some of the respondents' companies are in good profitability, which means these companies have strong market competitiveness and profitability. 132 people said that customers were satisfied with the service, which means that these companies have done relatively well in customer relationship management and service quality. This has certain implications for companies to improve customer satisfaction, maintain customer loyalty, and improve market reputation.

4.4 Analysis of Regression Results

The data was processed through the binary Logistic model established in this article, and SPSS23 software was used to analyze the significance of factors affecting Hainan's modern service industry on the collected data. The analysis results are shown in Table 3.

Table 3: Regression analysis results

Variable symbol	Coefficient	Conspicuousness
Y1	0.47	0.831
Y2	0.88	0.136
X1	0.79	0.216
X2	0.36	0.603
X3	1.61	0.015
X4	1.23	0.036
X5	1.45	0.264
X6	1.76	0.028
X7	1.79	0.503
X8	1.66	0.769
X9	1.05	0.039
X10	1.32	0.044

The data in Table 3 shows that the values of factors such as organizational structure, management capabilities, teamwork capabilities, economic development level and industry competition pattern are greater than 0.05. It shows that the impact of these factors on the transformation of Hainan's modern clothing industry is not significant. The study found that the significance values of technological innovation capabilities, employee quality, brand reputation, market demand and consumer trends were <0.05, indicating significance. And the coefficients of these significant influencing factors are all positive, indicating that these factors are positively correlated with the transformation of Hainan's modern service industry.

4.5 Transformation Methods of Hainan's Modern Service Industry

In terms of strengthening technological innovation capabilities, it is necessary to accelerate the cultivation of new industries, new formats and new models of the digital economy, and encourage Hainan enterprises to carry out

digital transformation. At the same time, it is necessary to strengthen the construction of scientific and technological innovation platforms, attract high-level domestic and foreign R&D institutions and scientific researchers to settle in Hainan, and support Hainan enterprises' independent research and development and transformation of scientific and technological achievements.

In terms of improving the quality of employees, the number of universities and disciplines in Hainan is relatively small, resulting in a mismatch between the talent supply and the development needs of the modern service industry. Therefore, it is necessary to strengthen the discipline construction of colleges and universities, continuously optimize the professional settings of colleges and universities, and meet the demand for talents in the modern service industry. It is necessary to strengthen the cultivation of existing talents, including strengthening the training and practical training of existing talents. On the other hand, it is necessary to establish and improve a talent incentive mechanism and an effective promotion system.

In terms of brand building, at present, Hainan's service industry has formed many well-known service brands, such as: "Haizhibao" tourism service brand, "Pearl of the Orient" jewelry service brand, "Hainan Duty Free Shop" shopping service brand, "Yendao Home" health and elderly care service brand and so on. In the future, Hainan needs to build a number of service brands to expand its influence and reputation through brand effects, establish a competitive tourism and cultural service corporate image, and improve its own competitiveness. In market competition, corporate image is an intangible asset of an enterprise and plays an irreplaceable role in the tourism service industry. Hainan should use government guidance and industry self-discipline to shape the image of a number of competitive tourism and cultural enterprises and create high-quality tourism routes and tourist attractions. Hainan should follow the requirements of high-quality tourism routes and combine regional advantages and characteristic cultural resources to design a number of attractive and distinctive high-quality tourism routes and scenic spots, fully explore Hainan's local cultural connotations and folk customs, and enhance Hainan's tourism image and reputation.

In addition, Hainan Province should continue to keep up with market demand and consumer trends, improve the modern service industry management legal and regulatory system. The government should actively guide the traditional service industry to transform into the digital economy, include it within the scope of modern service industry transformation and development planning and policy support, and support enterprises to increase investment in digital transformation. The government should establish and improve the information security supervision system, formulate complete information security supervision standards, and prevent risks caused by information leakage and tampering.

5. CONCLUSION

This article studies the influencing factors of Hainan's modern service industry, uses SPSS software to analyze the influencing factors of the transformation of Hainan's modern service industry under the empowerment of the digital economy, and finds that technological innovation capabilities, employee quality, brand reputation, market demand and consumer trends are the main factors influencing the transformation of Hainan's modern service industry under the empowerment of the digital economy. Moreover, in response to these influencing factors, this article puts forward corresponding countermeasures and suggestions, providing certain theoretical guidance and practical reference for the transformation of Hainan's modern service industry under the empowerment of the digital economy, so as to promote the high-quality development of Hainan's modern service industry.

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