Research on Business Operation Mode of A Cultural and Creative Enterprise under the Background of Artificial Intelligence

Shixin Zhang[1, *], Xinyang Liu[2], Rui Zheng[1], Meng Fang[1], Yue Xu[2], Zejiong Zhou[1]

[1]School of Economics, Anhui University of Finance and Economics, Bengbu, Anhui 233030, China

[2]School of Management Science and Engineering, Anhui University of Finance and Economics, Bengbu, Anhui 233030, China

*1043655068@qq.com

Abstract

With the rapid development of China's economy and the gradual upgrading of residents' consumption structure, people's ideas have changed from "material consumption" to "spiritual and cultural consumption", which has stimulated the rapid development of China's cultural and creative industries to a large extent. With the adjustment of the economic structure by the Chinese government, the relevant policies of the cultural and creative industries have been continuously introduced, and the added value of cultural and creative industries and related industries has increased year by year. However, how to realize the commercial operation of cultural and creative enterprises is a difficult problem under the background that museums are difficult to achieve the growth of offline passenger flow, cultural and creative products lack creative innovation and lovers lack communication. Through the research of simulating the business operation mode of A cultural and creative enterprise and the statistics of the questionnaire, this paper has carried out multiple linear analysis, correlation analysis, ordinary least squares estimation and regression analysis. In order to highlight the practicability of the commercialization model of cultural and creative market in the context of artificial intelligence, this paper mainly uses the case analysis method to analyze the operation status of the simulated A cultural and creative enterprise and explore the possibility of cultural and creative market innovation from different angles.

Keywords

Cultural and Creative; Enterprises; Artificial Intelligence; Regression Analysis.

1. Introduction

1.1. Research Background

With the rapid development of China's society and economy, the consumption structure of residents has gradually upgraded from "material consumption" to "spiritual and cultural consumption", which has also greatly stimulated the rapid development of China's cultural and creative industries. In recent years, the Chinese government has actively launched various policies to promote the development of cultural and creative industries, which has led to the increasing enthusiasm of social forces for investment in cultural and creative industries. Cultural and creative products and services are rich and colorful, and the added value of cultural and related industries has increased year after year. From 2010 to 2018, the added value of China's cultural and related industries increased from 1105.2 billion yuan to 3873.7 billion yuan, with a compound growth rate of 16.97%/year, and its proportion in GDP increased from 2.75% to 4.21%/year, showing a steady growth trend year by year.

In the field of cultural and creative industries, in recent years, major museums or popular IPs have designed and produced unique cultural and creative products, each with its own style. Some are based on cultural relics, such as the cultural and creative products of the Palace Museum and the Shaanxi History Museum, and some are based on popular IPs, such as the cultural and creative peripherals designed on the basis of popular IPs, such as Sword Net III, Hero Alliance, and Tomb Robbing Notes.

Artificial intelligence is a discipline that researches, develops and simulates human behavior, and attempts to make computers simulate human intelligence and reproduce human behavior. It is called Artifical Intelligence in English, or AI for short. In the era of big data, the related technologies of artificial intelligence are receiving more and more attention. The voice of artificial intelligence products in the market is growing. Many technology companies have begun to carry out the strategic layout of artificial intelligence. It can be said that "artificial intelligence+" is the trend of the era.

1.2. Research Significance

(1) Theoretical significance. Since the era of artificial intelligence, more and more people have realized the importance of studying business models under the Internet. The progress of science and technology has swept the birth of a new trend. In the mainstream business model operation research, the composition and realization of value is the best way for enterprises to realize business operation. Through this research, we will use abstract theory to simulate the business operation of cultural and creative enterprises, use theory to guide practice, and then get the feasibility of theory from practice.

(2) Practical significance. This paper is mainly devoted to studying the concept of combining museum online and offline, and exploring a new cultural and creative development future combining intangible cultural heritage, history, exhibition and innovation. By studying the operation of cultural and creative enterprises A in the market, analyzing the difficulties of cultural and creative enterprises in the initial stage, studying the market pain points, and striving to solve the difficulties, attract users, promote the transformation of the museum industry, while developing the upgrading and development of the cultural and creative market, at the same time, it can also effectively promote the employment of the labor force, and explore more cultural and creative works that should be remembered by people. At the same time, it can also provide a business model for many cultural and creative enterprises in the market, which has a certain reference for the commercialization of cultural and creative enterprises.

1.3. Research Status

From 2010 to 2013, the Forbidden City successfully solved the problem of cultural and creative products from nonexistence to existence, from single variety to rich categories. Visitors can choose and buy cultural and creative products with the characteristics of the Forbidden City online or offline. Taking products as the core, developing the Internet economy and developing the emerging cultural and creative economy is the answer given by the Palace Museum, which combines the museum bearing the ancient history with the emerging technology stirring the innovative culture, and its development will have unlimited possibilities in the pulse of the times.

Now, in the fourth industrial revolution, everything can be "Internet plus" and "AI+". Industrial integration is the only way to explore new products, new formats and new models of cultural industry. In the process of digital transformation of the cultural industry, strengthening the integrated development of cross-industries and the regional cluster effect of industries is actually the key measure to strengthen the deep integration of the digital economy and the real economy. In this era of information and digital big data, the cultural and creative industry also needs new innovations to meet people's growing spiritual and cultural needs.

2. Theoretical Basis

As the speed of China's modernization continues to increase, the cultural and creative industries have penetrated into various industries and have a trend of multi-directional interaction and integration. The 2019 National Innovation-driven Development Strategy Outline of the CPC Central Committee and the State Council specifically pointed out that traditional handicraft practitioners should always bear in mind the responsibility and responsibility of inheritance and strive to be the inheritors of traditional culture and art. The 13th Five-Year Plan promoted the cultural and creative industry to the pillar industry. During the "14th Five-Year Plan" period, the potential of the cultural and creative design industry was further released. The business analysis of cultural and creative enterprises should not be carried out on paper, but must be carried out on the ground, and the industry should be analyzed from the perspective of enterprises.

Business model is a derivative of scientific and technological development, especially in information network technology. The research results of business model in this field are particularly rich, and its application scope has gradually expanded. It has already stepped out of the field of information management, covering many industries, and some enterprises have paid attention to the development status of business model. Generally speaking, the business model consists of three parts: First, it is targeted at the participants in the business process, which has a business model system composition. Second, the mutual interests of relevant participants. It can accurately describe the income sources introduced by the model. The business model is divided into operation perspective, profit perspective, strategic positioning, and system theory. Studying different business operation modes can better grasp the core principles of business, thus analyzing the profit and loss relationship between consumers and producers from the perspective of business, so as to estimate the cash flow, profit relationship and business value of enterprises.

3. Analysis of Simulated Enterprise Operation

3.1. Source and Application of Funds

The registered operating cost of the enterprise is about 3 million yuan. Among the sources of funds for various activities of the enterprise, the company's investment is the most important source of funds. We will explain the market prospect and business philosophy of the project to investors to attract investors to invest in the project. This part of funds accounts for about 60%. In addition, special loans are also part of the source of funds. Under the wave of innovation and entrepreneurship, the policy has certain support for the project, and obtaining special loans from the government is the shortcut for the project funds. This part accounts for about 25%. The self-raised capital of team members accounts for about 15%, which is used as working capital to deal with emergencies.

3.2. Use of Funds

(1) Early research and development funds. Enterprises need to purchase relevant equipment and research and develop apps. The initial funds include equipment costs and app development and listing costs. (2) Publicity and design. Design publicity posters, product logos, etc. (3) Salary of offline promotion personnel. Basic wages and rewards for employees according to their work. (4) Signing fee. Cooperation fees with online red and live broadcast platforms. (5) Expand the market. Travel expenses required during data collection. (6) Working capital. Daily expenses for the improvement and operation of APP. See the following table for the purpose of each part of funds:

Table 1. Details of fund use

Serial number	Entry name	Required expenses (10000 yuan)
1	Early research and development	70
2	Publicity design	8
3	Personnel salary	20
4	Signing fee	10
5	Expand the market	5
6	working capital	45

3.3. Prediction of Industrial Investment and Operation Effect

We have simulated the investment period and operation period of the enterprise for five years, and the predicted operation effect is as follows:

Table 2. Enterprise investment and operation effect forecast (unit: 10000 yuan)

Serial number	Entry name	Investment period	First year	Second year	Third year	Fourth year	Fifth year
1	Turnover		55	82.5	99	108.9	108.9
2	Development costs, operation and maintenance costs	60	18	18	18	18	18
3	Sales expenses		20	10	5	5	5
4	Operating profit	-60	17	54.5	76	85.9	85.9
5	Income tax (tax rate 15%)		2.55	8.175	11.4	12.885	12.885
6	Net operating cash flow	-60	14.45	46.325	64.6	73.015	73.015
7	Accumulated net operating cash flow (profit)	-60	-45.55	0.775	63.375	73.79	73.79

4. Statistical Analysis

In the cultural and creative market, seeking cooperation with museums is the key for enterprises to break through the crisis. Let's take Sichuan Provincial Museum as an example and use stata13.0 as a statistical application tool to study the data.

4.1. Correlation Study

In order to more scientifically and objectively explore the impact of Sichuan's cultural and creative industries on the local economic market, this paper regards the value-added of Sichuan's cultural and creative industries as the value-added of the development of Sichuan's cultural and creative industries, and the variable of economic development is expressed by the value-added of Sichuan's GDP. Among them, the value-added of cultural and creative industries in Sichuan Province is X, and the value-added of GDP in Sichuan Province is Y.

By observing the results of the correlation test, we can see that the explained variable Y has a strong direct correlation with the three explanatory variables X1, X2 and X3. Based on this, we establish a multiple linear regression model. We selected data from 2019 to 2022.

In order to avoid false regression and ensure the validity of the estimation results, the stationarity of each panel series must be tested. At the same time, because there are many phenomena that the time series is not stable when fitting the dynamic regression model, this paper must first check the stability of each series on the premise that the time series is stable by default. We adopt the unit root test to test the stationarity of the sequence. There are three main test methods: ADF test, PP test and DF test. Because PP test and DF test do not use this

data, this paper will use the ADF test method in Stata for unit root test.

Table 3. Pairwise correlation between variables

	Y	X1	X2	X3
Y	1			
X1	0.3811	1		
X2	-0.67	-0.6585	1	
X3	0.9151	0.2373	-0.7032	1

4.2.   Ordinary Least Squares Estimation

In stata13.0, for model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$, multiple regression analysis was performed. Among, β_j (j=1,2,3) is called the regression coefficient of the explanatory variable, ε is called random error term, and the regression results are shown in Table 2. Because of constant term β_0 during the test, it was found that at the 5% significance level, the P value was far greater than 0.05, and the result was 0.815. The original assumption that the constant term was zero was accepted, so the constant term was not significant, and it could be deleted. The multiple linear regression equation is as follows.

$$Y = 0.0887X_1 + 9.152X_2 + 4.464X_3$$
$$(3.88) (2.26) (12.47)$$

$R^2 = 0.8798, \ \overline{R}^2 = 0.8717, \ F=107.40$

Table 4. Ordinary Least Squares Results

Y	Coef.	St.Err.	t-value	p-value	95% Conf	Interval]	Sig
X1	0.089	0.023	3.88	0.000	0.043	0.135	***
X2	9.152	4.049	2.26	0.029	0.992	17.313	**
X3	4.464	0.358	12.47	0.000	3.742	5.185	***
Constant	32000000	136000000	0.23	0.815	-243000000	307000000	
Mean dependent var		454436904.554		SD dependent var		81694184.092	
R-squared		0.880		Number of obs		48.000	
F-test		107.396		Prob > F		0.000	
Akaike crit. (AIC)		1790.473		Bayesian crit. (BIC)		1797.958	
*** p<0.01, ** p<0.05, * p<0.1							

4.3.   Analysis of Regression Results

By observing the results of Granger causality test, we can see that the original hypothesis is valid when the number of lag periods is 2. The per capita GDP of Sichuan Province has no Granger effect on the added value of cultural and creative industries in Sichuan Province, indicating that there is no single causal relationship between the per capita GDP of Sichuan Province and the added value of cultural and creative industries. On the contrary, when the confidence level is at least 95%, the existence of the test results can consider that the added value of Sichuan's cultural and creative industries is the Granger reason for Sichuan's per capita GDP. It can be seen that there is a one-way causal relationship between the added value of cultural and creative industries in Sichuan Province and the per capita GDP of Sichuan Province. The results of Granger causality test show that the development of cultural and creative industries in Sichuan Province has a significant impact on its economic development. From the figure, we can see that the critical value result of F statistics is $F_{0.05}$ (3, 44) =107.40, indicating that the linear relationship of the model is significant. Then we carry out t test for three related explanatory variables. Under the condition of n-k-1=44 degrees of freedom, we can know that when the significance level is 5%, except for the constant term β_0, the P value of other

explanatory variables is less than 0.05, and the original hypothesis H0 is strongly rejected: $\beta_1=0$, $\beta_2=0$, $\beta_3=0$, accept the alternative hypothesis. However, the constant term β_0 during the test, it was found that under the 5% significance level, the P value was far greater than 0.05, and the result was 0.815. We accepted the original assumption that the constant term was zero, so we can know that the constant term was not significant, and we can delete it.

In the above, we can obtain the point estimate of the t-test by entering the command regeress Y X1 X2 X3 in stata13.0. Next, we further analyze and estimate the interval of each explanatory variable to estimate the most likely value range of the regression coefficient of each explanatory variable. In data statistics, in general, the higher the confidence level is, the closer the relationship between the explanatory variable we choose and the explained variable is, and the smaller the confidence interval is, the better.

5. Conclusion

In the context of AI and Internet plus, how cultural and creative enterprises break through the constraints of the existing pattern plays a particularly important role in the growth and development of enterprises. The desolation of a major theme museum of cultural and creative industries is bound to bring silence to the whole industry. Under this background, cultural and creative enterprise A, as we envision, chooses to cooperate with museums, use its active online traffic to drive offline museum visits, which are now affected by the epidemic, and through the current excellent AI technology and Internet plus technology, to achieve new technology service market and new products drive market. Through the analysis of this article, we can also know that the cooperation between cultural and creative enterprises and museums must be rational and profitable. We believe that the research of this article can provide ideas for cultural and creative enterprises that are also breaking the boundaries and escort the prosperity of China's cultural and creative market.

Acknowledgments

References

[1] Guo Yajing. Research on the development of Shanxi religious tourism cultural and creative products [D]. Liaoning Normal University, 2022.

[2] Li Guo. How to seize the new consumption outlet of museum cultural creativity [N] Worker's Daily, 2023-01-03 (007).

[3] Rigorous, Liu Yanna, Yu Jianhui. Empirical Study on the Factors Affecting the International Competitiveness of China's Particleboard Industry [J]. Journal of Fujian Agricultural and Forestry University, 2011,14 (04): 51-56.

[4] Hao Juan. The integrated development of cultural and creative industries from the perspective of "artificial intelligence+" -- Taking Shandong's cultural and creative industries as an example [J]. Modern Enterprise, 2021 (12): 150-151.