Research and Evaluation on Innovation and Development of Business Operation Model from the Perspective of Cultural and Tourism Integration by Big Data Analysis

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Abstract: In order to explore the impact of cultural, tourism, and operational model innovations on the revenue effects of tourism brick-and-mortar stores in the west of China, we conducted a survey of aboriginal residents and tourists in the tourist area of Kashgar Old Town. The investigation lasted for 7 months, a total of 210 days, and 528 valid questionnaires were recovered. Eviews 12.0 software was used to sort and analyze the collected first-hand data. The results show that improving the cultural experience of tourists and the attractiveness of innovative operation models have a significant impact on the average income of brick-and-mortar stores. Improving consumer satisfaction can stimulate consumption behavior in the short term, and improving tourism perception has no significant impact on income.

Keywords: integration of culture and tourism, operation mode, the Belt and Road, the ancient city of Kashgar

1. Introduction

1.1. Research background

The research perspective of cultural and tourism integration is concentrated in the eastern and southern coastal areas of China, which are rich in tourism resources. However, it is necessary to shift the research perspective to Kashgar, as it is the core city of the "Belt and Road". Taking the tourism resources of the ancient city of Kashgar as the research object, we explore the relationship between culture, tourism, and operation that restricts the development of the western tourism economy. The research results will help local governments, institutions of higher learning, tourism resource development, and other institutions to innovate the integrated development model of culture and tourism, improve the training quality of cultural and tourism talents, and promote tourism resource development and economic construction.

1.2. Literature review

The research on the integrated development of culture and tourism originated from scholars' discussion on the relationship between culture and tourism. From the initial basic judgment of "cultural attributes of tourism" to the "soul carrier theory" [1]. In 2018, based on the perspective of identity, Zhang [2] innovatively proposed that the origin of the relationship between tourism and culture is the search for the cultural identity of individual tourists or the collective of nations and countries. Chen and Li [3] proposed that social space production is the basis for the coordinated development of culture and tourism. The World Tourism Organization pointed out in the book Tourism and Culture Synergies published in 2018 that one of the basic drivers of the integration of culture and tourism is the development of education. In addition, another important driving force for the integration of culture and tourism is the synergy between the cultural industry and the tourism industry. Chai believed that culture, as a competitive resource for regional development, helps enhance the creativity of the region and accelerate the urbanization process. Alberti and Giusti stated that cultural industry clusters and tourism industry clusters based on cultural heritage are important elements to enhance regional

competitiveness. Fernandes pointed out that cultural creativity plays the role of an accelerator, innovation source, and driving force in the transformation and upgrading of the tourism industry. It can shape tourism brands, enhance tourism value, promote tourism market innovation, and accelerate the industrial integration of culture and tourism. Wang [4] pointed out that cultural and creative tourism is conducive to interpreting the characteristics of cities, changing the face of thousands of cities, and enriching the level of tourism product carriers. Li and others concluded that diversity, entertainment, symbolism, practicality, and virtuality are the development trends of cultural and creative tourism in the future. The research of Lane and Fatimah jointly pointed out that the integration of culture and tourism promotes the protection of traditional culture. Zhang and Zheng [5] summarized the international trend of the relationship between the protection and utilization of cultural heritage from the perspective of changes in international regulations on cultural heritage over the past century and pointed out that the development of tourism has become an important way to protect and utilize cultural heritage. Li and others [6] pointed out that the development of cultural tourism should not only be "success" but also "innovate", which is an important carrier for the inheritance and dissemination of excellent culture and cultural creation. Canavan proposed that the "host-guest interaction" of tourist destinations promotes cultural exchange and dissemination. Cheer et al. pointed out that on the one hand, traditional culture is more and more attractive to tourists, and on the other hand, the accelerated commercialization process in tourism development may bring adverse effects on culture. Bond et al. pointed out that the increasing demand for cultural tourism is one of the important driving factors for the interaction and integration of cultural industry and tourism. Scholars such as Poria, Butler, and Airey have carried out research on cultural tourists mainly from the perspectives of cultural motivation, cultural perception, and cultural experience. Different tourists have different personal characteristics, consciousness perceptions, and behaviors. There is a special connection between tourists' cultural perceptions and cultural heritage attributes. Individuals' cultural perceptions of heritage sites have a strong relationship with their visiting patterns. Chambers pointed out that among the types of tourism product experience, cultural experience is increasingly favored by tourists, so how to provide a deeper and broader cultural experience in cultural tourism destinations has become a topic that needs to be discussed in depth. In short, the research on the integration of culture and tourism presents prominent characteristics of the times and Chinese characteristics, the academic rationality of the research on the integration of culture and tourism is gradually strengthened, and the empirical orientation of the research method of the integration of culture and tourism is more distinct.

2. Study Design

2.1. Data sources

From November 2021 to May 2022, the research team conducted a field investigation of the ancient city of Kashgar for 7 consecutive months, and randomly selected 6 physical stores as samples in the east, west, and south of the ancient city of Kashgar. According to the optimization of the research team, 528 valid data were collected for subject analysis and further research through on-site observation, interviews, and surveys with foreign tourists and residents. Table 1 shows the survey result.

Table 1: Statistical table of factors influencing the innovation effect of cultural and tourism integration operation model

Cycle(15 days)	Average income (ten thousand yuan)	Cultural experience (%)	Tourism perception (%)	Model innovation attractiveness (%)	Consumer Satisfaction (%)
1	0.89	88	65	84	85
2	0.87	87	67	83	87
3	0.83	88	68	82	83
4	0.84	89	65	80	82
5	0.89	88	62	83	83
6	0.87	87	62	83	84
7	0.88	84	63	86	82
8	0.85	88	64	84	82
9	0.84	85	66	83	84
10	0.83	84	65	84	85
11	0.88	87	68	86	86
12	0.91	86	69	88	88
13	0.88	87	70	85	89
14	0.84	84	71	83	91

2.2. Selection of variables

We selected the average income of 6 brick-and-mortar stores per half-month as the main explanatory variable. At the same time, according to the average value of the scores of tourists participating in the survey, cultural experience coefficient, tourism perception coefficient, model innovation attractiveness coefficient, and consumer satisfaction are selected as explanatory variables. A multiple regression evaluation model was constructed for culture, tourism, and model innovation. It is used to evaluate the application effect of operating model innovation.

2.3. Model Design

Let Y_i be the average income of 6 brick-and-mortar stores per half-month, X_{1i} is the tourist cultural experience coefficient, X_{2i} is the tourist tourism perception coefficient, X_{3i} is the model innovation attractiveness coefficient, and X_{4i} is the consumer satisfaction. β_0, β_1, β_2, β_3, and β_4 are parameters, and μ_i is a random disturbance term. The initial multiple regression model is established. Considering that the model has not yet undergone parameter estimation and model testing, there may be an adjustment of explanatory variables. For this reason, we call Eq. (1) the initial model.

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \mu_i \tag{1}$$

3. Metrological Inspection and Result Analysis

3.1. Model estimation results and analysis

Table 2 shows that tourists' cultural experience, the attractiveness of model innovation, and consumer satisfaction have a significant impact on the average revenue of brick-and-mortar stores, while tourists' perception of tourism has no significant effect on the average revenue of brick-and-mortar stores. The results may have multicollinearity among the variables. Therefore, it is necessary to use the method of stepwise regression analysis to test the possible multicollinearity among explanatory variables and to eliminate and replace relevant variables according to the economic significance of each explanatory variable.

Table 2: Estimated output results of the initial model of formula (1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.938516	0.333114	-2.817407	0.0201
X_{1i}	0.008892	0.002384	3.730008	0.0047
X_{2i}	-0.006259	0.00214	-2.924705	0.0169
X_{3i}	0.010764	0.002024	5.317637	0.0005
X_{4i}	0.006394	0.002327	2.747912	0.0226

3.2. Stepwise regression analysis

The test results of the initial model (Eq. (1)) fully demonstrate that tourists' perception of tourism has no significant effect on the average revenue of brick-and-mortar stores. Comprehensive consideration, usually high tourist satisfaction, good tourism perception, poor tourism perception, and low tourist satisfaction may have multicollinearity. Therefore, elimination was carried out to establish model (Eq. (2)) for quadratic regression analysis.

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \mu_i \tag{2}$$

Using the same analysis method as the initial model (Eq. (1), the quadratic regression analysis results were obtained, as shown in Table 3.

Table 3: Initial model estimation output of formula (2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.815749	0.437828	-1.863173	0.092
X_{1i}	0.007816	0.003121	2.504627	0.0312
X_{3i}	0.011019	0.002679	4.112238	0.0021
X_{4i}	0.000934	0.00184	0.507439	0.6228

After excluding the explanatory variables of tourists' perception of tourism, the effect of tourists'

cultural experience and model innovation attractiveness on the average income of physical stores is still significant, while the effect of consumer satisfaction on the average income of physical stores is not significant. Therefore, it is necessary to eliminate consumer satisfaction and take further revisions to the model.

3.3. Revised model

Considering the results of the quadratic regression analysis comprehensively, a model (Eq. (3)) is established for the regression analysis.

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_3 X_{3i} + \mu_i \tag{3}$$

Taking the same analysis method as the initial models (Eqs. (1) and (2)), the third regression analysis results were obtained as shown in Table 4.

Table 4: Estimated output results of the initial model of formula (3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.725631	0.386449	-1.877687	0.0872
X1i	0.007392	0.002904	2.545901	0.0272
X3i	0.011328	0.002519	4.496518	0.0009

The cultural experience of tourists and the attractiveness of model innovation have a significant impact on the average income of brick-and-mortar stores. So get the regression result of the model.

$$Y_i = -0.725631 + 0.007392 X_{1i} + 0.011328 X_{3i} \tag{4}$$

The results imply that the effect of the average income of brick-and-mortar stores is positively correlated with the perception of tourists' cultural experience and the attractiveness of model innovation, and the proportional relationship is the same as that in the model. The economic significance is consistent with the theory, indicating that the revised model has goodness of fit. The constant term and the t-test value of each explanatory variable also passed without multicollinearity.

3.4. Model checking

3.4.1. Goodness of fit test

$$\overline{R}^2 = 1 - \frac{RSS/(n-k-1)}{TSS/(n-1)} \tag{5}$$

We applied the Eviews10.0 operation to obtain the results. The absolute coefficient $R^2 = 0.655743$, and the adjusted absolute coefficient $R^2 = 0.593151$, indicating that the sample regression equation fits the observed values of the sample well, and the explanatory variables have a positive effect on the evaluation of the average income of physical stores. The explanatory power is 65.57%, which shows that the modified model has a better fitting effect.

3.4.2. Overall significance test

The null hypothesis and alternative hypothesis are proposed as follows. H0:$\beta_0 = \beta_1 = \ldots = \beta_k = 0$, H1: β_j is not 0. F=10.47643 has been obtained, given $\alpha = 0.1$, the degree of freedom k-1=2 and n-k=11 obtained by looking up the table are $F\alpha$ (2, 11) =7.2. Because F>$F\alpha$ (2, 11), it can be fully explained, at a significance level of 0.1, the model rejects the null hypothesis that the population is not significant. Therefore, the model is overall significant.
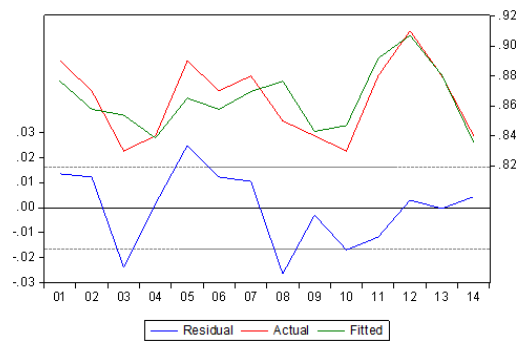
3.4.3. Model Fitting Regression

Figure 1: Plot of fitted values.

Comparing the fitted curve and the Actual curve, it is observed that the multivariate linear model fitting effect of the factors affecting the average income effect of physical stores is better (Fig. 1).

4. Conclusions and Recommendations

528 valid data were obtained through field observation of the research objects for 210 consecutive days. By using multiple regression model analysis methods, a step-by-step regression analysis is carried out on the influencing factors that affect the average income effect of physical stores. A regression model is established with factors affecting the average income of brick-and-mortar stores in terms of culture, tourism, and model innovation. Through research, we found that simply improving tourists' perception of tourism cannot effectively increase the average revenue of brick-and-mortar stores. Although improving consumer satisfaction increases revenue in the short term, the one-time consumption attribute of tourists cannot support the continuous increase of brick-and-mortar store revenue. On the contrary, through the innovation of the operation model, the experience perception of cultural elements can be improved, which helps the physical store to increase its income for a long time.

Acknowledgment

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