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Impact of Accessibility and Network Attention Coupling Coordination on Operating Benefits of Scenic Spots

-- Empirical Research based on BP Neural Network

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Abstract: This paper takes the scenic spots in the outskirts of Beijing as the research area and uses a BP neural network model based on the perspective of coupling relationship to study the impact of accessibility, network attention, and their coupled coordination relationship on operational efficiency of scenic spots in the outskirts of Beijing between November 27, 2018 and January 20, 2020. The results show that the coupled coordination relationship between accessibility and network attention has a significant positive impact on operational efficiency. Under the situation of coupled coordination, there is a positive impact between accessibility and operational efficiency as well as between network attention and operational efficiency; however, under the situation of mismatching, there is a negative non-linear relationship between accessibility and operational efficiency, and between network attention and operational efficiency, respectively.

Keywords: Accessibility; Network Attention; Tourist Attractions; Operational Benefits.

1. Introduction

As people's living standards continue to improve, tourism has become one of the important ways of life. The rapid development of tourism has brought about a serious problem of disconnect between tourism demand and tourism resources, which greatly affects the operational efficiency of scenic spots. The accessibility of tourist resources in scenic spots is a prerequisite for tourists to travel and an important feature of scenic spots. At the same time, under the background of the rapid development of internet technology, a large amount of data related to tourism has explosively increased, greatly affecting the way in which travel information is collected and decision-making results. Therefore, the study of the coupling coordination relationship between the accessibility of scenic spots and the network attention has far-reaching significance, which can promote the harmonious and healthy development of the operational efficiency of scenic spots.

With the development of the internet, network search has become a common method for people to understand related demand information and provide references for decision-making. In the tourism industry, the data generated by network searches has also shown an "explosive" growth. Increasing numbers of scholars are using network data mining technology to study the network attention of tourism. Currently, research on tourism network attention mainly focuses on the spatiotemporal distribution characteristics of tourism network attention, the relationship between network attention and scenic spot tourist flow, and the function of network search data in predicting tourism tourist flow. Accessibility studies in China can be traced back to the 1990s, and in recent years, some scholars have introduced it into relevant tourism research, which has developed rapidly [1]. The results mainly focus on the factors influencing scenic spot accessibility and accessibility level evaluation, the structure of scenic spots based on accessibility, and the study of accessibility and tourism efficiency. There is a coordinated and common development relationship between the accessibility of scenic spots and the network attention, but currently, there is little research on the coupling coordination relationship between the two systems, nor has its impact on operational efficiency been explored.

Therefore, this paper conducts statistical analysis of relevant data of scenic spots in the outskirts of Beijing from November 27, 2018 to January 20, 2020 through network data mining. An evaluation system for the accessibility, network attention, and operational efficiency of scenic spots in the outskirts of Beijing during this period is established. A BP neural network model is constructed to analyze the impact of accessibility, network attention, and their coupled coordination relationship on operational efficiency, providing theoretical guidance for improving the operational efficiency of scenic spots.

2. Study Area and Methods

2.1. Study Area and Data

Beijing's outskirts are located in the northwest and northeast areas of Beijing. Generally, they are mountainous areas and mountain front zones between mountains and plains with numerous ecological resources, as well as customs and cultural relics. Typical cultural scenic spots include ancient ruins and temples such as Hongluo Temple, Badaling, and Simatai Great Wall. Similarly, the natural landscape is also beautiful and colorful with mountain, forest, and water scenery such as Jingdong Grand Canyon, Jinshang Lake, Qinglong Gorge, Heilongtan, and Songshan Nature Reserve. In this paper, Beijing's outskirts are selected as the research area. According to the list of key scenic spots (4A and above) real-time tourist flow data released on July 22, 2021, by the Beijing Municipal Administration of Culture and Tourism on the Beijing Municipal Public Data Open Platform, 19 key scenic spots in Beijing's outskirts are selected, including two 5A scenic spots and seventeen 4A scenic spots. As the World Grape Expo Park has not yet created a Baidu search index, this tourist attraction is excluded from this study, and only the remaining 18 tourist attractions are analyzed.

The main data used in this paper include geographic

information data, scenic spot tourist flow data, tourism website rating data, and Baidu index data. The geographic information data are obtained from Baidu Maps. The researchers use Python to crawl and splice Baidu Map tiles to obtain the main road network of Beijing under 13-level view and obtain the coordinates of 18 tourist attractions through the Baidu Map API, which is used as the basic data for analyzing accessibility. The scenic spot tourist flow data are obtained from the historical data set of real-time tourist flow data of key (4A or above) scenic spots published by the Beijing Municipal Administration of Culture and Tourism, with a time range from November 27, 2018, to January 20, 2020, covering 19 tourist attractions. Due to the outbreak of COVID-19 in 2020, tourist flows sharply decreased, so abnormal data after 2020 were not considered. The tourism website rating data are selected from the ratings of the target scenic spots from November 27, 2018, to January 20, 2020, on Ctrip. The network attention data are obtained from Baidu index. The names of the scenic spots, scenic spot attractions, and tourism guides of the scenic spots are selected as search keywords. The daily network attention of each scenic spot's collected keywords from November 27, 2018, to January 20, 2020, is used as the basic data for the synthetic indicator of the network attention of each scenic spot.

2.2. Research Method

2.2.1. Online Attention

Tourism online attention can be defined as the degree to which a tourist event or scenic spot receives attention from tourism consumers in the network. Specifically, it is demonstrated by tourists using various search engines, clients, or social media platforms to search for a certain tourism keyword. By quantitatively analyzing the search frequency of related keywords, tourism online attention can be measured [2].

First, using the direct word-taking method, effective keywords that represent scenic spots were selected based on the Baidu Index platform. The contribution weights of each keyword to the comprehensive attention of the scenic spot were determined by using principal components analysis (PCA) method, and the comprehensive online attention of the scenic spot was synthesized.

The specific calculation process of the comprehensive online attention of a certain tourist scenic spot is as follows:

Assume that a certain tourist scenic spot includes n keywords, and the respective online attention values are a1, a2, ..., an, then the original data vector can be obtained as shown in formula (1).

$$I = (I_1, I_2, \cdots, I_q) \tag{1}$$

The linear combination of the original variables yields formula (2).

$$C_f = a_{1f}I_1 + a_{2f}I_2 + \cdots + a_{qf}I_q, f = 1,2,\cdots,q \tag{2}$$

Where the linear combination coefficient satisfies formula (3).

$$a_{1f}^2 + a_{2f}^2 + \cdots + a_{qf}^2 = 1 \tag{3}$$

At this time, the principal components of the online attention of a certain tourist scenic spot are obtained by sorting in ascending order. $cov(C_i, C_j) = 0, (i \neq j, i, j = 1,2,\cdots,q)$

The comprehensive online attention of a certain tourist scenic spot is determined by weighted average principal component, as shown in formula (4).

$$W = \frac{\sum \lambda_i C_i}{\sum \lambda_i} \tag{4}$$

Where λi represents the eigenvalue of each principal component.

2.2.2. Accessibility

The concept of "accessibility" was initially proposed by Hansen W in the field of urban traffic planning to describe the relative proximity or separation between a place and other surrounding places, thereby reflecting the degree of difficulty in meeting people's needs for certain activities in that place [3]. Based on the line segment model established on the basis of road centerlines, which greatly reduces modeling errors and is easy to understand compared with manually established axis line models, this article uses the sDNA plug-in of ArcGIS Toolbox to calculate the relevant parameter indicators based on the spatial syntax theory for accessibility analysis of scenic spots in the outskirts of Beijing.

2.2.3. Coupling Coordination Model

The inherent relationships between elements within the system or between the system and other systems can be studied through coupling relationships. This paper analyzes the coupling degree based on the coupling coefficient model, and the calculation formula of the coupling degree is shown in formula (5).

$$C = \frac{\sqrt{u_1 u_2}}{|u_1 + u_2|} \tag{5}$$

The coupling coordination degree represents the coupling coordination degree between the elements of the tourism scenic spot online attention and accessibility subsystems, and its value ranges from 0 to 1. The calculation formula is shown in formula (6).

$$D = \sqrt{CT} \tag{6}$$

The comprehensive coordination index represents the overall synergy or contribution of the online attention and accessibility of the tourism scenic spot, with weights of λ and μ, respectively. The calculation formula is shown in formula (7).

$$T = \alpha u_1 + \beta u_2 \tag{7}$$

The higher the coupling coordination degree, the better the mutual promotion effect between the online attention and accessibility subsystems of the tourism scenic spot, and vice versa.

2.2.4. Scenic Spot Benefits

According to the meaning of scenic spot operation efficiency, combined with the results of previous research and the consideration of data availability, this paper evaluates the operation efficiency of scenic spots from two dimensions: passenger flow and satisfaction. Table 1 shows the evaluation indicators of scenic spot operation efficiency.

Table 1. Evaluation index of scenic spot operation benefit

evaluation index	evaluation contents
passenger flow	daily passenger flow of scenic spot
satisfaction	satisfaction of tourists in tourist destinations

In the vast majority of public scenic spots in China, such as national parks, scenic spots, and nature reserves, the purpose of their establishment is to better protect the natural landscapes and cultural heritage that belong to the public and are fragile and scarce, and to allow more people to have the opportunity to appreciate and relax, so as to better meet the

needs of the public for a better life. Although evaluating the operation efficiency of scenic spots poses problems such as multiple objectives, long periods, and difficulties in quantitative assessment, this paper selects result-oriented indicators, namely passenger flow and satisfaction, to evaluate operational efficiency from the perspectives of "quantity" and "quality".

2.2.5. BP Neural Network Model

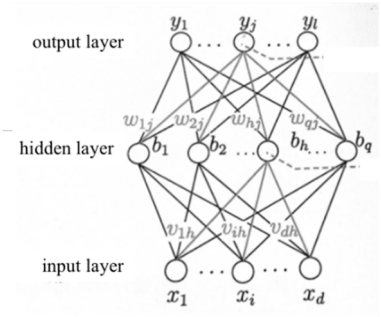


Figure 1. Classic three-layer neural network structure

Table 2. The specific data format

serial number	variable names	types of variables
1	date(x_1)	numerical variable
2	accessibility(x_2)	numerical variable
3	network attention degree(x_3)	numerical variable
4	degree of coupling coordination(x_4)	numerical variable
5	name of scenic spot_Jingdong Grand Canyon(x_5)	categorical variable(0,1)
6	name of scenic spot_Shilin Crayon(x_6)	categorical variable(0,1)
7	name of scenic spot_Shuiguan Great Wall(x_7)	categorical variable(0,1)
8	name of scenic spot_Badaling Great Wall(x_8)	categorical variable(0,1)
9	name of scenic spot_Ya Ji Mountain(x_9)	categorical variable(0,1)
10	name of scenic spot_Yellow Blossoms Great Wall(x_{10})	categorical variable(0,1)
11	name of scenic spot_Simatai Great Wall(x_{11})	categorical variable(0,1)
12	name of scenic spot_Baili Landscape Gallery(x_{12})	categorical variable(0,1)
13	name of scenic spot_Mutianyu Section of the Great Wall(x_{13})	categorical variable(0,1)
14	name of scenic spot_Songshan Forest Tourist Area(x_{14})	categorical variable(0,1)
15	name of scenic spot_Taoyuan Fairy Valley(x_{15})	categorical variable(0,1)
16	name of scenic spot_Hongluo Temple(x_{16})	categorical variable(0,1)
17	name of scenic spot_Wild Duck Lake(x_{17})	categorical variable(0,1)
18	name of scenic spot_Jinhai Lake(x_{18})	categorical variable(0,1)
19	name of scenic spot_Yanxi Lake(x_{19})	categorical variable(0,1)
20	name of scenic spot_Qinglongxia(x_{20})	categorical variable(0,1)
21	name of scenic spot_Black Dragon Pool (x_{21})	categorical variable(0,1)
22	name of scenic spot_Longqing Gorge(x_{22})	categorical variable(0,1)
23	operational benefits(y)	numerical variable

Artificial neural networks (ANNs), also known as neural networks (NNs), are computational models that mimic the structure and function of biological neural networks [4]. The basic structure of artificial neural networks consists of three types of neuron layers. The classic neural network structure consists of three hierarchical layers: the input layer, the hidden layer, and the output layer. The classic three-layer neural network structure is shown in Figure 1. The circles represent neurons, the connecting lines represent weights that process information, and the neurons are connected to each other through the connecting lines to form a network topology [5].

Where N is the number of input layer neurons, M is the number of output layer neurons, and L is the number of hidden layer neurons. θi represents the threshold of the ith output layer neuron, ηj represents the threshold of the jth hidden layer neuron, wij represents the connection weight from the ith input layer neuron to the jth hidden layer neuron, and vjk represents the connection weight from the jth hidden layer neuron to the kth output layer neuron in a single-layer neural network.

3. Data Processing

(1) Data Preprocessing

BP neural network has strong nonlinear mapping ability and can directly train and learn from existing data. Therefore, based on the analysis of accessibility, network attention and coupling coordination, this paper establishes the initial operating efficiency data set about time as features. Since this case aims to explore the impact of the coupling coordination between accessibility and network attention on operating efficiency in scenic spots in the outskirts of Beijing, different scenic spots are used as classification variables to explore the mapping relationship of overall impact. As different scenic spot names belong to unordered multivariate variables, they need to be transformed into dummy variables (virtual variables) when introducing the model. At the same time, the time series of all scenic spots will cause conflicts when added to the model, so the time is transformed into a timestamp and added to the model as a variable. After processing, the dataset includes 7560 data rows and 2 variables (columns). The specific data format is shown in Table 2.

Abnormal points are usually an important source of prediction model errors. For the removal of abnormal points, this paper uses the random forest algorithm for outlier verification in the pycaret library and carries out removal based on the search results. After calculation, there are 378 abnormal data points in the 7560 data rows, so the removal operation does not affect the predictive accuracy and precision of the model. By using a pairwise diagram for non-dummy variables analysis, where CIndex represents comprehensive network attention, Accessibility represents accessibility, D represents coupling coordination, and Ope_benefit represents operational efficiency, it can be found that the relationship between accessibility and operational efficiency is not a simple linear relationship, while both network attention and coupling coordination have strong linear relationships with operational efficiency. Identify the abnormal values recognized by the random forest algorithm, and the results of anomaly detection are shown in Figure 2, where the Anomaly value of 0 represents normal and the value of 1 represents abnormal. After removing the abnormal values, the remaining 7182 data points are continued to be calculated.

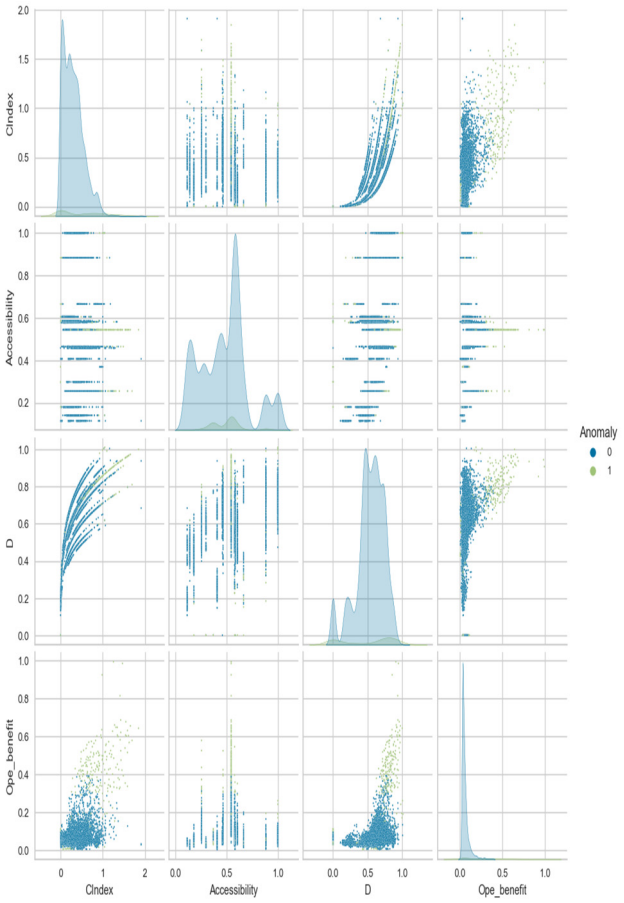


Figure 2. The results of anomaly detection

(2) Data Normalization

Since the dimensions of the data are inconsistent, it is necessary to normalize the data before inputting it into the model for training in order to improve operational efficiency and precision. This paper adopts the minimum-maximum normalization.

(3) Dataset Division

In machine learning algorithms, the original dataset is usually divided into three parts: training set, validation set, and test set, which are used for model training, model selection, and model evaluation, respectively. This paper uses the train_test_split function from sklearn. model_selection to first divide the dataset into a training set and a validation set, with the number of training sets set to 90% of the entire dataset. Since the model construction process also needs to verify the model configuration and determine whether the training degree is overfitting or underfitting, this paper divides the training data into two parts, with 90% of the training set used for training and the remaining 10% used for verification.

4. Model Establishment

(1) BP Neural network model parameter determination

In this paper, the BP neural network regression model is built using the open-source artificial neural network library Keras written in Python. As analyzed in the previous section, a single-hidden-layer BP network is adopted, which includes only one input layer, one hidden layer, and one output layer. Based on the dimension of the dataset, the input layer contains 22 neurons, and the output layer contains 1 neuron. The activation function from the input layer to the hidden layer

and from the hidden layer to the output layer is set to Sigmoid, the loss function is set to mean squared error, and the model optimizer is set to stochastic gradient descent (SGD).

Then, the keras tuner automatic tuning tool is used to find the number of hidden layer neurons and learning rate that are close to optimal. According to the previous analysis, continuous integers are selected as the search space for the number of hidden layer neurons (units), and a set is selected as the search space for the learning rate (learning_rate). In order to improve training efficiency, the tolerance of the loss function is set to 10 as the early stopping criteria. A search is conducted on all 135 possible combinations, with a maximum training epoch of 400 and a batch size of 16. After the search, the optimal number of hidden layer neurons and learning rate are 10 and 0.1, respectively.

The optimal parameters obtained from the search are added to the model for training. The convergence graph of the loss function after training is shown in Figure 3. From the graph, it can be seen that the loss function values for the training set and test set become stable at about 200 epochs, indicating that the function has converged. The loss value is about 0.0013, which meets the accuracy requirement of an error value less than 0.1.

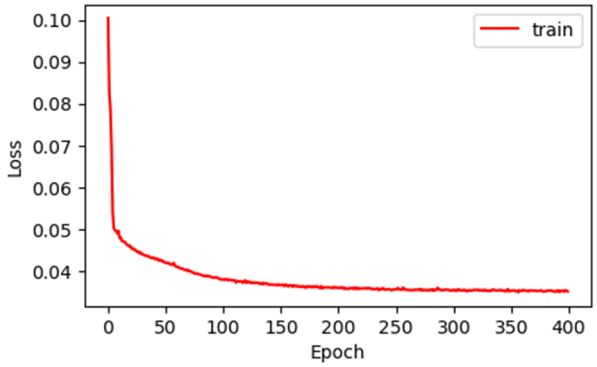


Figure 3. The Convergence Graph of the Loss Function After Training

(2) BP Neural network model prediction

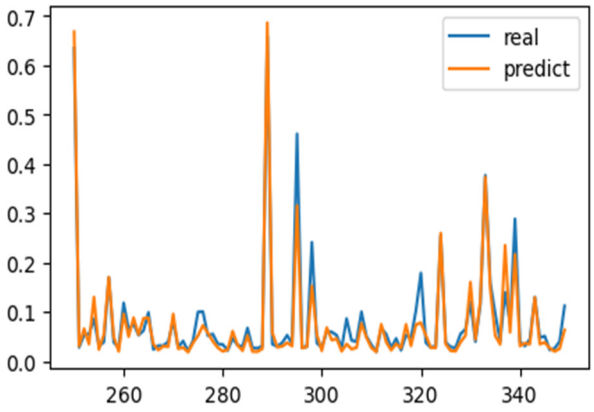


Figure 4. Operating efficiency prediction results of scenic spots (a part)

The model is used to predict the operating efficiency of scenic spots on the test set. Due to the large amount of test data, to display the prediction results more clearly, the data from the 250th to 400th point are selected for plotting the operating efficiency prediction results (a part), shown in Figure 4. From the figure, it can be seen that the prediction effect of the model is good, with predicted values and actual values being almost the same. However, for holidays with a significant increase in passenger flow, due to their susceptibility to various unpredictable factors and strong nonlinear features, the prediction accuracy of the operating efficiency of scenic spots is not high. After evaluating the model, the calculated prediction accuracy is 87.37%, indicating that the model has good prediction performance.

5. Results Analysis

(1) Hypothesis Testing and BP Model Results Analysis

Using the BP neural network model established for the accessibility, network attention, and the synergy coupling coordination and operational benefits between the two, the impact of accessibility, network attention, and the synergy coupling coordination on operational benefits was further studied. By inputting the virtual changes in the three indicators of accessibility, network attention, and coupling coordination, the changes in output operational benefit data were calculated and analyzed. This article takes Longqing Gorge and Badaling Great Wall as representatives to study the impact of accessibility, network attention, and the synergy coupling coordination between the two on operational benefits under couplings imbalance and coordination situations, respectively.

1) The Impact of Accessibility on Operational Benefits

With the variables of network attention and coupling coordination kept constant, i.e., taking the average value of both, accessibility was adjusted from 0.1 to 5 times, and the relationship curve between accessibility and operational benefits could be fitted. The relationship between accessibility and operational benefits is shown in Figure 5.

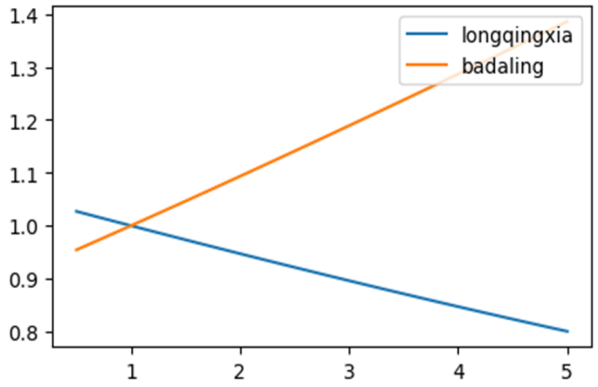


Figure 5. Relationship between Accessibility and Operational Benefits

For Longqing Gorge with coupling imbalance, the improvement of accessibility has a negative impact on operational benefits, indicating that in the case of good accessibility and coupling imbalance, the unilateral improvement of accessibility does not contribute to operational benefits, and even after investing time, money and resources to improve accessibility, the operational benefits of the scenic area further decrease. For example, in 2015, the renovation of the old Yankou Road in Yanqing provided a new choice for citizens to reach Longqing Gorge by car. However, through network travel text analysis, it was found that due to the bad travel experience brought to tourists during road construction, and the fact that the scenic area did not issue a clear notice after the road construction was completed, the operational benefits of the scenic area dropped significantly during a certain period after the road renovation. In the case of coupling coordination, the improvement of accessibility

has a significant positive impact on the operational benefits of Badaling Great Wall. Badaling Great Wall has good accessibility and excellent network attention. After the opening of the Badaling Great Wall high-speed rail station of the Beijing-Zhangjiakou Railway at the end of 2019, the tourist flow of Badaling Great Wall has increased compared with the same period of previous years, and according to travel comments and ratings, many tourists are highly satisfied with their travel experience due to the impact of the high-speed rail. Therefore, Hypothesis 1 is verified.

2) The Impact of Network Attention on Operational Benefits

With the variables of accessibility and coupling coordination kept constant, i.e., taking the average value of both, the relationship curve between network attention and operational benefits could be fitted by adjusting the network attention by percentage. The relationship between network attention and operational benefits is shown in Figure 6.

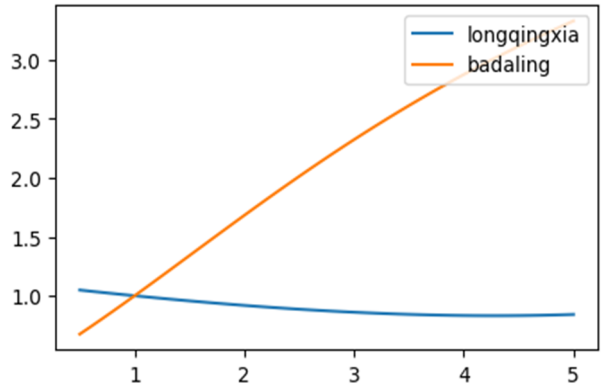


Figure 6. Relationship between Network Attention and Operational Benefits

For Longqing Gorge with coupling imbalance, the relationship curve between network attention and operational benefits shows that network attention has an impact on operational benefits, but it is not a simple positive or negative impact. Whenever the online attention to Longqing Gorge reaches its peak during the ice lantern festival preheating and opening period, the actual tourist flow will also experience a small wave crest. At the same time, due to the widespread promotion of the ice lantern festival online, many tourists have high expectations for the scenic area, but the on-site tourism experience is quite different, resulting in a low satisfaction rating during this period. Therefore, during this period, the scenic area does not necessarily achieve better operational benefits. For Badaling Great Wall with coupling coordination, the improvement in network attention has a significant positive impact on the operational benefits of the scenic area. Badaling Great Wall is well-known and is already a very mature tourist attraction. The scenic area further enhances its network attention by holding thematic activities or hosting related events, generating more benefits for the scenic area. Therefore, Hypothesis 2 is verified.

3) The Impact of Coupling Coordination of Accessibility and Network Attention on Operational Benefits

With the variables of accessibility and network attention kept constant, i.e., taking the average value of both, the relationship curve between coupling coordination and operational benefits could be fitted. The relationship between coupling coordination of accessibility and network attention and operational benefits is shown in Figure 7.

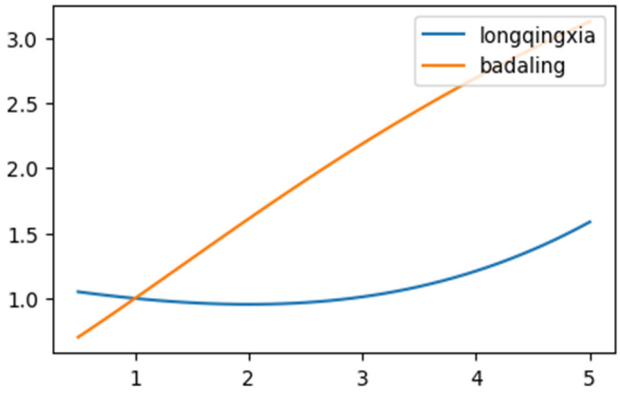


Figure 7. Relationship between Coupling Coordination of Accessibility and Network Attention and Operational Benefits

Regardless of whether the scenic area is in the case of coupling imbalance or coordination, the coupling coordination of the scenic area has a significant positive impact on operational benefits, and the operational benefits of the scenic area with coupling imbalance are more sensitive to the improvement of coupling coordination.

(2) Suggestions

Based on the analysis of the impact of accessibility and online attention on the operating performance of scenic spots in the suburbs of Beijing and their coupling coordination relationship, as well as the existing problems, the following suggestions are proposed for the development of scenic spots in the suburbs of Beijing:

1) Strengthen transportation construction, connect the inside and outside of scenic spots as well as between scenic spots, and further enhance the radiation and driving effect of high-quality scenic spots.

Through the analysis of global syntactic integration, most scenic spots in the suburbs of Beijing are located at the northern end of the north-south expressway, with poor global integration and lack of high-level road connections between scenic spots and inside scenic spots. Investigation shows that the poor accessibility of these scenic spots is mainly due to geological conditions and traffic location. It is suggested to strengthen the east-west transportation construction outside and between scenic spots, and enhance the connection between the internal and external roads of scenic spots, add more sign boards along the way to guide tourists into the scenic spots quickly, and reduce the overall integration of scenic spots as much as possible to improve their accessibility. For high-quality scenic spots with higher operating efficiency, road network structure planning for nearby scenic spots should be integrated to promote good radiation and penetration to surrounding scenic spots. For example, the best operating efficiency of Badaling Great Wall is located at exit 58 of G6 Jingzang Expressway's northwest in Yanqing District, and there are many A-class scenic spots such as Shuiguan Great Wall, Yeyahu Lake and Shanshui Baili Gallery in the surrounding area. Yanqing District can fully leverage the radiation and driving effect of its 5A-class scenic spots, establish a short-distance road network directly connected with the surrounding scenic spots, integrate the cluster effect of its scenic spots in the southeast, and improve the efficiency of scenic spots in the whole district.

2) Pay attention to Internet media, actively strengthen the construction and promotion of scenic spot brands.

The arrival of the Internet era has generated a large amount of data information, which affects the results of people's travel

decisions and changes the traditional way of tourism promotion. Various self-media platforms and professional platforms in the tourism industry have become important platforms for tourism brand building and development, such as WeChat public account, Weibo, Little Red Book, Douyin, and Ctrip. At present, key scenic spots in the suburbs of Beijing all have corresponding self-media platforms, but only a few of them perform actively on the Internet. Therefore, all scenic spots should pay attention to various self-media platforms and professional platforms in the tourism industry, utilize their own resource features and advantages, launch high-quality promotional content, and attract internet tourists to pay attention. At the same time, the Internet is also filled with the most truthful voices of tourists. Scenic spots can use these data, combine their own tourism resources' traits and functionality, focus on tourists' real psychology and practical needs, continually optimize scenic spot services, and provide personalized tourism products.

3) Refine the development mode of various scenic spots, promote the coordinated development of accessibility and online attention for scenic spots.

For scenic spots with high accessibility and high online attention, we should focus on giving full play to their leading and demonstrative effects, expand the accessibility of road networks through the construction of high-level traffic routes, and take advantage of their "net red" features, jointly develop and create characteristic tourism products with surrounding scenic spots to drive the overall development of the area.

For scenic spots with high accessibility but low online attention, their advantage of high accessibility should continue to be utilized. Develop and integrate resources with surrounding scenic spots, improve infrastructure, and drive tourism development with transportation advantages. At the same time, deepen the Internet marketing, increase online promotion efforts for scenic spots, improve their visibility, and increase tourism attractiveness.

For scenic spots with low accessibility but high online attention, we should focus on their advantage of online attention, and achieve the driving effect on the accessibility system. By constructing high-level and interconnected roads between other scenic spots, connect them into the core road network, and incorporate them into the synchronous construction mode from points to lines to surfaces of the area.

For scenic spots with low accessibility and low online attention, priority should be given to developing Internet marketing, while accelerating the improvement of road networks and infrastructure. Develop regionalized and path-dependent feature-based development routes to enhance the visibility of scenic spots.

References

[1] Zeng, C. (2016). From "Isolated Island" to City: Spatial design strategy under the background of architectural urbanization. Beauty and Time: Cities, (5), 23-24.

[2] Li, X. (2018). Analysis of network attention degree and SVR passenger flow prediction in Jiuzhaigou. Nanchang University.

[3] Zhang, Y. (2012). Graph theory Reachability. Chinese Journal of Architecture, (09), 71-76.

[4] Yegnanarayana, B. (2009). Artificial neural networks. PHI Learning Pvt. Ltd.

[5] Abraham, A. (2005). Artificial neural networks. Handbook of measuring system design.