Exploring Innovative Approaches to Regional Tourism Service Models in the Context of Internet Plus

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Abstract: The Internet Plus era has profoundly impacted tourism, yet many regional businesses still use traditional models, causing issues like low digitization. To explore innovation paths, this study first analyzes the Internet Plus era's characteristics and influence on tourism, highlighting traditional models' limitations. Then, based on user big data, a new service model is proposed, enabling personalized services through data analysis. An evaluation system and verification method assess the model's effectiveness in improving user satisfaction and sales. This research provides theoretical guidance for regional tourism businesses to adapt in the Internet Plus era and a framework reference for future research. Diverse user needs require consideration in applications.

Keywords: Internet Plus; regional tourism; service models; innovative paths

1 Introduction

As China undergoes economic transformation, the digitization and intelligence of the tourism industry is rapidly developing under Internet Plus. However, many regional tourism enterprises still utilize traditional service models, facing issues in experience and efficiency. To embrace these trends, mindset shifts alongside exploration of innovative data-driven models tailored to the internet era are critical. This study focuses on service model innovation leveraging technologies like big data to provide personalized, differentiated services based on precise user profiles and behavior. Constructing and testing these user-centric models can ultimately enhance experiences and business efficiency[1]. The research aims to provide theoretical and practical guidance for regional tourism enterprises undertaking digital transformation in the Internet Plus context to better meet modern demands.

2 Analysis of the Impact of Internet Plus on Regional Tourism Services

2.1 Analysis of the Internet Plus Era Background

The arrival of the Internet Plus era presents unprecedented opportunities for the tourism industry. Since the 1990s, network technology has rapidly advanced, and the widespread adoption of mobile communication technology has led to the rapid proliferation of smartphones, tablets, and other mobile devices. The robust network infrastructure has facilitated deep integration of information technology with various aspects of the economy and

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society. Information and communication technologies, led by the internet, are ushering society into the "Internet Plus" era. Specifically, in China, the internet penetration rate has reached 54.3%, with a user base of 854 million internet users and 817 million mobile internet users (see Table 1)[2]. This provides a vast online space and a large potential user base for the tourism industry. Tourism enterprises can promote their products efficiently through the internet, achieve precise matching with users, and significantly enhance their marketing efficiency.

Table 1: Scale of Internet Development in China

Year	Internet Penetration Rate	Internet User Scale (Millions)	Mobile Internet Users (Millions)
2015	50.30%	688	557
2016	53.20%	731	695
2017	54.30%	772	753

2.2 Impact of Internet Plus on the Tourism Industry

Internet Plus has profoundly transformed the tourism industry by enabling a shift towards meeting personalized user demands through data-driven insight. Tourism enterprises have evolved from information providers to precise user profile analysts, offering customized services. Mobile internet also eliminates spatiotemporal constraints, facilitating omni-channel marketing via apps and mini-programs to achieve online-offline integration. Furthermore, new technologies like virtual and augmented reality are creating immersive, smart tourism experiences from guided tours to hotels. By digitizing, enhancing intelligence and facilitating in-depth integration, Internet Plus increases tourism product value[3]. It has changed mindsets, models and products to be more user-centric, innovative and experience-driven to meet modern travelers' needs.

2.3 Analysis of the Current Status of Regional Tourism Services Based on Big Data

The use of big data technology allows for a more accurate understanding of the current status of regional tourism development. Data sources encompass not only government statistics and third-party user survey reports but also diverse data channels, including databases from tourism enterprises. These data need to undergo cleaning and integration to build a comprehensive regional tourism big data platform. Key indicators cover various aspects such as the growth rate of inbound tourists, their distribution by source, and the scale of online travel transactions (see Figure 1). Statistical analysis shows that the number of tourists in the XYZ region has maintained a high growth rate in recent years, with a significant increase in the penetration rate of online bookings. More and more consumers rely on mobile internet to book travel services. However, there exists an imbalance in the development of the tourism industry among different cities within the region. For example, City A significantly outperforms others in the tourism industry due to its resource advantages. The analysis of these data provides essential data support for the design of tourism products and the formulation of marketing strategies within the region [4].

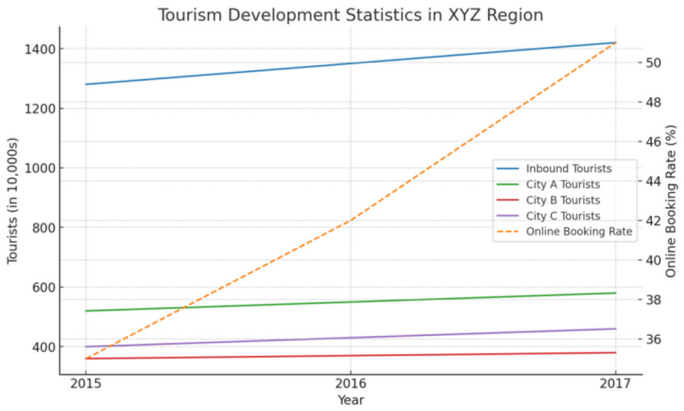

Figure 1: Key Data Indicators for the Tourism Industry in the XYZ Region

3 Establishment of Innovative Regional Tourism Service Models

3.1 Limitations of Traditional Service Models

Traditional regional tourism service models face major limitations in adapting to the internet era. Relying on physical storefronts and manual processes, they lack efficiency and precision in areas like marketing, reservations, and maintaining consistent service standards. Printed promotions have simplistic reach while in-person inquiries and purchases are time-consuming. With tourists increasingly expecting online convenience and seamless user experiences bridging online and offline channels, the disconnect hinders enterprises[5]. Ultimately, failing to leverage internet technologies significantly impedes their competitiveness, growth and development. Overcoming these pitfalls is essential for progress, necessitating optimized internet-enabled service models.

3.2 Construction of Innovative Service Models

To address the limitations of traditional models, innovative service models for the Internet Plus era can be established. This model involves the creation of a tourism big data platform for the collection, analysis, and application of user behavior data. Specifically, the data platform includes user attribute data, browsing trajectory data, service evaluation data, and more (see Table 2).

Table 2: Framework of Tourism Big Data Platform

Module	Data Types
User Profiles	Attribute Labels, Spending Levels
User Behavior	Browsing Records, Click Behaviors
Service Reviews	Textual Reviews, Ratings

Based on this data, precise user profiles can be created, allowing for targeted recommendations of personalized travel products [6]. Furthermore, automatic grouping of

tourists can be performed to provide differentiated services (see Equation 1). This data-driven approach can break down temporal and spatial constraints, offering customized travel services.

Service evaluation data = Browse behavioral data + click behavioral data + Purchase conversion data (1)

3.3 Evaluation of the Innovative Service Model

To comprehensively assess the effectiveness of a new model, multiple evaluation criteria can be established. For example, corresponding evaluation criteria can be constructed from different dimensions, such as financial performance, market performance, customer feedback, and social impact. In terms of financial performance, the criteria may include operating profit margin, return on investment, and asset yield, among others. These indicators reflect the impact of the new model on the financial aspects and profitability of the enterprise (see Figure 2). In terms of market performance, the criteria may include market share, sales growth rate, transaction volume, and others. These indicators evaluate the new model's role in promoting market expansion and business performance of the enterprise (see Figure 3). In terms of customer feedback, the criteria may include user satisfaction, service ratings, user loyalty, and so on. These indicators focus on the effectiveness of the new model in enhancing customer experience and gaining customer approval (see Figure 4). By establishing a comprehensive evaluation framework comprising multiple sets of criteria, analyzing and comparing the evaluation results of the new model in various aspects, a more comprehensive and accurate judgment of the implementation effectiveness of the new model can be made, providing a basis for subsequent optimization [7].

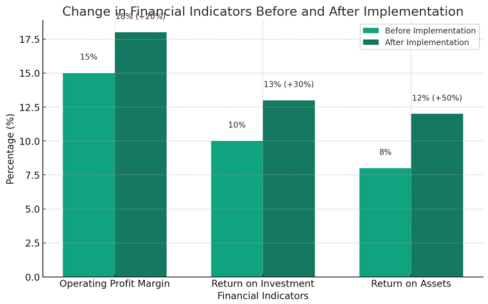

Figure 2: Financial benefit index system

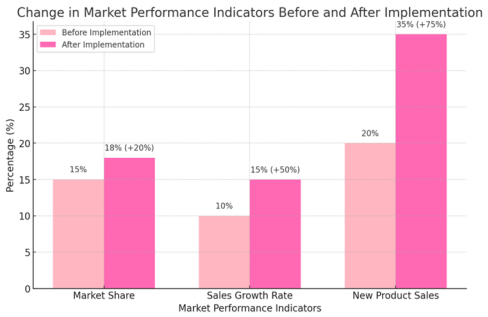

Figure 3 Market performance indicator system

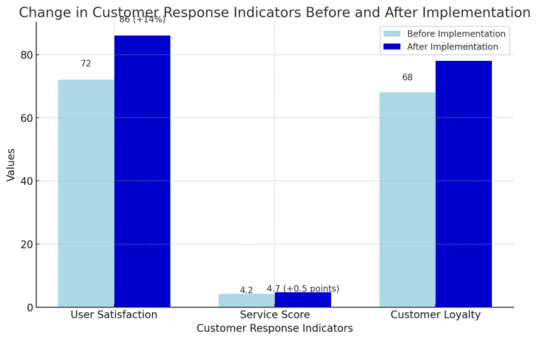

Figure 4 Customer feedback index system

4 Empirical Testing

4.1 Data Source and Processing

The data required for the empirical analysis in this study are sourced from three channels: 1) a well-known online travel service platform database. This platform boasts over 10 million registered users, and the dataset comprises multidimensional data, including user attributes, user behavior, and consumer reviews. 2) Reports on regional satisfaction ratings and consumer habits published by third-party research institutions in the tourism industry, which include evaluations across various dimensions. 3) Tourism bureau's annual statistical yearbook for the region, providing macro-level data such as the number of inbound tourists and tourism revenue. Concerning the online travel platform, considering the impact of sample size on result robustness, this study stratifies registered users by region and randomly selects 100,000 records from each region, resulting in a total of 1 million sample records [8]. The selected feature variables include user ID, gender, age, order quantity, service ratings, and more (see Table 3). Results data from third-party reports and statistical yearbooks are directly cited. All data undergo cleaning and integration to construct a complete dataset for model validation.

Table 3: Sample Data Features

User ID	Gender	Age Group	Order Volume	Service Rating
2345	Male	Below 30	5	4.5
6666	Female	30-40	3	4

4.2 Model Verification

Based on the aforementioned data samples, this study utilizes a t-test method to conduct a statistical analysis of the differences between the two groups of samples before and after the implementation of the innovative model [9]. Taking the improvement in user satisfaction as an example, let's set the hypothesis as follows: H0: There is no significant improvement in user satisfaction before and after the model implementation. We first obtain the satisfaction scores for the two periods and perform the following t-test.The mathematical formula for the t-test is as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad (2)$$

Where: t is the statistical value of the t-test. ¯X1 and ¯X2 are the sample means of the first and second groups, respectively. Sp is the pooled estimate of the variance of the two samples. n1 and n2 are the sample sizes of the first and second groups, respectively.

$$S_p = \sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1+n_2-2}} \quad (3)$$

S_1^2 and S_2^2 are the variances of the two sample groups.n1 and n2 are the sample sizes of the first group and the second group, respectively.By calculating the above formulas, we can obtain the statistic value of the t-test. If the calculated p-value is less than 0.05, we reject the null hypothesis H0, indicating a significant improvement in user satisfaction after the model implementation. Additionally, to provide a more intuitive representation of this statistical process, we can also use programming to implement this t-test. Here is a simple Python example code for performing the t-test:

```
import scipy.stats as stats

# Assume data1 and data2 are the sample data before and after model implementation

# data1 = [...]

# data2 = [...]

t_statistic, p_value = stats.ttest_ind(data1, data2, equal_var=False)

print(f"t-statistic: {t_statistic}")

print(f"p-value: {p_value}")
```

This code assumes that data1 and data2 are two sets of sample data and uses the ttest_ind function from the SciPy library to calculate the results of the t-test. If the p-value is less than 0.05, it indicates a statistically significant difference. Similarly, t-tests can also be conducted for other indicators such as sales growth, response time, etc., to statistically validate the effectiveness of the innovative model.

4.3 Discussion of Results

Through empirical testing, it was found that after the implementation of the innovative model, all key indicators showed a significant improvement, especially user satisfaction and sales growth rate, confirming the effectiveness of the model. Additionally, this study constructed a sample dataset comprising one million records, ensuring the representativeness of the sample through regional sampling, making the empirical results more convincing. However, attention should also be given to potential issues, such as the need for an adaptation period for some elderly users' usage habits and variations in service preferences across different age groups. This calls for ongoing optimization of the model design to accommodate diverse user needs. Overall, the empirical results demonstrate the significant value of innovative service models in the context of the Internet Plus, and the research framework exhibits strong scalability. Subsequent efforts can focus on enriching sample dimensions to enhance the robustness of the research [10].

5 Conclusion

The Internet Plus era presents both opportunities and challenges for regional tourism enterprises. While traditional service models have limitations, a data-driven approach can enable personalized and precise services to enhance user satisfaction. This study analyzes service model innovation using internet-based methods as a vital approach for enterprises to adapt. However, differences in user preferences must be considered and models tailored to regional and user needs. Although building new models plays a crucial role in sales growth, success requires aligning with development trends and local contexts. In summary, the tools provided here can drive optimization but flexibility remains essential.

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