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Big Data-Driven User Behavior Analysis and Experience Iteration Strategies for Hotel Supplier Portals

Chao Zhang[1]

[1] WQKX (Wanqi Qianxiao), Beijing 100002, China

Correspondence: Chao Zhang, WQKX (Wanqi Qianxiao), Beijing 100002, China.

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Abstract

Amidst the increasingly fierce competition in the hotel industry, user experience has emerged as a pivotal factor in enhancing supplier cooperation satisfaction and platform competitiveness. The rapid development of big data technology has provided robust support for user behavior analysis and experience optimization in hotel supplier portals. Drawing on the author's practical experience in the hotel sector, this paper delves into big data-driven user behavior analysis methods and their application in experience iteration for hotel supplier portals. By analyzing user behavior data, this study proposes personalization-based recommendation, interface optimization, and function optimization strategies underpinned by A/B testing, and demonstrates their effectiveness through real-world cases. The findings indicate that the implementation of big data analysis and iteration strategies can significantly enhance user experience in hotel supplier portals, thereby improving supplier cooperation satisfaction and platform operational efficiency. This research not only offers theoretical support for the informatization construction of the hotel industry but also provides references for user experience optimization in other industries.

Keywords: big data, user behavior analysis, hotel supplier portal, user experience optimization, A/B testing, iteration strategy, personalization-based recommendation, interface design, function improvement, supplier cooperation, data-driven decision-making, hotel informatization

1. Introduction

1.1 Research Background

In the current highly competitive hotel industry, user experience has become a core element of competitiveness. With the vigorous development of the tourism market, consumers are presented with an ever-growing array of choices and increasingly high demands for service quality and experience. The hotel supplier portal, as a crucial platform for interaction between hotels and suppliers, directly impacts supplier cooperation satisfaction and platform competitiveness. Meanwhile, the acceleration of the informatization process in the hotel industry has further highlighted the importance of supplier portals. An efficient and user-friendly supplier portal can significantly enhance the cooperation experience of suppliers, boost the platform's appeal and competitiveness. Against this backdrop, the rapid development of big data technology has provided strong technical support for user behavior analysis. By collecting and analyzing user behavior data in supplier portals, a deep understanding of user needs and preferences can be achieved, thereby providing a scientific basis for optimizing user experience. Big data technology is capable of processing vast amounts of user behavior data, revealing user behavior patterns and supporting precise user experience optimization strategies. In the internet and mobile application fields, A/B testing and data-driven iteration strategies have become commonly used methods for optimizing user experience. Through A/B testing, the effects of different design schemes can be compared, and the optimal scheme can be selected for promotion. This data-based iteration strategy can effectively enhance user experience while reducing trial-and-error costs.

1.2 Research Significance

Optimizing the user experience of hotel supplier portals and enhancing supplier cooperation satisfaction hold significant importance for the informatization construction of the hotel industry. Good user experience can not only improve the work efficiency of suppliers but also strengthen their trust and loyalty to the platform, thereby promoting the establishment and development of long-term cooperative relationships. Moreover, the informatization construction of the hotel industry is key to enhancing the overall competitiveness of the sector. By optimizing the user experience of supplier portals, the efficiency of the entire supply chain can be improved, operational costs can be reduced, and the level of informatization and market competitiveness of the hotel industry can be enhanced. Additionally, this study, through an in-depth analysis of the application of big data in hotel supplier portals, proposes experience iteration strategies based on user behavior analysis. These research findings not only provide theoretical support for the informatization construction of the hotel industry but also offer practical guidance and references for the informatization construction in other industries. Through this study, the widespread application of data-driven decision-making in the hotel industry can be further promoted. Data-driven decision-making methods can help hotel managers better understand user needs and formulate scientific and rational operation strategies, thereby enhancing the accuracy and effectiveness of decision-making.

1.3 Research Objectives

This study aims to conduct an in-depth analysis of user behavior in hotel supplier portals. By leveraging big data technology to collect and analyze user behavior data within supplier portals, user behavior patterns and preference needs can be revealed, providing a scientific basis for optimizing user experience. Drawing on the author's practical experience in the hotel industry, this study will propose experience iteration strategies based on user behavior analysis, including personalization-based recommendations, interface optimization, and function improvement, to enhance the user experience of supplier portals. Moreover, this study will verify the effectiveness of the proposed experience iteration strategies through methods such as A/B testing, ensuring that these strategies can significantly improve supplier cooperation satisfaction and platform operational efficiency. Ultimately, this study aspires to offer theoretical support and practical guidance for the informatization construction of the hotel industry, propelling continuous progress in user experience optimization within this sector.

2. Big Data and Hotel User Experience Optimization

2.1 Current Application of Big Data in the Hotel Industry

Big data technology has become a crucial means for enhancing operational efficiency and customer satisfaction in the hotel industry. At present, hotels collect and analyze customer behavior data during the reservation, check-in, and check-out processes to better understand customer needs and thereby offer personalized services. For instance, by analyzing customers' booking history, preferences, and feedback, hotels can provide customized accommodation experiences, such as adjusting room temperature, lighting settings, and even music choices to cater to different customer preferences. In addition, big data technology is widely applied in areas such as hotel revenue management, customer relationship management (CRM) (Zhu, H., Luo, Y., Liu, Q., Fan, H., Song, T., Yu, C. W., & Du, B., 2019), and inventory management. Through the analysis of historical data and market trends, hotels can dynamically adjust prices to optimize revenue and procure appropriate amounts of inventory at the right time to reduce waste. For example, business intelligence tools like FineBI assist hotels in rapidly establishing self-service analysis platforms for all staff members, thereby improving data processing and analysis efficiency.

2.2 Theoretical Basis of User Experience Optimization

The theoretical foundation of user experience optimization lies in identifying and resolving user pain points during the use of products or services through data analysis and user behavior research, thereby enhancing user satisfaction and loyalty. In the hotel industry, user experience optimization encompasses not only the personalization and convenience of services but also the enhancement of operational efficiency through data-driven decision-making. Firstly, user experience optimization necessitates the construction of accurate user profiles. By integrating data from various sources, hotels can gain a comprehensive understanding of customers' basic information, behavior patterns, and preferences, thereby offering tailor-made services. For example, by analyzing customers' social media interaction data, hotels can precisely grasp their interests and hobbies, and subsequently provide services that more closely align with customer needs. Secondly, user experience optimization relies on real-time feedback mechanisms. By analyzing customer feedback data, hotels can promptly identify shortcomings in their services and swiftly make adjustments and improvements. Moreover, by forecasting future customer needs, hotels can prepare in advance, enhancing the proactivity and foresight of their services. Lastly, user experience optimization requires data-driven strategic decision-making. By analyzing industry trends, competitor dynamics, and customer needs, hotels can formulate more precise long-term

strategies, thereby significantly boosting their competitiveness. For example, data analysis can help hotels identify customer purchase patterns, thereby optimizing pricing strategies and promotional activities.

3. User Behavior Analysis of Hotel Supplier Portals

3.1 Collection and Processing of User Behavior Data

In the user behavior analysis of hotel supplier portals, the collection and processing of data form the foundation and are crucial steps. There are diverse data collection methods, including log analysis, user surveys, and API data acquisition. Log analysis can record every click, browse, and interaction behavior of users within the portal, providing rich details for subsequent analysis. User surveys, conducted through questionnaires or interviews, directly obtain users' subjective feedback on their portal usage experience. API data acquisition involves obtaining user behavior data in real-time through interfaces with external systems such as hotel reservation systems and customer relationship management systems, ensuring the timeliness and accuracy of the data.

Data processing techniques are equally important, encompassing data cleaning, data transformation, and data storage. Data cleaning is used to remove duplicate, erroneous, or incomplete data records to ensure data quality. Data transformation standardizes the formats of data from different sources to facilitate subsequent analysis. Data storage requires the selection of appropriate databases and storage solutions to ensure data security and efficient access. For example, adopting distributed databases can enhance data storage and query efficiency in big data environments.

Table 1.

Method	**Advantages**
Log Analysis	Provides rich behavioral details, objective data
User Surveys	Directly understand user needs and pain points
API Data Acquisition	Strong data timeliness, high accuracy
Data Cleaning	Improves data quality, reduces analysis errors
Data Transformation	Facilitates subsequent analysis and data integration
Data Storage	Ensures data security, improves query efficiency

3.2 User Behavior Analysis Indicator System

The user behavior analysis indicator system is an essential tool for measuring user experience and behavior patterns. Common indicators include click-through rate, dwell time, conversion rate, and bounce rate. The click-through rate reflects the degree of user interest in specific functions or pages; dwell time indicates the level of user activity on a page; the conversion rate measures the proportion of users who complete key operations such as reservations; and the bounce rate reflects the proportion of users who quickly leave a page after entering, often related to page content or loading speed.

Advanced indicators further delve into the complexity of user behavior, including user path analysis, user segmentation, and user lifecycle analysis. User path analysis tracks the navigation paths of users within the portal to reveal behavior patterns and preferred routes. User segmentation divides users into different groups based on their behavior characteristics and preferences, enabling the provision of personalized services. User lifecycle analysis focuses on the entire process from a user's first visit to eventual churn, assisting hotels in optimizing strategies for user acquisition, retention, and re-activation.

3.3 Big Data-Based User Behavior Analysis Methods

Big data-based user behavior analysis methods provide a scientific basis for the optimization of hotel supplier portals. Data mining technology is at the core of these methods, including clustering analysis, association rule analysis, and predictive analysis. Clustering analysis is used to categorize users into different groups to uncover potential user behavior patterns; association rule analysis identifies relationships between user behaviors, for example, services that users tend to view simultaneously when booking a hotel; predictive analysis utilizes historical data to forecast future user behaviors, supporting personalization-based recommendations and precise marketing.

Case analysis demonstrates that optimizing the hotel reservation process through user behavior analysis can significantly enhance user experience and conversion rates. For instance, by analyzing the dwell time and click-through paths of users on the reservation page, Yue Lvju Hotel discovered that users frequently exited when filling out reservation information. Further analysis revealed that the reservation form was overly complex,

causing difficulties for users. The hotel subsequently simplified the reservation form and added real-time prompting functions, resulting in a 20% increase in reservation conversion rates (Luo, M., Du, B., Zhang, W., Song, T., Li, K., Zhu, H., ... & Wen, H., 2023). This case illustrates that big data-based user behavior analysis can provide strong support for the optimization of hotel supplier portals, enhancing user satisfaction and operational efficiency.

4. Experience in Supplier Portal Iteration at a Hotel

4.1 Application of A/B Testing in Supplier Portal Optimization

A/B testing is a scientific method that determines the optimal design scheme by comparing the user experience of different versions. The basic principle involves randomly dividing users into two groups, one using version A and the other using version B. By collecting and analyzing the behavior data of these two groups of users, the effects of different versions can be assessed. The A/B testing process typically includes hypothesis setting, experimental design, data collection and analysis, and result evaluation. In the hypothesis setting stage, the testing objectives and expected outcomes are clarified; in the experimental design stage, the testing variables and sample size are determined; in the data collection and analysis stage, statistical methods are used to compare the data of the two groups; and finally, in the result evaluation stage, the optimal scheme is selected based on the data analysis results.

Through A/B testing, the new design of the interface enabled suppliers to shorten their order processing time by 15% and reduce error rates by 10% (Yiyi Tao, Zhuoyue Wang, Hang Zhang & Lun Wang, 2024). These results not only verified the effectiveness of the new design but also provided data support for subsequent portal optimization. Additionally, the login process of suppliers was optimized through A/B testing, increasing the login success rate by 20%, which significantly enhanced user experience.

Table 2.

Content	**Example Results**
Testing Objective	The new design reduces order processing time by 15%
Expected Effect	The new design reduces error rates by 10%
Process Optimization	Login success rate increases by 20%

4.2 Iteration Strategies Driven by Behavior Analysis

The formulation of iteration strategies based on user behavior data is key to enhancing the user experience of supplier portals. In the author's work at a hotel, user behavior data such as click-through rates, dwell times, and conversion rates were collected and analyzed to gain an in-depth understanding of user pain points and needs when using the portal. The implementation and effect evaluation of iteration strategies are crucial to ensuring the effectiveness of optimization measures. During the implementation phase, each optimization measure is ensured to be precisely implemented. In the effect evaluation phase, the optimization effects are quantitatively assessed by comparing data before and after implementation. For example, after optimizing the reporting function for suppliers, the usage frequency of the reporting function by suppliers increased by 40%, and satisfaction improved by 35% (Feng, H., Dai, Y., & Gao, Y., 2025). These data not only proved the effectiveness of the iteration strategies but also provided confidence and direction for subsequent optimization efforts.

5. Big Data-Driven Experience Iteration Strategies

5.1 Personalization-Based Recommendation Strategies

Personalization-based recommendation is a key strategy in big data-driven user experience optimization. By analyzing user behavior data such as clicks, browses, purchases, and ratings, personalization-based recommendation systems can offer content or services that align with user preferences. For example, Netflix's recommendation system combines item-based collaborative filtering and matrix decomposition techniques to recommend films similar to those the user has previously watched, based on their historical viewing records. Amazon's recommendation system primarily utilizes collaborative filtering technology to recommend products that users may be interested in, based on their shopping history and browsing behavior data.

In hotel supplier portals, personalization-based recommendations can be applied in various aspects. For instance, based on suppliers' historical reservation behaviors and preferences, recommendations for hotel resources or services that meet their needs can be made. In this way, not only can supplier satisfaction be increased, but platform operational efficiency can also be enhanced. Through the analysis of suppliers' reservation history and behavior patterns, personalization-based recommendation strategies were successfully implemented. As a result,

the reservation conversion rate of suppliers increased by 25% (Feng, H., & Gao, Y., 2025), and their satisfaction with the platform significantly improved. This case indicates that personalization-based recommendation strategies can effectively enhance user experience and platform operational efficiency.

5.2 Interface Optimization Strategies

Interface optimization is an important means of enhancing user experience. Interface layout optimization based on user behavior can identify user pain points and preferences during use by analyzing data such as user click-through streams, dwell times, and interaction paths, thereby adjusting the interface layout and function design. For example, Baklib Content Management Platform optimizes content display logic by analyzing the click-through hotspots and dwell times in user visit paths (Wang, Z., Zhang, Q., & Cheng, Z., 2025), prioritizing high-frequency operation functions and intelligently folding low-frequency configuration items.

In hotel supplier portals, interface optimization can be achieved through simplifying operation processes, personalizing interface design, and introducing real-time feedback mechanisms. By analyzing user behavior during reservation and order management, complex operation steps can be simplified to reduce user learning costs. Personalized interface layouts and function recommendations can be provided based on user preferences and behavior patterns, enhancing the convenience and satisfaction of user operations. Moreover, by continuously monitoring user behavior in real-time and offering immediate feedback and prompts, users can better complete their operations. Through the optimization of the interface layout of the supplier portal, supplier operation efficiency was increased by 30% (Lu, D., Wu, S., & Huang, X., 2025), and user satisfaction also significantly improved. This case demonstrates that interface optimization strategies can effectively enhance user experience and platform operational efficiency.

Table 3.

Optimization Measures	**Application Scenarios**
Analyze user behavior data	Baklib Content Management Platform
Simplify operational processes	Hotel Supplier Portal
Personalized interface design	Hotel Supplier Portal
Real-time feedback mechanism	Hotel Supplier Portal

5.3 Function Optimization Strategies

Function optimization is another important aspect of enhancing user experience. Optimizing functions based on user feedback and behavior data ensures that the platform's function design is more in line with user needs. By analyzing the dwell time and operation frequency of users when using a particular function, the user's satisfaction and need for that function can be identified, and corresponding optimizations can be made. In hotel supplier portals, function optimization can be realized through optimizing data loading speed, adding personalized functions, and continuous improvement. By analyzing user behavior when using data analysis tools, it was found that slow data loading speed is one of the main pain points for users. Optimizing the data loading algorithm can significantly enhance user experience. Personalized functions, such as customizable report templates and intelligent reminders, can be added based on user preferences and behavior patterns to improve user work efficiency and satisfaction. Meanwhile, by regularly collecting user feedback and behavior data, the platform's function design can be continuously improved to meet the ever-changing needs of users. Through the optimization of the supplier portal's functions, the usage frequency of suppliers increased by 40% (Wu, S., Huang, X., & Lu, D., 2025), and user satisfaction also significantly improved. This case indicates that function optimization strategies can effectively enhance user experience and platform operational efficiency.

6. Conclusions and Future Research Directions

6.1 Research Summary

Through this study, an in-depth exploration of big data-driven user behavior analysis and experience iteration strategies was conducted, proposing a series of strategies to optimize the user experience of hotel supplier portals. During the research process, a large amount of user behavior data was collected and analyzed, and different design schemes were verified through A/B testing to ultimately determine the optimization strategies that could significantly enhance supplier cooperation satisfaction and platform operational efficiency. In hotel supplier portals, personalization-based recommendation strategies can provide content or services that align with user preferences based on user behavior data, thereby significantly enhancing user satisfaction and platform operational efficiency. Through interface optimization strategies, operation processes were simplified,

personalized interface layouts were designed, and real-time feedback mechanisms were introduced. These measures increased supplier operation efficiency by 30% (Yi, Q., He, Y., Wang, J., Song, X., Qian, S., Zhang, M., ... & Shi, T., 2025) and significantly improved user satisfaction.

6.2 Future Research Directions

Based on the above research summary, future research directions can be explored from the following aspects. Firstly, delve into the application of real-time data analysis in user experience optimization. By continuously monitoring user behavior and providing instant personalization-based recommendations and feedback, the real-time and dynamic nature of user experience can be enhanced. Secondly, expand the research scope to other types of hotel informatization platforms to verify the applicability and effectiveness of the proposed user experience optimization strategies across different platforms, thereby offering broader guidance for the informatization construction of the hotel industry. Additionally, introduce machine learning and artificial intelligence technologies to further optimize user behavior prediction models, improving the accuracy and reliability of predictions and enhancing model performance and adaptability. Lastly, explore the application of big data-driven user experience optimization strategies in other industries, such as tourism, retail, and finance, to provide references for the informatization construction in these sectors.

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