Design and Implementation of Hotel Network Management Information System in the Era of Big Data

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Abstract. The huge growth of social media and consumer generated content on the Internet has inspired the development of so-called big data analysis to understand and solve real-life problems. However, although a few studies have used new data sources to solve the important research problems in the hotel industry, there is no systematic application of big data analysis technology in these studies. The purpose of this study is to explore and demonstrate the utility of big data analysis to better understand important hotel industry issues. The software is used to analyze the big data generated in the hotel reservation module, customer check module and customer bill module in the hotel management system. This paper discusses the dimensions of hotel service quality, evaluates its relative importance, and evaluates the service quality of Furtherance hotel from the perspective of guests. Through the analysis of academic research and hotel operators' current practice, this paper sorts out and clarifies the problems related to online reviews. Taking advantage of the advantages of user reviews, this paper aims to provide new insights into the determinants of hotel customer satisfaction by distinguishing customers from different linguistic groups. The results show that the return on net assets is 34%, the return on total assets is 26%, the profit margin on sales is 16%, and the asset liability ratio is 21%.

Keywords: Big Data, Hotel Management, Network Marketing, System of Information

1. Introduction
With the continuous development of science and technology, computer technology has become indispensable in our life. Nowadays, the development of hotel management industry relies more and more on big data analysis. Data collection, sorting, optimization, mining, integrated research and analysis are of great help to hotel management.

With the continuous progress of information technology, many experts have studied hotel management. For example, some domestic teams have studied the network marketing of Dali resort hotel. According to the importance of online marketing and the related needs of resort hotel network marketing, combined with the current situation of relatively lack of resort hotel network marketing, this paper studies the network marketing strategy of Dali I resort hotel. Through the analysis of Dali resort hotel network marketing environment, according to different target customers, the target groups and market positioning are divided, and the marketing strategy of differentiation, centralization and
development is selected in the marketing strategy [1]. According to the target market positioning and the choice of marketing strategy, in terms of product, price, promotion and channel strategy, targeted and differentiated marketing strategy design is carried out according to the specific situation to ensure that the network marketing is consistent with the overall marketing goal and hotel network marketing demand; in order to ensure the implementation of marketing strategy, service marketing should also be paid attention to in customer management, in order to optimize customers. In the internal personnel management, we should improve the quality of network service by improving the quality and ability of network marketing. According to the particularity of Dali resort hotel network marketing, personalized network service system should be adopted to improve the service experience of network customers. Some experts have studied the construction of wireless Wi-Fi network system in high star hotels. The wireless controller is combined with fit AP mode and IEEE 802.11n standard is adopted. At the same time, wireless network and wireless network management scheme are adopted, such as wireless network, wireless network security monitoring scheme, wireless network security monitoring scheme, wireless network security monitoring scheme, wireless network security monitoring scheme and so on. The ceiling installation scheme is adopted for wireless AP equipment. According to the characteristics of hotel rooms, restaurants, banquet halls, lobbies and public areas, the wireless network construction schemes such as spectrum planning, channel planning, regional coverage strategy, number of concurrent users, networking structure, authentication method, network security protection are given. After the data planning is completed, the wireless AP port and wireless AC controller configuration of the hotel wireless Wi-Fi network system are set. The first step of information dissemination and utilization is to establish a specific big data model. It is pointed out that data collection and evaluation is a key component of any hotel's success, and its important component is the wisdom and intuition of the management team that focuses on interpreting a large amount of data [2]. Some experts have studied the design and implementation of hotel special server based on Linux. When the deposit data representing the deposit used to use the service in the hotel in which the casino is installed is entered, a housing card with user information that can identify the user is issued; the casino deposit that enables the user to use the casino service when obtaining the housing card is managed, and the user's use of the casino service is restricted according to the restrictions on the use of the casino deposit. Therefore, hotel services and casino services of Hotels with casinos are integrated. Using visualization and configuration management, each defined role of a real computer system can be realized as a self-management agent, which can sense other related roles in the same broader context. This paper presents and discusses a prototype implementation of Web hotel services for customers. Hotel services have become the representative trend of integrating with the international market. In order to meet this challenge, the hotel must improve the overall competitiveness, enhance the overall competitiveness, managers must change the management mode, improve the management level of the hotel [3]. With the development of people, the research results of hotel management have been quite fruitful, but in the era of big data, the research on the design and implementation of hotel network management information system is still insufficient.

In this paper, in order to study the design and implementation of hotel network management information system in the era of big data, through the study of big data, we found K coefficient model, the results show that big data technology is conducive to the design of hotel network management information system.

2. Method

2.1. Big Data Technology

(1) Big data technology

Big data is not only reflected in the scale of data, but also a huge amount of information assets. It needs efficient, low-cost, innovative data analysis and processing to improve the insight and analysis ability of things [4]. Big data marketing is the whole process of collecting and analyzing the characteristics of big data, publicizing relevant information according to the obtained results,
encouraging customer participation, completing information dissemination, and evaluating the communication effect through customer participation [5]. Big data marketing can effectively connect the internal products and services of the enterprise with the external consumers to ensure that the marketing is more in line with the needs of customers [6].

(2) Hotel network marketing

Compared with the traditional hotel marketing, hotel network marketing is a digital interactive marketing based on computer, tablet computer, digital TV, mobile phone and other terminal platforms with the help of the Internet. Hotel marketing has the characteristics of general network marketing. At the same time, according to the marketing needs of different hotels and the actual situation of hotels, it shows the differences of hotel network marketing [7]. For example, in the online marketing of resort hotels, we should pay full attention to tourism websites, and carry out targeted marketing on industry information publishing websites, public service websites and other media. Network marketing is marketing on the Internet, so network marketing is based on marketing theory [8]. Marketing strategy is based on customer demand analysis, according to the external environment and industry environment, combined with the specific situation of the enterprise, planning the business activities of the enterprise, coordinating the strategies of products, prices, channels, promotion, etc., so as to provide customers with the best products and services, so as to achieve the enterprise goals [9]. Hotel marketing is a series of business activities in the hotel business activities, according to the hotel development strategy, product characteristics and service characteristics, combined with the hotel development goals, customer needs and market positioning, to carry out hotel brand promotion, product introduction and customer demand satisfaction, in order to fully develop the hotel market potential, expand the hotel target customer group, and promote the hotel revenue growth. Compared with general enterprise marketing, hotel marketing includes market segmentation and target group division, product and service combination mode, price strategy, marketing channel and promotion means [10]. For the hotel, the effective marketing means can not only fully reflect the advantages of the hotel, promote the optimal allocation of all resources in the hotel, but also can improve the good feeling of consumers to the hotel, improve the stickiness of consumers, and ensure the possibility of long-term development of the hotel [11].

2.2. K-coefficient Model

In the actual wireless communication environment, the influence of various terrain should also be considered in wireless coverage prediction. We need to improve the propagation of this model. Considering the influence of various ground features and terrain on radio wave propagation in the actual environment, the accuracy of coverage prediction results can be better guaranteed. A series of K coefficients are used to represent the general model of wireless network planning software, as shown in formula (1-4):

\[
L_p = K_1 + K_2 \lg d + K_3 (h_m) + K_4 \lg h_m + K_5 \lg (h_{\text{eff}}) \tag{1}
\]

\[
S = \frac{P_i G_T}{4\pi d^2} \tag{2}
\]

\[
P_R = s \cdot A_R = \frac{P_i G_T}{4\pi d^2} A_R \tag{3}
\]

\[
A_R = \frac{\lambda^2}{4\pi} G_R \tag{4}
\]
3. Experience

3.1. Experimental Object Extraction
The next step is to design the database table in the system. Before the formal design of the tables in the database, the database design requirements should be implemented. For this system, the database is the centralized storage of system data. The quality of database design directly affects the access efficiency and the corresponding ability of the system. We can also design the relationship between each class according to the relationship between them. Therefore, we should optimize according to the principle of database design to ensure the efficiency and stability of data design.

3.2. Experimental Analysis
For this system, a web software system based on B / S structure is constructed. When redesigning the database, we should not only restrict according to the database design paradigm, but also have higher requirements for the security of database design and the stability of system access. The specific design requirements are as follows: first of all, the design of database should follow the design paradigm, not adhere to the design paradigm, everything is necessary for the safe and efficient use of the system, which is very important for the long-term storage and use of data. Secondly, the database design follows the simple and clear design idea. The design of table fields in database is named in English, and the corresponding functions of these fields can be defined by text. The corresponding description and remarks are recorded in the form of database design and managed according to the requirements of national standard documents, which is convenient for secondary development and daily use and maintenance. Third, it is worth noting that in the process of database design, the redundancy design of database information is very important. In order to improve the efficiency of data access and user experience, we must coordinate the relationship between them in the process of development and design. Fourth, for the constraints in the database, first of all, we should ensure that the system data is protected by the constraints of the database design to prevent the inconsistency of data storage in the system development. Especially when a large number of users access the same data, we must ensure that users can not modify the data to achieve consistent access to the data. Fifth, database security requirements. Because the database is the data core of the whole system, its security requirements are very high, so for the database system, we must ensure the security measures of the database. Such as data access field encryption, database data access port modification and so on.

4. Discussion

4.1. Financial Growth
Since the company began to try online marketing in 2018, the company has adopted the following situation. Through the analysis, it can be found that in 2018, the company's sales profit margin increased significantly, and the growth rate of the main hotel business increased to 70%, indicating that with the help of hotel marketing, the hotel business development of the company group has improved significantly. As shown in Table 1.

| type                      | data  |
|---------------------------|-------|
| Return on net assets      | 34%   |
| Return on total assets    | 26%   |
| Profit margin of sales    | 16%   |
| Asset liability ratio     | 21%   |

From the above, the return on net assets is 34%, the return on total assets is 26%, the profit margin on sales is 16%, and the asset liability ratio is 21%. The results are shown in Figure 2.
It can be seen from the above that the rate of return on net assets accounts for the highest proportion, the profit rate of sales accounts for the lowest proportion, and the rate of return on total assets accounts for more than the ratio of assets and liabilities.

4.2. Communication Function Test Results
Test Hotel server data storage and software, database update and other functions: using PC or mobile devices under different network environment as remote control terminal, through the test to obtain the user record data of hotel server, control the update of server database and service software. In the process of testing the data storage and update of the hotel server, the size of the data file and software file of the hotel server is usually less than tens of megabytes. Therefore, taking file size and network bandwidth as influencing factors, the time of remote data collection and update of hotel server is simulated. As shown in Table 2.

| Number of experiments | File size (MB) | The network bandwidth is 10MB / s | The network bandwidth is 50Mb/s | The network bandwidth is 100MB / s |
|-----------------------|----------------|----------------------------------|---------------------------------|----------------------------------|
| 1                     | 3.14           | 2.67                             | 2.83                            | 3.83                             |
| 2                     | 3.73           | 2.84                             | 1.93                            | 2.04                             |
| 3                     | 3.72           | 3.18                             | 1.83                            | 1.94                             |
| 4                     | 2.09           | 1.83                             | 0.87                            | 3.74                             |

It can be seen from the above that the network bandwidth of 3.14mb is 10mb-2.67s, that of 3.73mb is 10mb-2.84s, that of 3.72mb is 10mb-3.18s, and that of 2.09mb is 10mb-1.83s. The results are shown in Figure 2.
It can be seen from the above that in the experiment number 1, the file size of 3.14mb, the network bandwidth of 10MB / s has the fastest transmission speed, and the network bandwidth of 100MB / s has the slowest transmission speed.

5. Conclusion
Online display is essential for tourism organizations, and the quality of websites will affect customers. In the case of hotels, there are many studies that evaluate the performance of websites based on function, usability and other factors, not to mention the different amounts of information provided to consumers. In the near future, through the use of big data, hotel websites will be dynamic. They will dynamically adjust themselves and display personalized information to each consumer. Based on advanced data collection, extraction, integration, and analysis of large datasets, provide historical, current, and predictive views of business operations to improve decision making. In the era of big data, tourism hotels should have a sense of competitive intelligence, grasp the key points of competitive intelligence, and establish an efficient and simple framework for the collection, analysis and utilization of competitive intelligence. This paper discusses the future development direction of revenue management, which is considered by major scholars and hotel industry. This paper compares and analyzes the academic literature and professional literature of revenue management, and puts forward three related fields of revenue management: personnel, process and process, and technology. Finally, this paper gives a comprehensive conclusion and future development direction, and points out the main challenges of revenue management.

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