A Study on Smart Hotel Management System Based on Big Data

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Abstract: The intelligent analysis of big data provides more efficient technical solutions for smart hotel management, and has also become a key support technology for smart hotel construction.This paper starts from analyzing the connotation of big data and smart hotel management, explores the construction method and application strategies of smart hotel management system based on big data, and uses the case of Marriott International Group to show the application effect of big data in actual hotel management.Conclusion shows that big data technology has not only had a significant impact on the operating pattern of current hotel industry, but also has guiding significance for the future development trend of tourism industry.

1. Introduction

With the rapid development of information technology, especially the widespread application of big data technology, the traditional hotel management model is undergoing a profound change.As the representative of this change, smart hotel not only improves the customer experience, but also brings unprecedented efficiency and accuracy to hotel management[1].The core of the smart hotel is to use big data technology to capture, analyze and use customer data to provide more accurate services.By analyzing massive data, hotels can better understand customer preferences and behavior models, thereby provides more personalized services.In addition, big data technology can also help hotels to achieve more efficient operation management, such as energy management, inventory control and employee scheduling.In this context, big data has become a technical driving force for smart hotel quality upgrades and upgrades, and it is also a key factor in shaping the competitiveness of the modern hotel industry.

2. Theoretical explanation

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2.1. Concept of Big data

As the product of the information age, the concept of big data is mainly defined from the four basic features of data, namely Volume, Velocity, Variety and Veracity.[2]Big data technology is supported by advanced network information technology. Through the relevant technologies such as big data collection, pre-processing, storage and analysis, etc., valuable information hidden in massive data provides support for improving operational efficiency in all walks of life.With the development of cloud computing and the Internet of Things technology, big data technology has

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shown huge potential in terms of large-scale, complex types, and fast update data.

2.2. Principles of Big Data Technology

The core principles of big data technology mainly include data storage, data processing and data analysis.In terms of data storage, technologies such as distributed file systems and non -relational databases are widely used to process massive data.Data processing technology, such as MapReduce, allows complex data processing tasks to perform parallel on multiple computers, significantly improved the efficiency of data processing.In terms of data analysis, advanced technologies such as generating AI, machine learning and data mining can extract valuable information from a large amount of data to support decision-making.In particular, big data analysis can assist in decision-making through descriptive analysis such as describing historical data, predictive analysis such as predicting future trends and standardized analysis such as providing action recommendations.

3. Construction of smart hotel management system based on big data

3.1. Basic architecture of smart hotel management system based on big data

Oriented to improving the service efficiency of hotel operation and management, Smart Hotel Management System (SHMS) is a kind of comprehensive management system based on modern information technologies such as cloud computing and big data. As shown in Figure.1, in this system, big data analysis and business intelligence are technology-driven, and SHMS can provide hotel management personnel and customers with personalized, intelligent and one-stop services.[3]In general,subsystems such as front desk service system, backend management system, and data analysis system are the main parts in SHMS.

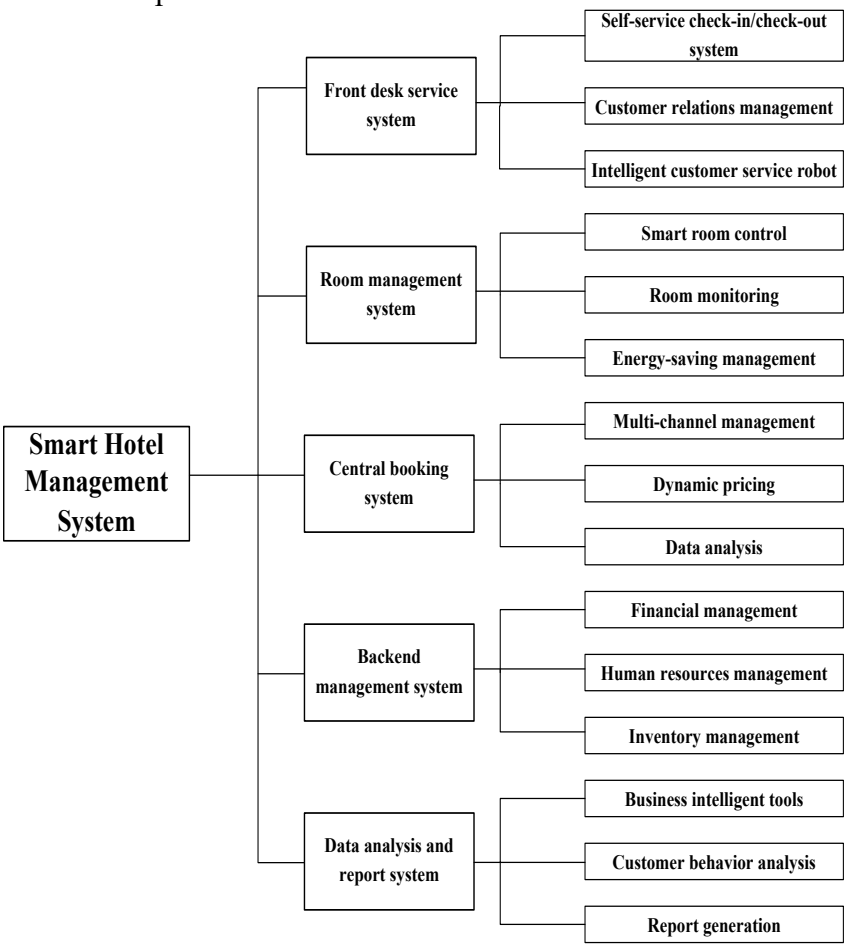

Figure 1 Basic architecture of smart hotel management system

3.2. Front desk service system

The main functional parts of front desk service system include the follows:

- Self-service check-in/check-out system. Through self-service terminals or mobile applications, customers can easily complete the check-in and check-out process to reduce the waiting time during the tour.
- Customer Relations Management. Integrate historical data of customers, such as booking habits, accommodation preferences and feedback to provide more personalized services.
- Intelligent customer service robot.Using artificial intelligence technology to answer the common questions of customers, and provide 24/7 services to improve customer experience.

3.3. Room management system

The main functional parts of room management system include the follows:

- Smart room control. Using IoT technology, customers can control the lights, temperature, curtains, etc. through intelligent devices.
- Room monitoring.Real-time monitoring of the state of the room, such as cleaning and maintenance needs to ensure efficient room management.
- Energy-saving management.Automatically adjust the energy use of the room, such as air conditioning and lighting to optimize energy consumption.

3.4. Central booking system

The main functional parts of central booking system include the follows:

- Multi-channel management.Integrate reservations from different channels such as official website, OTA, telephone, etc. to update the house attitude in real time.
- Dynamic pricing.Adjust house prices according to market demand and booking to obtain maximize returns.
- Data analysis. Analyze and book data, identify trends and models, and use it to formulate marketing strategies.

3.5. Backend management system

The main functional parts of backend management system include the follows:

- Financial management.Automation processing accounts, invoices, and reports to improve the accuracy and efficiency of financial management.
- Human Resources Management.Manage employees' schedule, performance and training to ensure efficient human resources use.
- Inventory management.Monitor inventory levels, automatically replenish, and reduce waste.

3.6. Data analysis and report system

The main functional parts of data analysis and report system include the follows:

- Business intelligent tools.By analyzing various operating data, providing insights, and helping manager to make data-driven decisions.[4]
- Customer behavior analysis.In-depth understanding of customer preferences and behaviors to optimize services and custom marketing activities.
- Report generation.Automation generate various operations and financial reports, simplify the management process.

4. Case analysis: Marriott International Group's Big Data Drives Smart Hotel Management

As one of the world's largest hotel management companies, MARRIOTT International Group actively adopts big data technology to improve customer satisfaction and operating efficiency.

4.1. Personalized service

Marriott uses big data to analyze customer historical check -in records, preferences, and feedback to provide personalized services.Customers can choose room type, bed configuration,

check -in time, etc. when booking.In addition, they can enjoy special welcome gifts, customized catering menus and recommended tourism activities.These personalized services have improved customer satisfaction, making guests feel that they have received special attention and care.

4.2. Price optimization

Marriott uses big data analysis market demand, competitive price and customer booking trend to dynamically adjust house prices.This price optimization strategy can ensure that the hotel provides reasonable prices in different time periods to meet customer needs.For example, at the peak demand, house prices may be increased, and in the off -season, house prices may be reduced to increase the rental rate and income of the room.

4.3. Demand forecasting

Based on big data analysis, Marriott can predict customer demand peak and off -season, thereby adjusting employee class and inventory management.By predicting the needs of customers in advance and catering, they can effectively allocate resources, reduce operating costs, and improve customer satisfaction.[5]

One of the key factor of Marriott's success is that they have established a data -driven culture.This means that employees are encouraged to use data to guide decisions and actions.This culture ensures that data is fully utilized in hotel management and has become the core component of business decisions.Marriott's attention to customer experience is an important part of their success.They analyze customer historical check -in records, preferences and feedback through big data to provide customers with personalized services.This includes personalized room selection, welcome gifts, catering customization and travel advice.By meeting customer needs,Marriott improves customer satisfaction and establishes loyalty.Hotel groups are actively investing in technical infrastructure, including data analysis tools and systems.This investment helps ensure the quality and availability of the data, so that they can effectively manage and analyze a large amount of data.Marriott shows excellent rapid decision -making ability.

5. Conclusion

Big data has profoundly changed the structure of smart hotel management, bringing unprecedented opportunities and challenges to the hotel industry. In smart hotels, big data not only improves the customer experience, but also improves the quality of operating efficiency and business decision -making, and brings a deeper understanding of customers, optimizing resource utilization, increasing income, and reducing costs. Building and applying a smart hotel management system based on big data is a long -term and arduous task. With the continuous improvement of information technology, the construction of smart hotels requires research and practice of various investment entities and technologies to study and practice the development level of the smart hotel industry on emerging technologies such as big data, artificial intelligence, the Internet of Things and virtual reality. This meets the more personalized needs of customers.

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