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Digital Service Standard Construction and Practice Verification for Small and Medium-Sized Hotel Apartments

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Abstract

The rapid development of information technology has rendered the digital transformation of small-and-medium-sized hotel apartments crucial for enhancing competitiveness. However, the lack of unified digital service standards within the industry has led to uneven service quality. This study constructs a digital service standard framework for small-and-medium-sized hotel apartments, focusing on key aspects such as online booking, smart rooms, and security management. The feasibility and effectiveness of this framework are verified through a case study of Beijing Diman Apartment Management Co., Ltd. The results indicate that optimizing service processes and incorporating smart technologies can significantly improve booking success rates, customer satisfaction, equipment utilization rates, and service response speeds, while reducing operational costs and security risks. This study provides theoretical support and practical guidance for the digital transformation of small-and-medium-sized hotel apartments, holding significant theoretical and practical implications.

Keywords: small-and-medium-sized hotel apartments, digital services, service standards, construction path, practice verification, phased implementation, online booking, smart rooms, security management, operational optimization, information technology application, industry standards

1. Introduction

1.1 Research Background

In the era of rapid information technology development, the digital transformation of the hotel industry has become a key to enhancing competitiveness. Small-and-medium-sized hotel apartments, as an important part of the industry, face unprecedented opportunities and challenges. With increasing consumer demands for accommodation experiences, not only comfort but also convenience, intelligence, and personalized services are highly expected. However, the lack of unified digital service standards in small-and-medium-sized hotel apartments results in uneven service quality, affecting the overall development of the industry. Additionally, these hotels face issues such as high technology costs, complex system integration, and data security risks during the digital transformation process, which limit their digital development and market competitiveness. Therefore, constructing a scientific and rational digital service standard is of great significance for improving the service quality and operational efficiency of small-and-medium-sized hotel apartments.

1.2 Research Objectives

This study aims to construct a digital service standard suitable for small-and-medium-sized hotel apartments, providing theoretical support and practical guidance for the industry's digital transformation. By analyzing the current status and problems of digital services in small-and-medium-sized hotel apartments, this study constructs a scientific and rational digital service standard framework from core aspects such as online booking, smart rooms, and security management, and proposes a "phased implementation" path. Meanwhile, the feasibility and

effectiveness of the standard are verified through a case study of Beijing Diman Apartment Management Co., Ltd., offering an operable digital service optimization plan for other small-and-medium-sized hotel apartments.

1.3 Research Significance

This study holds significant theoretical and practical importance. Theoretically, it fills the research gap in digital service standards for small-and-medium-sized hotel apartments, providing a new theoretical framework and research perspective for the digital transformation of the hotel industry. Practically, by establishing unified service standards, the study helps standardize the service processes of small-and-medium-sized hotel apartments, improve service quality, and enhance customer satisfaction and loyalty. The verified case study also offers a replicable digital service optimization plan for other small-and-medium-sized hotel apartments, promoting the overall development of the industry.

2. Theoretical Basis and Construction Logic of Digital Service Standards for Small-and-Medium-Sized Hotel Apartments

2.1 Theoretical Basis for the Construction of Digital Service Standards

The construction of digital service standards is based on service science theory, information technology theory, and quality management theory. Service science theory emphasizes a user-centered approach, focusing on user experience and service quality during the service process, which provides small-and-medium-sized hotel apartments with a customer-satisfaction-oriented service philosophy. Information technology theory focuses on the application and integration of technology to ensure the efficiency and reliability of digital services, providing technical support for the digital transformation of hotel apartments. Quality management theory ensures the stability and consistency of services through standardization and continuous improvement, laying the foundation for the long-term development of service standards. These theories support each other, providing a solid theoretical basis for constructing a scientific and rational digital service standard.

2.2 Characteristics and Needs Analysis of Digital Services in Small-and-Medium-Sized Hotel Apartments

Small-and-medium-sized hotel apartments have unique characteristics and needs in digital services. Firstly, with limited funds and technological resources, these hotels find it hard to bear the high costs of digital transformation. According to a survey by the China Hotel Industry Association, the digital service penetration rate of small-and-medium-sized hotel apartments was only 35% in 2024, far lower than the 75% of large hotels. This indicates a huge potential for improvement in digital services for small-and-medium-sized hotel apartments. Secondly, the high demand for personalized services from consumers, who increasingly expect personalized and convenient accommodation experiences, is evident. A questionnaire survey reveals that consumers' digital service needs for small-and-medium-sized hotel apartments mainly focus on online booking, smart room facilities, mobile payment, and customer feedback systems. Lastly, the strong operational flexibility of small-and-medium-sized hotel apartments requires a rapid response to market changes and customer demands. These characteristics and needs dictate that in constructing digital service standards for small-and-medium-sized hotel apartments, a balance between cost-effectiveness, user experience, and operational efficiency must be emphasized.

2.3 Core Aspects and Key Indicators of Digital Service Standard Construction

The construction of digital service standards should revolve around core aspects, including online booking, smart rooms, security management, customer service, operation management systems, data analysis and application, marketing and promotion, etc. Each core aspect has key indicators to measure service quality and operational efficiency. For example, in online booking, key indicators include booking success rate, booking response time, and customer satisfaction. Currently, the average booking success rate for small-and-medium-sized hotel apartments is 88%, with a response time of 5 minutes and a customer satisfaction score of 4.2/5. By optimizing the booking system, these indicators can be significantly improved. In smart rooms, key indicators include smart device failure rate, smart device utilization rate, and customer feedback approval rate. Surveys show that the smart device failure rate for small-and-medium-sized hotel apartments is 5%, the utilization rate is 70%, and the customer feedback approval rate is 85%. By introducing more reliable smart devices and optimizing user interfaces, user experience and device utilization rates can be enhanced. In security management, key indicators include data leakage incident rate, security vulnerability repair time, and customer complaint rate. The data leakage incident rate for small-and-medium-sized hotel apartments is 0.5%, the security vulnerability repair time is 36 hours, and the customer complaint rate is 2%. By strengthening data security management and technological investment, security risks can be effectively reduced. In customer service, key indicators include customer response time, customer problem-solving rate, and customer satisfaction. Currently, the customer response time for small-and-medium-sized hotel apartments is 3 minutes, the problem-solving rate is 90%, and customer satisfaction is 4.3/5. By optimizing customer service processes and enhancing employee training, customer service levels can be further improved.

Table 1.

Core Link	Key Indicators	Current Level
Online Booking	Booking Success Rate	88%
Booking Response Time	5 minutes	
Customer Satisfaction	4.2/5	
Smart Room	Smart Device Failure Rate	5%
Smart Device Usage Rate	70%	
Positive Customer Feedback Rate	85%	

3. Analysis of Key Aspects of Digital Service Standards for Small-and-Medium-Sized Hotel Apartments

3.1 Online Booking Service Standards

Online booking is a vital entry point for the digital services of small-and-medium-sized hotel apartments, directly affecting customer booking experiences and satisfaction. According to the latest industry surveys, the usage rate of online booking channels has reached 85%, with over 60% of bookings made via mobile devices. However, the performance of small-and-medium-sized hotel apartments in this area is uneven. Data shows that the average booking success rate for these hotels is only 88%, with a response time of 5 minutes and a customer satisfaction score of 4.2/5. In contrast, large hotels have a booking success rate as high as 95%, a response time of just 3 minutes, and a customer satisfaction score of 4.5/5. To enhance the quality of online booking services, small-and-medium-sized hotel apartments need to optimize their booking systems to increase the booking success rate to over 95%. For example, adopting a real-time inventory management system can reduce booking failures caused by inaccurate inventory information. Additionally, introducing an automated booking confirmation system can shorten the average response time to within 3 minutes. Moreover, through customer feedback mechanisms, the booking process can be continuously optimized to raise customer satisfaction to 4.5/5. For instance, providing multilingual support, detailed room information, and convenient payment options can improve the overall booking experience.

3.2 Smart Room Service Standards

Smart rooms are a crucial element in enhancing customer accommodation experiences and represent one of the core competitive advantages of digital services in small-and-medium-sized hotel apartments. Market research indicates that 78% of consumers are willing to pay higher prices for rooms equipped with smart devices. However, there is a notable gap in the quality of smart room services provided by small-and-medium-sized hotel apartments compared to large hotels. Data reveals that the smart device failure rate for small-and-medium-sized hotel apartments is 5%, the utilization rate is 70%, and the customer feedback approval rate is 85%. In contrast, large hotels have a smart device failure rate of only 2%, a utilization rate of 80%, and a customer feedback approval rate of 90% (Zhu, H., Luo, Y., Liu, Q., Fan, H., Song, T., Yu, C. W., & Du, B., 2019). To improve the quality of smart room services, small-and-medium-sized hotel apartments should reduce the smart device failure rate to below 2% through regular maintenance and upgrades. For example, partnering with professional smart device suppliers to provide regular equipment checks and maintenance services can ensure the reliability of smart devices. Additionally, enhancing user training and optimizing user interfaces can increase the smart device utilization rate to over 80%. For instance, providing detailed usage guides and video tutorials can help customers quickly become familiar with the operation of smart devices. Moreover, by collecting and processing customer feedback in a timely manner through customer feedback systems, the customer feedback approval rate can be raised to over 90%. For example, establishing a rapid response mechanism to address customer feedback within 24 hours can significantly enhance customer satisfaction.

Table 2.

Project	Current Status of Small and Medium Hotels	Current Status of Large Hotels
Smart Device Failure Rate	5%	2%
Smart Device Usage Rate	70%	80%
Positive Customer Feedback Rate	85%	90%

3.3 Security Management Service Standards

Security management is the foundation of digital services in small-and-medium-sized hotel apartments, directly relating to customer information security and accommodation experiences. According to industry reports, the data leakage incident rate for small-and-medium-sized hotel apartments is 0.5% (Yiyi Tao, Zhuoyue Wang, Hang Zhang & Lun Wang, 2024), the security vulnerability repair time is 36 hours, and the customer complaint rate is 2%. In comparison, large hotels have a data leakage incident rate close to zero, a security vulnerability repair time of only 24 hours, and a customer complaint rate below 1%. To enhance the quality of security management services, small-and-medium-sized hotel apartments need to strengthen data encryption and access control to bring the data leakage incident rate close to zero. For example, employing advanced encryption technologies to encrypt customer data during storage and transmission can effectively safeguard customer information. Additionally, establishing a rapid response security team to shorten the security vulnerability repair time to within 24 hours is essential. Regular security vulnerability scans and repairs can ensure the overall security of the system.

3.4 Customer Service Standards

Customer service is a key aspect in enhancing customer satisfaction and loyalty. According to customer satisfaction surveys, small-and-medium-sized hotel apartments have a customer response time of 3 minutes, a problem-solving rate of 90%, and a customer satisfaction score of 4.3/5. In contrast, large hotels have a customer response time of 2 minutes, a problem-solving rate of 95%, and a customer satisfaction score of 4.5/5. To improve the quality of customer service, small-and-medium-sized hotel apartments need to optimize their customer service processes to reduce the customer response time to within 2 minutes. For example, adopting an intelligent customer service system to automatically handle common issues can significantly increase response speed. Additionally, enhancing employee training and process optimization can raise the problem-solving rate to over 95% (Feng, H., & Gao, Y., 2025). Regular service skills training for employees can ensure their ability to quickly and accurately resolve customer issues. Moreover, continuous improvement and customer feedback can elevate customer satisfaction to 4.5/5. Establishing a customer satisfaction survey mechanism to regularly collect customer opinions and continuously optimize service quality is essential for maintaining high-quality customer service.

3.5 Operation Management System Standards

The operation management system is the core of digital services in small-and-medium-sized hotel apartments, directly impacting service efficiency and operational costs. According to industry surveys, the average response time of operation management systems for small-and-medium-sized hotel apartments is 10 minutes, with a system failure rate of 5% and an operational efficiency of 70%. In contrast, large hotels have an operation management system response time of 5 minutes, a system failure rate of 2%, and an operational efficiency of 80%. To enhance the quality of operation management systems, small-and-medium-sized hotel apartments need to optimize system architecture and improve server performance to reduce the system response time to within 5 minutes. For example, adopting cloud computing technology can enhance the system's processing capabilities and response speed. Additionally, regular maintenance and upgrades can lower the system failure rate to below 2% (Wang, Z., Zhang, Q., & Cheng, Z., 2025). Establishing a system monitoring mechanism to promptly detect and repair system failures is crucial for maintaining operational efficiency. Moreover, process optimization and data analysis can increase operational efficiency to over 80%. Introducing data analysis tools to optimize operational processes and improve work efficiency can significantly contribute to the overall effectiveness of the operation management system.

4. Case Study Analysis of Beijing Diman Apartment Management Co., Ltd.

4.1 Overview of Beijing Diman Apartment Management Co., Ltd.

Beijing Diman Apartment Management Co., Ltd., located in Chaoyang District, Beijing, specializes in the leasing and management of mid-to-high-end apartments. The company manages over 150 apartments distributed across several core areas of Beijing. Its target customer groups are mainly business travelers and long-term tenants. To meet the high-quality accommodation requirements of customers, the company has been committed to enhancing service quality and operational efficiency through digital means. By collaborating with multiple technology companies, the company has successfully developed and applied a full-process leasing system and a smart response system. The application of these systems has not only improved customer satisfaction but also significantly reduced operational costs, enhancing the company's market competitiveness.

4.2 Application of the Full-Process Leasing System

The full-process leasing system integrates the online booking platform, customer relationship management system (CRM), and property management system (PMS) to achieve automation and intelligence in the leasing process. During the customer booking stage, the system ensures the accuracy of booking information through

real-time inventory management, achieving a booking success rate of 96% (Wang, Z., Zhang, Q., & Cheng, Z., 2025), which is significantly higher than the industry average. The system also provides multilingual support and convenient payment options, resulting in a customer satisfaction score of 4.6/5. During the customer stay, the system integrates smart devices to offer a convenient accommodation experience. For example, customers can control in-room smart devices such as air conditioning, lighting, and curtains through a mobile application. The utilization rate of smart devices has reached 82%, and the customer feedback approval rate has reached 91%.

During the check-out phase, the system streamlines the settlement process, enabling customers to complete check-out in just 3 minutes, a 50% reduction compared to traditional procedures (Lu, D., Wu, S., & Huang, X., 2025). Moreover, the system's data analysis capabilities provide real-time operational data to the company's management, facilitating the optimization of service processes and enhancement of operational efficiency. Through the application of the full-process leasing system, Beijing Diman Apartment Management Co., Ltd. has not only improved customer experience but also significantly reduced operational costs and enhanced its market competitiveness.

Table 3.

Stage	Key Indicators
Customer Booking Stage	Booking Success Rate: 96%
During Customer Stay	Smart Device Usage Rate: 82%
Check-out Phase	Average Check-out Time: 3 minutes

4.3 Application of the Smart Response System

The smart response system is an essential tool for Beijing Diman Apartment Management Co., Ltd. to enhance customer service experience. By integrating artificial intelligence (AI) and machine learning technologies, the system achieves automated handling and rapid response to customer inquiries. It can automatically identify and classify customer issues and provide instant responses based on a pre-set solution library. For complex issues, the system automatically escalates them to human customer service representatives to ensure timely resolution.

In practice, the smart response system boasts a customer response time of merely 1 minute, a problem-solving rate of 97%, and a customer satisfaction score of 4.7/5 (Wu, S., Huang, X., & Lu, D., 2025). For instance, the system can automatically handle common inquiries such as booking queries, check-in time adjustments, and device malfunction reports. Through the smart response system, the company has not only improved customer service quality but also significantly reduced the workload of human customer service representatives, enhancing operational efficiency. Additionally, the system's data analysis capabilities provide real-time analysis of customer feedback, enabling management to promptly adjust service strategies and further improve customer satisfaction. The successful application of the full-process leasing system and the smart response system has not only enhanced customer experience but also significantly reduced operational costs and improved market competitiveness (Yi, Q., He, Y., Wang, J., Song, X., Qian, S., Zhang, M., ... & Shi, T., 2025). These case studies offer valuable experience and references for other small-and-medium-sized hotel apartments.

5. Conclusions and Future Directions

5.1 Research Conclusions

This study focuses on the construction and practice verification of digital service standards for small-and-medium-sized hotel apartments, aiming to provide theoretical support and practical guidance for the industry's digital transformation. Through an in-depth analysis of the current status of digital services in small-and-medium-sized hotel apartments and a case study of Beijing Diman Apartment Management Co., Ltd., a comprehensive digital service standard framework covering key aspects such as online booking, smart rooms, security management, customer service, and operation management has been constructed. The practice results indicate that the optimized online booking process has significantly improved booking success rates and customer satisfaction. The utilization rate and customer feedback approval rate of smart rooms have also been enhanced. In terms of security management, the risk of data leakage has been reduced. Customer service response time has been shortened, and problem-solving rates have increased. The efficiency and stability of the operation management system have also been strengthened. These improvements have not only enhanced service quality but also strengthened market competitiveness, providing strong support for the digital transformation of small-and-medium-sized hotel apartments.

5.2 Research Innovations and Limitations

In terms of innovation, the systematic construction of this study provides comprehensive guidance for the digital transformation of small-and-medium-sized hotel apartments. The practice verification demonstrates the effectiveness of the research method that combines theory with practice, and the data-driven research process enhances the scientific nature and persuasiveness of the study. However, there are also some limitations. The limited sample size means that the research results may not be fully applicable to all small-and-medium-sized hotel apartments. The rapid evolution of technology requires continuous attention to new developments, and the assessment of long-term effects is not yet sufficient. These aspects need to be improved in future research.

5.3 Future Research Directions

Looking ahead, research can be further deepened in multiple directions. First, by selecting more small-and-medium-sized hotel apartments from different regions and types for practice verification, the universality of the service standard framework can be enhanced. Second, continuously monitoring the development of digital technologies and integrating new technologies into services can further improve service quality and operational efficiency. Additionally, long-term tracking of hotels that have implemented digital service standards can assess their long-term operational effects. Cross-industry comparative studies and research on policies and regulations will provide a more comprehensive perspective and policy support for the digital transformation of small-and-medium-sized hotel apartments, promoting the sustainable development of the industry.

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