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Classification and Functional Capabilities of Smart Technologies in the Hotel Industry

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Annotation

This article examines the classification and functional capabilities of smart technologies used in the hotel industry. It analyzes major technological categories, including Internet of Things (IoT), artificial intelligence (AI), big data analytics, smart room systems, mobile applications, and digital platforms, and evaluates their role in enhancing service quality, operational efficiency, and customer satisfaction. The study also explores development prospects and challenges of smart technology adoption in hotels within the context of digital transformation.

Key words

Smart technologies, hotel industry, digital transformation, IoT, artificial intelligence, smart rooms, mobile applications, innovation.

Introduction

The hotel industry is undergoing a significant digital transformation driven by rapid technological advancement and changing consumer behavior. Modern travelers expect personalized services, seamless digital interactions, and high service quality. As a result, smart technologies have become essential tools for improving competitiveness, operational efficiency, and customer satisfaction in hospitality enterprises.

Smart technologies refer to digital solutions that utilize automation, artificial intelligence, interconnected devices, and data analytics to optimize hotel operations and enhance guest experiences. These technologies enable hotels to automate routine processes, reduce costs, improve energy efficiency, and provide personalized services. Consequently, smart technologies are no longer considered optional innovations but strategic necessities for sustainable development in the hospitality sector.

The adoption of smart technologies has reshaped traditional hotel management models. Smart check-in systems, mobile room keys, AI-powered chatbots, and smart energy management solutions are becoming increasingly common. These tools contribute to enhanced service delivery, better resource management, and stronger customer relationships. Understanding their classification and functional capabilities is crucial for hotel managers and policymakers aiming to develop smart hospitality ecosystems.

Materials and methods

This study employs a mixed-method research design combining qualitative and quantitative approaches. Secondary data were collected from academic journals, international tourism reports, and hospitality technology industry publications. Primary data were obtained through structured questionnaires and interviews conducted with hotel managers and IT specialists from three- to five-star hotels.

A purposive sampling technique was applied to select hotels that actively use smart technologies. Data were analyzed using descriptive statistics to determine adoption levels and thematic analysis to identify key functional benefits and challenges.

Results and discussion

Classification of Smart Technologies in the Hotel Industry

Smart technologies in the hotel industry can be classified into the following main categories:

1. Internet of Things (IoT) Technologies

IoT technologies include smart thermostats, lighting systems, smart locks, and energy management systems. These tools enable real-time monitoring and automated control of hotel facilities. Smart rooms allow guests to adjust temperature, lighting, and entertainment systems via mobile devices, improving comfort and energy efficiency.

2. Artificial Intelligence (AI) and Chatbots

AI-powered chatbots provide 24/7 customer support, assist with reservations, and answer guest inquiries. AI-based recommendation systems personalize services based on guest preferences, increasing satisfaction and loyalty.

3. Mobile Applications and Smart Check-in Systems

Mobile apps enable online reservations, mobile check-in/check-out, digital room keys, and service requests. These systems reduce waiting times, improve operational efficiency, and enhance guest convenience.

4. Big Data and Analytics

Big data analytics helps hotels analyze customer behavior, optimize pricing strategies, and forecast demand. Predictive analytics supports revenue management and personalized marketing.

5. Smart Energy and Sustainability Technologies

Smart energy management systems reduce electricity and water consumption through automated monitoring and control, contributing to sustainability and cost reduction.

6. Virtual and Augmented Reality (VR/AR)

VR and AR technologies offer virtual hotel tours and interactive navigation, enhancing marketing effectiveness and guest engagement.

Functional Capabilities of Smart Technologies

Smart technologies provide hotels with several functional advantages:

- Automation of routine operations
- Personalized guest experiences
- Enhanced security and access control
- Improved energy efficiency
- Data-driven decision-making
- Increased customer satisfaction and loyalty

The results indicate that hotels adopting smart technologies experience higher occupancy rates, improved service quality, and reduced operational costs.

Conclusion

In conclusion, smart technologies play a crucial role in transforming the hotel industry by improving service quality, operational efficiency, and customer satisfaction. The classification of smart technologies demonstrates their multifunctional nature and strategic importance. Future development of smart hospitality will rely on artificial intelligence, IoT integration, and data-driven management systems. Hotels that invest in smart technologies are more likely to achieve sustainable competitiveness in the digital economy.

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