A Review of Current Trends in Smart Room Technology within the Hotel Industry in India

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Abstract

This review paper provides an in-depth analysis of the burgeoning smart room trends within the hotel industry in India. As technology continues to advance at an unprecedented pace, hotels in India are increasingly integrating smart technologies into their guest rooms to elevate the overall guest experience. The paper explores key smart room technologies, including automation systems, mobile integration, and personalized services, shedding light on their impact on guest satisfaction and operational efficiency. By examining case studies and addressing challenges such as cost implications and data security concerns, the paper offers valuable insights into the current state of smart room adoption in India. Furthermore, it delves into the future trajectory of these trends, anticipating potential advancements and their implications for both hoteliers and guests. This comprehensive review contributes to a deeper understanding of the evolving landscape of smart room technologies in Indian hotels, providing a foundation for future research and strategic industry developments.

Keywords: Smart room, hotel technology, hospitality industry, guest experiences.

Introduction

Technology has influenced every business, including travel and hospitality. The emergence of technological innovations has influenced the hospitality industry in a variety of ways, but the addition of modern amenities has brought this transition to a new level. Hotels are providing technical conveniences such as keyless access, electronic lockers, smart rooms, smart mirrors, and so on, which is producing a new type of enjoyment for the tech-savvy generation of visitors.(Verma & Thakur, 2022).The hotel industry's digital transformation begins with transforming the room idea using the latest technology. Enter the smart room, a cloud-based system with IoT devices that allows visitors to control their experience via a mobile device, generally an in-room tablet. More particular, guests have discretion over a variety of facilities and guest services. This includes lighting, air conditioning, and media devices in each room via several IoT sensors, as well as chat with concierges, hotel restaurant reservations, and fast access

to travel itineraries.(Bhat, 2020)The digitization of rooms is crucial for improving the guest's experience. Allowing guests to control the room temperature with their smartphones creates a personalised environment. A renowned hotel brand implemented a virtual caretaker to quickly address guest requirements. Investing in improving the in-room experience leads to happy visitors and recurring business for hotels. Gesture-controlled interactive walls and mirrors are becoming increasingly popular in the hotel business.(Developments in the Hospitality Industry – An Overview of Tamil Nadu Hotels, 2019).Guests may now compare hotel rooms, services, ratings, and rates before travelling to their location. This is only feasible through digital innovation. Consumers now have convenient access to everything because to portability and accessibility. The introduction of smartphones and tablets has altered the method.(Kanekar, 2020) Innovation is vital for both survival and long-term profitability.(Cooper, Edgett, & Kleinschmidt, 1999).

Background

Smart rooms make use of technology to better meet the demands of guests. The smart room concept originated in multinational businesses worldwide. AI (Artificial Intelligence) is applied in the room to give guests with specialised services. Smart rooms now include voice commands, auto lighting, censors, mobile applications, and other features. Is the hotel meeting visitor expectations in light of technological advancements? This research will enhance our understanding of smart room concepts, guest preferences for smart room amenities, and the comparison between traditional and smart rooms.(Tyagi & Patvekar, 2019).

Hotels use in-room technology to enhance guest comfort and safety. In-room technology include electronic locks and safes, alarm clocks, personal computer entertainment systems, temperature control systems, fire alarms, security systems, and minibars.(Collins & C, 2008)

In 2014, keyless access became the first innovation, followed by wearables, robotics, and virtual reality. Hoteliers are increasingly utilising custom coffee machines, digital mirrors, smart floor tiles, and remote control for services like blinds, alarm clocks, and TVs.

The rise in popularity of air travel in the 1960s prompted the development of GDS. This marked the beginning of dynamic pricing and a portal where agents could view inventories. The underpinnings of today's online travel agencies.The Intercontinental Group first added vending and ice machines on floors in 1966.Many systems such as micros and room keys, were developed in the 1970s.Between 1973 and 1976, hotels integrated films and popular paid-for TV subscriptions such as HBO as part of the guest experience in years 1973 to 1976.Teledex has been set up for room service, calls from rooms to connect with home while in the hotel during the years of 1982-1986. The original Teledex phone, the Teledex Diamond, is the most popular model on the market. Since then, over 15 million Teledex-branded hotel phones have been deployed in 125 countries.This transition opened the door for smartphone technology, which many hotels now utilise to provide an enhanced guest experience, such as Handy, which allows you to explore your local region, access the internet, and even contact home without using your own data. Handy was rapidly superseded by our own mobile technology, which included free roaming and WiFi.

Methodology

The aim of this chapter is to review the research on Smart room technologies and trends in Smart room technology in hotel industry in india. Following that, a review of the literature on the existing knowledge on smart room technology in the hotel industry is performed. This involves reviewing academic articles, industry reports, conference papers, and relevant books and then Identification of key themes, trends, and gaps in the existing literature has been done. To support the title, this study takes an exploratory research technique and accumulates information from secondary sources. Given the limited amount of available publications, it was chosen to conduct a narrative review of a number of prominent journals in the field.

Smart Room Technology Components

- **IoT Devices:** IoT applications in hotels include smart room service, automated check-in/out, room automation, and smart upkeep. Hotels are using key applications, such as electronic key cards given to guests' phones for room access.Hilton and Marriott hotels are exploring smart guestrooms with personalised experiences and voice-activated gadgets that respond to guests' preferences. Virtual assistance interfaces engage visitors and improve their stay experience. (Sharma & Gupta, 2021)
- **Automation Systems:** Hotel automation systems have evolved from single-modality systems that only manage HVAC and lighting to multi-modality systems that coordinate communication, entertainment, safety, security, HVAC, lighting, and electricity consumption to enhance guest comfort and energy efficiency. (Verma & Jain, 2016)
- **Voice Control and AI:** In-room voice-activated systems frequently minimise staff costs while also providing 24-hour coverage. They can eliminate service friction, allowing workers to devote more time to improving visitors' experiences. Because in-room voice-based digital assistants are part of Internet of Things (IoT) systems, they are seamlessly connected with hotel amenities and back office operations. This enables workers to keep continually updated about customers' demands and experiences, respond quickly, and efficiently forward messages to relevant departments when service requests or complaints are found, utilising contextual and real-time information. The primary benefit of voice assistants for hotels, according to the majority of technology suppliers, is process automation. Participants determined the potential benefits of workflow automation. (Buhalis & Moldavska, 2021)

Guest Room Technology Trends in India

Technology is growing at a quicker rate than ever before, transforming both customer expectations and how businesses engage with them. The hospitality sector is no different, and despite being perceived as a late user of technology, hoteliers are constantly looking for the newest advancements to boost operational efficiencies and client pleasure.(Singh, Sharma, & Kapoor, 2023)Technological advances have impacted many aspects of the hotel industry, including in-room hotel technologies. With guests ranging from techno-yuppies to seasoned experienced travellers who loathe remote controls, rooms must now be user-friendly and accessible for a variety of digital devices and expectations.(Stylos, Fotiadis, (Don) Shin , & Tzung, 2021)

- Room Service Applications
- In room Beverages on Demand
- Personalized attention via social media connectedness.
- HD Voice Operated and Touch Screen temperature sensors
- Hotel offers staff video chat service without use of Applications.
- Service Robots
- Smart bathrooms in Guestroom
- Interactive TVs and In-Room Tablets
- Smart energy management
- customised showers According to body temperature

Room Technology Advancement Case Studies in Indian Hotels

It's essential to note that the adoption of smart hotel room technology can vary among different hotel chains and individual properties.

- **ITC Hotels, India:** ITC Hotels in India is known for incorporating advanced technology in its hospitality services. They have implemented smart room features such as automated lighting, climate control, and in-room entertainment systems. These technological enhancements aim to provide guests with a more personalized and convenient experience during their stay.(Prabhu, 2018)
- **The Park, Hyderabad:** The Park Hotels, with locations in various Indian cities, including Hyderabad, has been at the forefront of adopting modern technology. They have integrated smart room controls allowing guests to manage lighting, temperature, and other room features through a centralized system. This not only enhances guest comfort but also contributes to energy efficiency.
- **Marriott Hotels, India:** Some Marriott properties in India have introduced smart room technology, allowing guests to use their smartphones to control various aspects of their room, such as lighting and temperature. Marriott has been globally investing in technology to enhance the guest experience, and this is likely reflected in their Indian properties as well.(Balani, 2023)
- **Taj Santacruz, Mumbai:** The Taj Santacruz in Mumbai is known for its luxurious accommodations and has incorporated technology to enhance the guest experience. Smart room features may include automated curtains, in-room tablets for control, and personalized services to meet individual preferences.
- **Lemon Tree Hotels:** Lemon Tree Hotels in India have been recognized for adopting technology to improve guest services. They may incorporate smart controls for lighting and room temperature, along with other features aimed at providing a seamless and modern hospitality experience.(Goel, 2015)

Future Outlook

Hoteliers in India are likely to continue embracing innovations that enhance guest comfort, improve operational efficiency, and align with global hospitality trends.

➢ **Integration of Artificial Intelligence (AI):** Future smart hotel rooms in India may leverage AI to provide more personalized and anticipatory services. AI-powered virtual assistants, for example, could understand guest preferences and adjust room settings, recommend services, or provide local information.

➢ **Voice-Activated Controls:** Voice-activated technologies, such as virtual assistants (similar to Amazon's Alexa or Google Assistant), may become more prevalent. Guests could control various room features, request information, or make service requests using voice commands.

➢ **Enhanced Security Features:** With a growing emphasis on security and privacy, smart hotel rooms may incorporate advanced biometric technologies for access control, ensuring a secure and seamless experience for guests.

➢ **IoT (Internet of Things) Ecosystems:** The integration of IoT in smart hotel rooms is likely to expand. This could include smart sensors and devices communicating with each other to optimize energy usage, enhance room customization, and enable more maintenance that is efficient.

➢ **Augmented Reality (AR) Experiences:** AR could be utilized to enhance the guest experience. For example, guests might use AR applications on their smartphones or AR glasses to access information about hotel facilities, nearby attractions, or even receive virtual tours of the hotel.

➢ **Contactless Technology:** The COVID-19 pandemic has accelerated the adoption of contactless technologies. Future smart hotel rooms may continue to focus on minimizing physical touchpoints through mobile check-ins, digital keys, and touchless controls for lights, thermostats, and entertainment systems.

➢ **Environmental Sustainability:** Smart room technology in hotels is likely to align with sustainability goals. Energy-efficient systems, waste reduction through smart controls, and eco-friendly practices may become integral to the design and functionality of smart hotel rooms.

➢ **Personalized Experiences through Data Analytics:** Hotels may increasingly use data analytics to understand guest preferences and behaviors. This information could be used to personalize the in-room experience, from preferred room settings to targeted recommendations for services and amenities.

➢ **Blockchain for Security and Transparency:** Blockchain technology may find applications in enhancing the security of guest data and transactions. It can provide a transparent and tamper-proof system for managing reservations, payments, and loyalty programs.

➢ **Robotic Assistance:** While not limited to smart room technology, hotels may integrate robotic assistance for services such as room service delivery, housekeeping, or concierge services, providing a unique and futuristic touch to the guest experience.

Conclusion

The emergence of smart hotels will surely have an impact on the future of the hospitality sector. Hotels may stand out in an increasingly competitive market by using new technology such as AI-driven personalisation, virtual reality-enhanced experiences, blockchain-based loyalty programmes, robotic help, and sustainable practices. These technologies have the ability to not

only transform the visitor experience, but also redefine how hoteliers manage and run their companies.

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