INDONESIAN JOURNAL OF SOCIAL AND ENVIRONMENTAL ISSUES (IJSEI)
Journal Homepage: https://ojs.literacyinstitute.org/index.php/ijsei
ISSN: 2722-1369 (Online)
Research Article

Volume 4	Issue 2	August (2023)	DOI: 10.47540/ijsei.v4i2.1009	Page: 184 – 191

Guest Pro-environmental Behavior Towards the Implementation of Energy Efficiency through Smart Key Technology in Capsule Hotel

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ARTICLE INFO

Keywords: Capsule Hotel; Energy Efficiency; Guest Pro-environmental Behavior.

Received : 29 July 2023
Revised : 24 August 2023
Accepted : 26 August 2023

ABSTRACT

The purpose of this study was to determine guest pro-environmental behavior on the application of energy efficiency in capsule hotels with case studies in Bobobox Indonesia and Digital Airport Hotel. The method used in this research is qualitative analysis. The samples used were two capsule hotel management informants in Indonesia, namely Bobobox Indonesia and Digital Airport Hotel. The method used is purposive sampling. Data collection techniques in this study were carried out by online interviews through Zoom meetings and observations. Based on the results of data analysis, it can be concluded that the implementation of energy efficiency through smart key technology in capsule hotel improves the pro-environmental behavior of the guests. It can be observed through the willingness of guests to use the smart key technology implemented by the company. This study contributes to the field by exploring the impact of energy-efficient measures, particularly through the implementation of smart key technology, on guest pro-environmental behavior in the hospitality industry. The findings offer valuable insights for both businesses aiming to enhance sustainability in accommodations and travelers seeking to make eco-conscious choices while on the move.

INTRODUCTION

The hotel industry has a significant impact on energy consumption and the environment, contributing to local and regional pollution, as well as global issues such as global warming and climate change. Energy efficiency and energy-saving practices are important in the hotel industry to reduce energy consumption and save on costs. The hotel industry's energy footprint, represented by 20% of energy costs and carbon emissions, highlights the sustainability risks associated with the increasing number of energy-efficient accommodations (Machete, 2015). Lighting, water heating, and thermal control in rooms are the most common primary energy users in the hotel industry (Sun International, 2012).

The hotel industry consumes large amounts of energy, water, and other non-renewable resources, and contributes 2-5% of global CO2 emissions. Increasing energy efficiency and practicing energy-saving is important for reducing energy consumption and saving on costs in the hotel industry. Sustainability is a main target in many industries, including tourism and hospitality (Shen et al., 2020), and there are various efforts for the hotel industry to improve energy-saving practices. These practices not only benefit the company by reducing operational costs, but also improve guest comfort, increase the aesthetic value of the hotel, and reduce the possibility of system maintenance failures.

The primary objective of these sophisticated systems designed for the hospitality sector is to enhance the effectiveness of resource management and elevate the guest experience. This aims to increase the competitiveness of organizations and ensure consumer satisfaction, all while maintaining sustainability over a long time (Buhalis and Amaranggana, 2015). These technologies within the realm of FIR have a significant impact not only on the competitive landscape of hospitality enterprises but also on tourists and their overall experience (Huang et al., 2017). In the context of sustainable progress, it is important to emphasize an equitable

focus on both the environment and the tourism industry, such as hospitality (Senic et al., 2018). To align with environmentally friendly practices, hotels can embrace the ecological movement by adopting automation facilitated by the Internet of Things (IoT) to reduce energy usage (Maglovska & Dimitrov, 2020). Various new automation technologies, such as IoT, can provide hotel staff with important data and alerts to manage energy consumption and support sustainability efforts in the hotel industry. IoT can enable more efficient energy use through smart devices and energy-saving systems (Youssef & Zeqiri, 2020).

The energy-saving system that is being studied is the smart key used by capsule hotels, specifically two types: keyless entry system technology and electronic keycards. These technologies have been identified by hotel business operators in New Zealand as leading to energy savings. The keyless entry system is a relatively new and innovative solution that allows guests to access rooms without using physical keys or electronic key cards. These smart keys can be used as a smart energy management system that is directly connected to electricity, increasing energy-saving practices in the hotel industry. The use of smart energy management systems can reduce hotel energy costs by 20-25% according to Eskerod et al. (2019).

An Energy Management System (EMS) is a system that combines monitoring and control capabilities to efficiently manage energy usage in a controlled environment. It can automatically control lighting and temperature to optimize energy efficiency. Intelligent energy management software is used to monitor and optimize power generation and transmission systems, reducing energy consumption and costs. Wireless energy management solutions, like keycard systems, control lighting, HVAC, and other devices in hotels, enable remote monitoring and control for energy savings and customer comfort.

Bobobox is an example of a capsule hotel in Indonesia that uses smart keys for keyless entry. The Bobobox application controls all the facilities of the hotel, including lighting, AC temperature, access keys, and speakers. Capsule hotels are a type of budget hotel accommodation concept that provides small, unique, and backpacker-friendly rooms. The concept of capsule hotels first appeared in 1972 in Tokyo, Japan, and was initially aimed at Japanese workers who had to work overtime and needed a safe place to stay. Recently, capsule hotels have become popular in Indonesia, targeting domestic and foreign tourists or backpackers looking for cheap accommodation. Some modern and digitalized capsule hotels in Indonesia use smart keyless entry systems and electronic key cards and have a spaceship theme with technology-based facilities as a special attraction for customers.

Smart Key technology, including smartphone-based keyless entry systems and electronic keycards, is becoming integral to our daily lives. In the hotel industry, smartphones are used for various functions such as check-in, making reservations, ordering room service, and keyless entry, providing guests with familiarity and convenience. This technology reduces the need for additional hardware and lowers technology upgrade costs for hotels. The digital room key sent to guests' devices streamlines check-in and enhances connectivity, personalization, and proactivity in the modern networked era. Additionally, electronic keycards provide secure access to specific doors for a designated time, offering privacy benefits over traditional physical keys.

According to Amornpornwiwat and Kapasuwan (2018), capsule hotels, with their limited space and controlled lighting systems, can increase energy conservation and attract greater interest in sustainable consumption in the tourism industry. Green mindfulness, a state of consciousness where individuals are aware of environmental issues and their involvement in resolving them, can also be fostered in hotels. Society's increasing awareness of the importance of environmentally friendly and energy-saving efforts is leading more hotel guests to seek out hotels with these practices.

Sustainable hotels consider environmental, economic, and social consequences in their operations. Capsule hotels promote sustainability through compact size, energy conservation, and innovative technologies. Energy efficiency is crucial for reducing costs and carbon footprint. Factors driving hospitality businesses to invest in energy efficiency include geoclimatic conditions, socio-economic characteristics, and specific HVAC attributes. Indicators of energy efficiency include energy management, reduction of heating and cooling needs, and equipment efficiency.

Pro-environmental behavior (PEB) refers to actions that support the well-being of nature and the environment. In the context of hotels, PEB can include recycling, energy and water conservation, and other sustainable practices. Factors influencing PEB include external aspects like social norms and convenience, as well as internal factors like demographics and psychological variables. Researchers have identified four indicators of PEB: social environmentalism, land stewardship, conservation lifestyle, and environmental citizenship, which encompass actions from personal lifestyle choices to social and political engagement for environmental causes.

This research aims to raise sustainable behavior among hotel guests towards the implementation of energy efficiency in capsule hotels using smart key technology.

MATERIALS AND METHODS

The qualitative approach was chosen because it allows for a deeper exploration of real-world practices, such as energy efficiency practices. A sample is a portion of the quantity and characteristics possessed by a population. This study employs purposive sampling for in-depth interviews in the study aimed at achieving the predefined goals. During the process of gathering data, the researchers conducted interviews with two informants, specifically the managers of Capsule Hotels in Indonesia, the specific determined research locations are Bobobox Indonesia and Digital Airport Indonesia. These individuals were chosen intentionally, with the researchers ensuring that they possess the capability to provide answers to the researchers' inquiries.

Interviews were conducted between March 2021 and December 2021, implemented in online interviews by one-on-one Zoom Meeting. This approach aimed to provide safeguard the confidentiality of both informants and researchers. This setting allowed informants to freely express their thoughts and opinions without feeling intrusive or pressured.

The data obtained from these interviews were transformed into diary entries and subsequently transcribed. The collected interview data was then manually analyzed through processes like coding, categorization, identifying themes, and creating memos (Saldana, 2016). The final phase of the study involved compiling the research findings based on the outcomes of the data analysis. The validity of the data is ensured through triangulation and inductive methods, and the results focus on understanding the meaning behind the phenomena.

RESULTS AND DISCUSSION

The findings of this study shed light on the evolving landscape of capsule hotels in Indonesia, particularly in terms of energy efficiency and guest pro-environmental behavior. The study examined several key players in the industry, including Bobobox Indonesia, PT. Capsule Indonesia, Jakpod Hotel, Digital Airport Hotel, Tab Capsule Hotel Kayoon, and KINI Luxury Capsule.

In Indonesia, capsule hotels first appeared in 2017 and initially followed the same layout as capsule hotels in Japan, with doorless boxes stacked in a room and containing only a single-sized bed and one pillow. However, as time progressed, capsule hotels in Indonesia started to implement digitization in their pods, such as adding more facilities, adopting spaceship themes, using electronic key cards, and implementing keyless entry systems using QR codes. Bobobox Indonesia was one of the pioneers in this field and is one of the many capsule hotel business players in Indonesia, along with companies like PT. Capsule Indonesia, Jakpod Hotel, Digital Airport Hotel, Tab Capsule Hotel Kayoon, and KINI Luxury Capsule.

Bobobox is a technologically advanced capsule hotel brand in Indonesia that was founded by Indra Gunawan and Antonius Bong. Since 2018, it has been offering travelers a unique accommodation experience in 15 locations throughout Indonesia, with advanced beds at affordable prices. Each pod is designed for maximum comfort and equipped with the latest technology, all controlled through the Bobobox mobile app. The app allows users to access various facilities, eliminating the need to report to the receptionist. Bobobox aims to define a new category in "demand-based sleeping" and appeals to two main markets: business travelers and backpackers aged between 25 and 40. The futuristic and insta-worthy pods are equipped with door access controlled by the app, a tablet that serves as a control center, a Bluetooth speaker, charging slots, security, a king-sized bed, a compact workspace, and private AC. Each pod is carefully designed to

enhance the experience, comfort, privacy, space, and value of guests. With their pods and business model, Bobobox addresses the issues of space, security, and affordability that occur in regular budget accommodations. In May 2020, Bobobox secured USD 11.5 million in Series A funding from new and existing investors.

Digital Airport Hotel is a capsule hotel located in Terminal 3 of Soekarno-Hatta Airport in Indonesia. The hotel offers transit rates for stays as short as 6 hours and has won a 2018 Guest Review Award for its high customer satisfaction. The hotel features 120 capsule-shaped rooms with modern and futuristic designs and amenities, including access cards, high-quality beds, private lockers, and shared bathrooms. In 2020, the hotel expanded to Terminal 2 and introduced a room box, a larger version of the capsule room that can accommodate 2-3 people.

In this research, data collection is carried out with the aim of understanding and answering the problem formulation of guest pro-environmental behavior towards the implementation of energy efficiency through smart key technology in capsule hotels. Data collection is conducted using the methods of interview, observation, and documentation. Data collection through interviews was conducted online through the Zoom Meeting application, observations were carried out indirectly through several videos on YouTube, and documentation was also done indirectly through the official website of some relevant capsule hotels. The interview process involved two informants who provided their views and answers on energy efficiency in capsule hotels. During the interview, the researcher first explained the purpose and meaning of the research being conducted.

As a result, the results of the interview from each informant have been summarized:

1. Collaboration with Youth in the Context of Conservation in Capsule Hotels

This research focuses on the collaboration between capsule hotels and youth in the context of conservation, specifically in promoting pro-environmental behavior. Traditionally, conservation efforts have relied on information dissemination to increase awareness and knowledge. However, the study highlights the involvement of young people in capsule hotels, as stated by Mr. Indra Gunawan, the CEO of Bobobox Indonesia. It is noteworthy that the very foundation and technological advancements of Bobobox stem from the creative minds of young talents working within the company. This highlights the active involvement of young people in Indonesia in championing environmental preservation. The initiation and evolution of capsule hotels' concepts and technology showcase the determination of the younger generation to actively participate in environmental conservation endeavors.

Ms. Pauline, a Sales and Marketing Staff member, further supports the collaboration with young staff members. She mentions the shared bathroom concept, emphasizing the need for guests to be mindful of water usage. The hotel provides a refillable water gallon instead of individual bottles, promotes the reuse of sweaters, and discourages wasteful practices to minimize environmental pollution.

In essence, the research demonstrates the pivotal role of the youth in reshaping the environmental landscape of the hospitality industry. Through creative contributions and strategic initiatives, young individuals are actively leading efforts to promote pro-environmental behavior and foster sustainability within capsule hotels. This collaborative synergy between the youth and capsule hotels serves as an inspiring model for a more environmentally conscious future in the hospitality sector.

2. Energy and Water Conservation in Capsule Hotels

The exploration into energy and water conservation practices within capsule hotels has unveiled a series of commendable efforts toward sustainability and environmental responsibility. Drawing from the perspective of Barber and Dale (2014), sustainable hotels are those that meticulously consider the environmental consequences of their actions, encompassing water and energy savings, environmentally friendly procurement strategies, and reduction of emissions and waste production. The pressing concern of high energy consumption in hotels, where electricity reigns as the predominant energy source for diverse services, accentuates the urgency of adopting energy-efficient measures. Moreover, within the hotel industry, water preservation is pivotal, with water-saving practices embodying a conscientious approach toward the environment.

In an interview with the management of Bobobox Indonesia, energy and water conservation measures were discussed. The capsule design of the hotel allows for more efficient use of space and reduces the need for multiple air conditioning units, making it 75% more economical in terms of electricity compared to conventional hotels. The hotel also employs a shared bathroom concept with a 1:5 ratio for showers, ensuring efficient water usage since guests can predict and optimize their bathroom time.

The conservation efforts at Bobobox Indonesia extend to other aspects as well. The hotel utilizes LED lights, which are energy-efficient and contribute to electricity savings. They provide water dispensers for guests to refill their bottles, reducing the consumption of single-use plastic bottles. Additionally, the hotel offers reusable sweaters to minimize waste and pollution.

Notably, the utilization of LED lights within the capsule spaces underscores energy conservation, with their ability to substantially reduce electricity consumption compared to conventional incandescent lights. The inherent compactness of the capsules further bolsters energy efficiency, necessitating less AC power compared to larger, traditional hotels. The shared bathroom facilities in capsule hotels serve as a strategic mechanism for promoting water conservation. By curbing the number of available bathrooms, guests are prompted to exercise mindfulness in their water usage.

Collectively, the conservation endeavors embraced by capsule hotels underscore their unwavering commitment to sustainability and environmental accountability. From LED lighting adoption to ingenious space utilization and shared bathroom concepts, these measures not only align with the ethos of energy and water preservation but also exemplify a pioneering stance in responsible hospitality. The findings accentuate capsule hotels' pivotal role in championing eco-friendly practices within the broader hospitality landscape.

3. Other Lifestyle Behaviors in Capsule Hotels

The guest behavior in a capsule hotel is influenced by their decision-making process regarding the allocation of resources towards consumption-related items. This includes choosing, purchasing, using, or disposing of products, services, ideas, or experiences to meet their needs and desires. The guests' knowledge about the environment also impacts their lifestyle behavior, particularly in terms of environmentally friendly choices.

In a capsule hotel, guests primarily use the rooms for sleeping and resting, as stated by Mr. Indra Gunawan. This is especially true among millennials who prioritize the hotel room as a basic necessity. However, the pandemic has reshaped the landscape, giving rise to an upsurge in long-stay guests, encompassing those who require proximity to their workplaces or engagement in work-related activities. To address this trend, capsule hotels have adapted by providing dedicated workspaces, recreational zones, and dining facilities, enhancing the overall guest experience. To maintain a serene atmosphere, headsets are extended to patrons, allowing them to indulge in TV entertainment without encroaching on the tranquility of others, given that the pods lack soundproofing.

Moreover, the versatility of capsule hotels as havens for brief respites during travel is notable. Business travelers and tourists gravitate towards capsule rooms, driven by their cost-effectiveness and convenience, particularly when these establishments are conveniently situated within airport premises. This strategic placement eradicates the need for arduous journeys in search of suitable rest stops, ultimately saving invaluable time before flights. These rooms, famed for their comfort, present a pragmatic solution for individuals contending with missed flights or tight schedules.

Evidently, the preferences and actions of guests within capsule hotels are intricately molded by an amalgamation of determinants, spanning from hotel regulations to the balance of affordability and convenience. Guest behavior is profoundly shaped by the assortment of tailored amenities catering to individual needs, cementing capsule hotels as dynamic spaces that cater to a diverse range of lifestyles and circumstances.

4. Consumption or Environmentally Friendly Purchasing in Capsule Hotels

The hotel industry has significant environmental impacts due to its daily resource consumption, such as energy and water, as well as the generation of solid waste. However, there are efforts within the industry to implement environmentally friendly practices. Mr. Indra

Gunawan, for example, discusses some of these practices in the capsule hotel he manages.

Technological advancements are utilized to improve energy efficiency. A stand-by mode is implemented in unoccupied rooms to reduce electricity usage. In terms of housekeeping, rooms are cleaned only upon guest request, encouraging guests to consider water conservation for laundry and other purposes.

The hotel also adopts sustainable purchasing practices. The use of electric glass or smart glass eliminates the need for washing curtains or roller blinds, reducing water consumption. Automation through technology, such as QR codes, allows staff to focus on providing excellent service while automating tasks. These practices make the hotel more independent and appealing from an investment perspective.

In terms of reservations, the Bobobox application eliminates the use of paper. The traditional process involving paper and ink, such as registration and photocopying of ID cards, is eliminated. The room key itself is made of plastic, further reducing the need for paper.

Collectively, the hotel industry is cognizant of its environmental impacts and diligently deploys a spectrum of measures to curtail resource consumption, limit waste generation, and reduce dependence on paper-centric processes. This conscientious approach resonates with the broader movement toward sustainability, solidifying the industry's commitment to fostering a greener tomorrow.

Drawing from the insights gleaned from in-depth interviews conducted with informants representing two different capsule hotels, a noteworthy trend emerges. The examined capsule hotel companies are actively engaging with today's young demographic to foster energy and water conservation. This collaborative approach underscores a concerted effort to channel the enthusiasm and innovative mindset of the youth toward sustainable practices.

In parallel, the active participation of capsule hotel guests significantly contributes to the overarching environmental conservation endeavors of these establishments. Notably, guests' conscientious choices, such as refraining from daily pod cleaning requests, effectively curtail the usage of housekeeping resources. Further commendable practice is the recurrent employment of towels, blankets, and linens, a gesture that harmonizes with the eco-friendly ethos embraced by capsule hotels.

Remarkably, it becomes evident that guests primarily utilize the pods exclusively for sleep-related purposes during their accommodation period. This deliberately synchronized conduct acts as a central impetus bolstering their support for energy-efficient initiatives. As guests step outside their pods, power consumption becomes inconsequential due to the utilization of electricity in standby mode. It's worth highlighting that the findings from the interviews shed light on the fact that guests predominantly employ their capsule rooms for sleeping, leading to negligible electricity usage throughout their stay.

These insights reflect the strategic application of energy management systems, as elucidated by Maglosvka and Dimitrov (2020). This approach harnesses innovative keycard systems to regulate lighting and temperature, optimizing energy savings. As substantiated by interview responses, both hotel management and guests converge in endorsing this energy-saving strategy, which manifests a tangible partnership towards sustainability within the capsule hotel context.

CONCLUSION

The implementation of energy efficiency through smart key technology in capsule hotels increases pro-environmental behavior among guests. This is seen through the willingness of guests to use the smart key technology implemented by the company. Guests who do not have pro-environmental behavior need more education, especially from the hotel. However, guests who already have a high pro-environmental behavior, with an understanding of energy efficiency and the direct implementation of it, will automatically reduce complaints when there are problems related to energy. Guests with high pro-environmental behavior when staying have more awareness and attention to energy use, especially because the amount of energy consumed by the hotel industry, in general, is very large. Therefore, capsule hotels are usually used by guests only for sleeping or resting, so the energy usage from within the pods themselves is smaller because the pods are not activated by a QR code or electronic key card. Smart keys implemented by capsule hotels force

guests to have pro-environmental behavior consciously or unconsciously. Guests unconsciously will begin to understand the long-term effects offered using smart keys, for example in terms of electricity savings.

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