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Greening Hospitality: The Transformational Impact of Environmental Initiatives and Customer Eco-Pressure on Operational Excellence in Malaysia

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Abstract

The growing global emphasis on sustainability has led to an increasing integration of eco-friendly practices in various industries, including hospitality, where understanding how environmental initiatives and eco-friendly customer pressure influence operational performance has become essential for businesses aiming to remain competitive. This study examined the impact of environmental initiatives and eco-friendly customer pressure on operational excellence in Malaysia's hospitality sector. As sustainability became a global trend, understanding how green practices influenced operational performance was essential for businesses aiming to remain competitive. The research employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyse data from 288 respondents, offering a comprehensive view of how various environmental practices affected operational outcomes. The findings revealed that environmental performance incentives, green product innovation, and eco-friendly customer pressure significantly influenced operational performance. Environmental performance incentives were found to improve operational performance by encouraging more efficient, sustainable practices. Green product innovation emerged as a main factor, positively impacting operational performance by promoting creativity and differentiation through environmentally conscious offerings. Additionally, eco-friendly customer pressure was identified as a critical driver, with increasing consumer demand for sustainability pushing businesses to enhance operational practices. These results have both practical and theoretical implications. Practically, they emphasised the importance of integrating environmental initiatives into operations, showing that sustainability could improve operational performance, customer satisfaction, and competitive advantage. Theoretically, the study enriched the literature by providing empirical evidence of the connection between environmental initiatives and operational excellence in Malaysia's hospitality industry. This research offered valuable insights for practitioners and researchers exploring the relationship between sustainability and business performance. Ultimately, the study suggested that hospitality businesses must not only meet but also anticipate customer demands for eco-friendly practices to ensure long-term success and contribute to broader environmental goals.

Keywords: Environmental Initiatives; Operational Performance; Hospitality Sector; Green Product Innovation; Eco-Friendly Customer Pressure

1. Introduction

In recent years, the hospitality industry has experienced a transformative shift driven by the global call for environmental responsibility and sustainability (Ashton, 2018; Khatter, 2023; Ngelambong et al., 2016). As concerns about climate change intensified and consumer awareness of ecological issues grew, hotels around the

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world, including those in Malaysia, came under increasing pressure to implement sustainable practices. These efforts were not only part of their corporate social responsibility but also served as a strategic approach to remain competitive. Within this context, various sustainability-driven efforts such as environmental performance incentives, green product innovations, and responses to eco-conscious customer demands have emerged as key components of hotel management strategies (Hussein et al., 2024). These approaches are often believed to enhance not only environmental stewardship but also internal operational performance, offering potential benefits such as cost reduction, improved resource efficiency, and strengthened brand reputation (Singh et al., 2022).

The rapid growth of Malaysia's tourism sector further underscores the urgency of sustainable hotel practices. Tourist arrivals reached a pre-pandemic peak of 26.1 million in 2019 but dropped to 4.3 million in 2020 due to COVID-19 before gradually recovering to 18 million in 2023 (Tourism Malaysia, 2024). Alongside this surge, hospitality-related environmental pressures have mounted, with hotel waste generation rising from 120,000 tonnes in 2015 to 135,000 tonnes in 2019 and rebounding to 120,000 tonnes in 2023, while water consumption per establishment has mirrored similar patterns (DOE Malaysia, 2024). These trends, illustrated in Figure 1, demonstrate a tangible link between tourism activity and environmental impact, reinforcing the need to examine how sustainability practices influence operational outcomes in the hospitality sector.

However, despite their growing adoption, questions remain regarding the actual operational impacts of these green practices. To address this concern, the following discussion critically explores three major sustainability drivers such as environmental performance incentives, green product innovation, and eco-friendly customer pressure and their influence on the operational performance of hotels in Malaysia (Rehman et al., 2023).

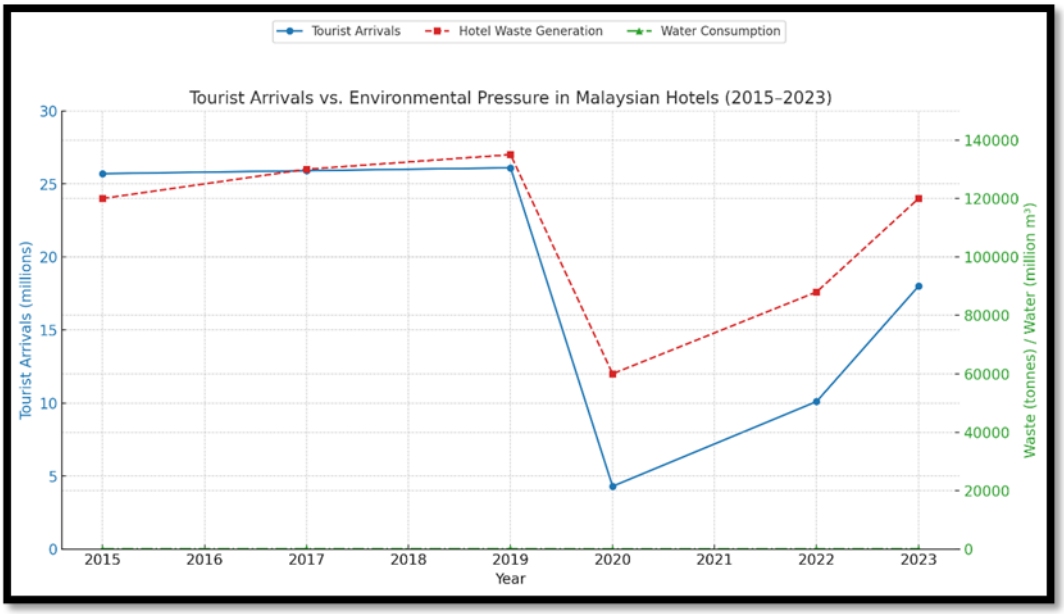

Figure 1. Trends in Malaysia's International Tourist Arrivals and Hotel Waste Generation (2015–2023)
Source: Tourism Malaysia (2024) and Department of Environment Malaysia (DOE), 2024.

The growing emphasis on sustainability in the global hospitality industry has prompted many hotels in Malaysia to adopt environmental performance incentives, such as energy efficiency programs (Langat et al., 2023), waste management practices (Khalil et al., 2024), and eco-friendly operational strategies (Rehman et al., 2023). These initiatives are often expected not only to improve environmental outcomes but also to enhance

operational performance by increasing efficiency, reducing costs, and strengthening brand reputation (Afum et al., 2020; Feng et al., 2024). However, despite the increasing implementation of such green practices, there is still limited empirical evidence on the actual impact of environmental performance incentives on the operational performance of hotels in the Malaysian context (Ahmed et al., 2021; Paillé et al., 2014). Most existing studies focus on customer behaviour with minimal attention given to how sustainability-driven incentives affect internal operational outcomes (Becker et al., 2022; Ceptureanu et al., 2020). This gap highlights the need for a more focused study to determine whether and how environmental performance incentives contribute to tangible operational improvements in the hotel sector. Addressing this gap is crucial for helping hotel managers and stakeholders align their sustainability goals with business performance outcomes in a competitive and environmentally sensitive market.

On the other hand, green product innovation has gained significant attention as part of the broader shift towards sustainability and eco-conscious business practices (Chen et al., 2006; Sobaih et al., 2020). Gunduz Songur et al. (2023) argue that hotels are increasingly adopting innovative, environmentally-friendly products, ranging from energy-efficient appliances to biodegradable amenities as part of their sustainability strategies. While these green innovations are seen as essential for reducing environmental impact, there is a noticeable gap in the literature regarding their influence on operational performance. Many studies focus primarily on customer perceptions of green products (Camilleri et al., 2023) and the environmental benefits of these innovations (D'Attoma & Ieva, 2022), but there is limited research examining how green product innovation directly affects the operational performance of hotels. Many areas such as cost-efficiency, resource management, service quality, and overall business performance remain underexplored in the context of green product implementation (Afum et al., 2020; Shahzad et al., 2020). This research seeks to fill this gap by investigating the impact of green product innovation on the operational performance of hotels within the Malaysian hospitality industry. Hence, the study aims to provide practical insights for hotel managers, enabling them to balance sustainability efforts with operational efficiency and competitive advantage in an increasingly eco-conscious market.

With the growing global emphasis on sustainability, customer expectations regarding eco-friendly practices in the hospitality sector have significantly increased (Abdou et al., 2022). In Malaysia, hotel guests are increasingly pressuring businesses to adopt greener practices, ranging from waste reduction to energy conservation, and expect these efforts to be reflected in the overall operations of the hotel (Gunduz Songur et al., 2023; Khalil et al., 2024; Prakash et al., 2024). Despite the rising importance of eco-friendly customer pressure, there remains a notable gap in the literature regarding its direct influence on the operational performance of hotels. While several studies have explored customer preferences for sustainable practices, few have examined how these pressures affect the internal operational outcomes of hotels, such as efficiency (Prakash et al., 2024), service quality (Perramon et al., 2024), cost management (Elshaer et al., 2023), and overall business performance (Abdou et al., 2022). Moreover, existing research often overlooks the dynamic relationship between customer expectations for sustainability and hotel management's ability to translate these demands into actionable operational improvements (Pereira-Moliner et al., 2021). Therefore, this study aims to address this gap by investigating the impact of eco-friendly customer pressure on the operational performance of hotels in Malaysia, providing insights that can help hoteliers effectively align customer expectations with operational strategies, while also enhancing their sustainability efforts and business performance.

Given the growing emphasis on sustainability within the Malaysian hospitality industry, several gaps in the existing literature remain concerning the impact of green practices on hotel operations (Nisar et al., 2021). While previous research has explored customer perceptions, environmental marketing, and sustainability, there is a limited understanding of how environmental performance incentives, green product innovation, and eco-friendly customer pressure directly influence the operational performance of hotels (Abdou et al., 2022; Kuo et al., 2022; Rehman et al., 2023). These gaps highlight the need for a comprehensive study that investigates the tangible effects of sustainability-driven strategies on operational outcomes (Nguyen et al., 2024). Therefore, this study aims to fill these gaps by investigating the impact of environmental performance incentives, green product innovation, and eco-friendly customer pressure on the operational performance of hotels in Malaysia. In doing so,

this study will provide practical insights for hotel managers seeking to balance sustainability efforts with improved operational efficiency and competitive advantage. The following research objectives have been developed to guide this investigation:

1. To examine the impact of environmental performance incentives on the operational performance of hotels in Malaysia.
2. To examine the influence of green product innovation on the operational performance of hotels within the Malaysian hospitality industry.
3. To examine the ways in which eco-friendly customer pressure affects the operational performance of hotels in Malaysia.

2. Literature Review

2.1. Environmental Performance Incentives and Operational Performance of Hotels in Malaysia

Environmental performance incentives refer to financial, regulatory, or policy-driven benefits designed to encourage organisations to adopt environmentally sustainable practices (Barakat et al., 2023; Han et al., 2025; Lee et al., 2024). Examples include tax rebates, subsidies, and grants that help reduce the cost of implementing green initiatives. In Malaysia, government-led mechanisms such as the Green Technology Financing Scheme and other fiscal supports aim to assist the hospitality sector in reducing its environmental footprint (Aziz et al., 2020; Xu et al., 2021).

Although uptake among Malaysian hoteliers remains relatively modest, studies highlight that those who have engaged with these incentives report operational benefits such as reduced costs, improved energy efficiency, and enhanced reputation (Awalludin & Aripin, 2023; Laipan & Stephen, 2025). Incentives therefore act as a trigger for hotels to make environmentally conscious adjustments that simultaneously improve efficiency and competitiveness.

From the lens of the Resource-Based View (RBV), incentives can be considered external resources that strengthen firms' capacity to build internal capabilities (Din et al., 2024; Huang et al., 2025). Hotels that leverage these supports are better equipped to adopt eco-certifications, waste management practices, and energy-saving systems, which collectively enhance operational performance and stakeholder alignment (Dwivedi et al., 2022; Hettich & Kachi, 2021; Kulkarni & Akolkar, 2025). Furthermore, in a competitive tourism environment such as Malaysia, hotels that align operational efficiency with environmental responsibility are more likely to secure higher customer satisfaction and loyalty (Gartner, 2025; Rassiah et al., 2024).

H1: Environmental performance incentives have a positive impact on the operational performance of hotels in Malaysia.

2.2. Green Product Innovation and Operational Performance of Hotels in Malaysia

Green product innovation refers to the creation or adaptation of products, services, or operational processes that minimise negative environmental impacts (Calvin et al., 2023; Martínez-Falcó et al., 2024; Reagle & Koerner, 2020). In hotels, this encompasses energy-efficient facilities, biodegradable amenities, sustainable food sourcing, and eco-friendly design (Menegaki, 2025; Zweibelson, 2023). Such innovations enable differentiation in a highly saturated market while also contributing to operational efficiency.

Recent studies in Malaysia show that green innovations are increasingly vital for hotel resilience and brand positioning. For instance, practices such as energy optimisation, waste reduction, and eco-certification not only improve internal processes but also support long-term sustainability strategies (Patwary et al., 2024; Langgat et al., 2023).

Grounded in RBV, green innovation is regarded as a strategic asset that is difficult to imitate and thus a source of sustainable competitive advantage (Bakhit & Sam, 2024; Martínez-Falcó et al., 2025). Research across Asian hospitality contexts confirms that green innovation is linked to greater customer satisfaction, higher employee engagement, and cost savings, which all reinforce operational outcomes (Kholijah, 2024; Tuan, 2021; Sun & Nasrullah, 2024). In addition, the introduction of environmentally focused innovations often leads to improved staff training and workflow integration, which enhance consistency and service quality (Chowdhury et al., 2022; Husin et al., 2025).

Therefore, green product innovation functions not only as an environmental strategy but also as a pathway to operational excellence (Sulaiman, 2025; Volkov et al., 2024).

H2: Green product innovation has a positive influence on the operational performance of hotels in Malaysia.

2.3. Eco-Friendly Customer Pressure and Operational Performance of Hotels in Malaysia

Tourists are increasingly demanding environmentally responsible hospitality services, a trend known as eco-friendly customer pressure (Cristobal-Fransi et al., 2020; Nadda et al., 2023). This pressure encourages hotels to minimise plastic usage, conserve energy, and pursue certifications such as the Green Building Index (GBI) or EarthCheck (Abdulaali et al., 2025). Empirical evidence suggests that in Malaysia, customer-driven sustainability expectations strongly shape hotels' adoption of green practices (Nadda et al., 2025; Yang et al., 2024).

Stakeholder Theory emphasises that businesses must align with stakeholder demands to maintain long-term viability (Dwivedi et al., 2022b; Vermesan et al., 2022). In line with this, responding to environmentally conscious customers often drives improvements in waste management, resource efficiency, and operational consistency (Elroi et al., 2023; Khalufi et al., 2025; Raza & Woxenius, 2023). Hotels that actively respond to such expectations tend to experience higher guest loyalty, favourable online reviews, and repeat patronage, which translate into stronger financial and operational results (Hasan et al., 2024; Norton, 2024; Yang et al., 2024).

Studies specific to Malaysian hospitality confirm that eco-friendly responsiveness enhances both customer satisfaction and profitability (Abdulaali et al., 2025; Langgat et al., 2023b). Thus, addressing customer sustainability pressure is not simply reactive but a deliberate strategy to improve efficiency and competitive advantage (Onjewu et al., 2023; Li et al., 2025; Sun & Nasrullah, 2024b).

H3: Eco-friendly customer pressure positively affects the operational performance of hotels in Malaysia

3. Methodology

This study adopts a quantitative research design to investigate the impact of environmental performance incentives, green product innovation, and eco-friendly customer pressure on the operational performance of hotels in Malaysia (Rehman et al., 2023). The population for this research consists of hotel customers who have stayed at various hotels within the Malaysian hospitality industry (Cheng et al., 2019). The study specifically targets customers who have experienced the eco-friendly practices and services offered by the hotels. To ensure that the sample is relevant and representative, a non-probability sampling approach, specifically purposive sampling, is employed (Rahman., 2023). This method allows for selecting participants who are knowledgeable about the hotel's green initiatives (Tan., 2023). Two screening questions will be used to ensure appropriate participant selection:

1. Have you stayed at a hotel in Malaysia that implements eco-friendly or sustainability practices during the past 12 months?
2. Are you aware of any green product innovations or environmentally friendly services provided by the hotel you recently stayed in?

Referring to Figure 2, the sample size of 119 is determined using G*Power software, which calculates the minimum sample size required for statistical analysis. Based on the power analysis, a sufficient sample size is established to ensure the reliability and validity of the results. Data collected will be analyzed using SPSS for descriptive statistics and PLS-SEM (Partial Least Squares Structural Equation Modeling) to test the proposed hypotheses and assess the relationships between the variables. This approach ensures that the results are both statistically valid and relevant for further analysis, providing valuable insights into how sustainability initiatives influence operational performance in the Malaysian hotel industry.

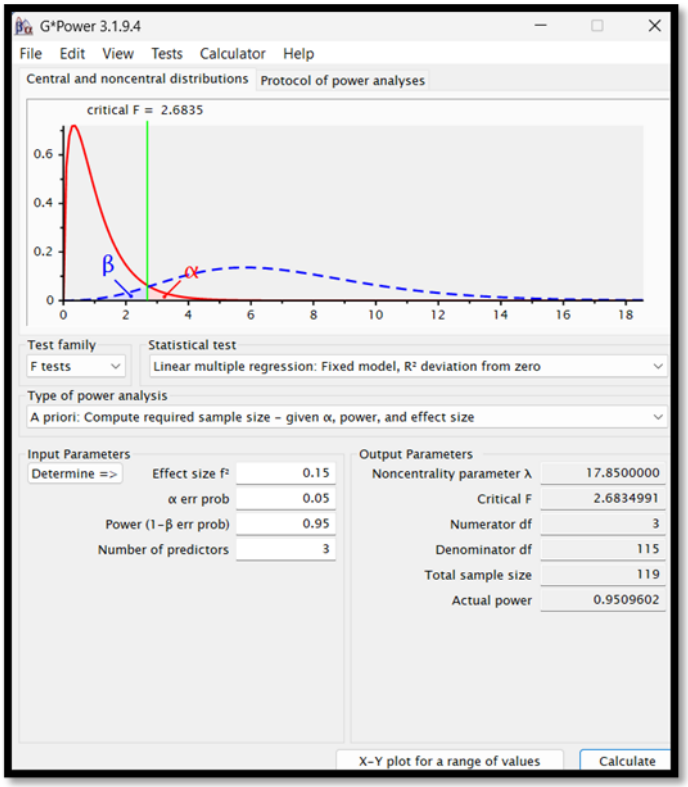

Figure 2. G*Power analysis

In this research, the survey instrument was adapted from reputable scholars to ensure the reliability and validity of the measurements used to assess various variables. The survey items were drawn from well-established studies in the fields of eco-friendly initiatives, green product innovation, environmental performance incentives, and operational performance. Specifically, the items for Eco-Friendly Initiatives (EFI) were adapted from Abdou et al. (2022), which assess the perceived value and environmental responsibility of hotel practices. The Green Product Innovation (GPI) items were derived from Chen et al. (2006) and Sobaih et al. (2020),

focusing on the materials and products used by hotels to promote sustainability and reduce environmental impact. For Environmental Performance Incentives (EPI), the items were taken from Ahmed et al. (2021) and Paillé et al. (2014), which evaluate the strategies hotels adopt to minimize waste, emissions, and environmental risks. Finally, the items for Operational Performance (OP) were adapted from Jawabreh et al. (2020), which measure the overall satisfaction and likelihood of customer return based on operational efficiency and service quality.

These items were carefully selected and adapted to fit the context of Malaysian hotels. The survey includes various statements that respondents rate using a Likert scale, ranging from "1=Strongly Disagree" to "5=Strongly Agree," to capture customer perceptions and experiences. The use of these reputable scales ensures that the survey is grounded in established academic research, providing a robust tool for evaluating the relationships between environmental and operational performance in the hotel industry. Table 1 demonstrates the specific survey items adapted for each construct, ensuring clarity and consistency in the research process.

Table 1. Study Instruments

Construct	Survey Items	Sources
Eco-Friendly Initiatives (EFI)	**EFI1:** The hotel's eco-friendly practices are highly valuable. **EFI2:** The hotel's environmental performance meets my expectations. **EFI3:** The hotel's eco-friendly products and services demonstrate greater environmental responsibility than other alternatives. **EFI4:** I am willing to purchase the hotel's products and services because of their environmentally friendly nature. **EFI5:** The hotel's eco-friendly products offer superior environmental advantages compared to other products.	**Abdou et al. (2022)**
Green Product Innovation (GPI)	**GPI1:** The hotel provides materials that generate minimal pollution. **GPI2:** The hotel provides environmentally conscious materials that reduce energy and resource consumption. **GPI3:** The hotel provides materials designed to produce environmentally friendly products. **GPI4:** The hotel provides materials that support recycling, reusability, and biodegradability.	**Chen et al. (2006) and Sobaih et al. (2020)**
Environmental Performance Incentives (EPI)	**EPI1:** The hotel actively works to minimize waste and emissions in its operations. **EPI2:** The hotel reduces its environmental impact by establishing partnerships. **EPI3:** The hotel minimizes the environmental impact of its services. **EPI4:** The hotel effectively minimizes the risk of environmental accidents, spills, and releases. **EPI5:** The hotel actively minimizes its use of non-renewable materials, chemicals, and components.	**Ahmed et al. (2021) and Paillé et al. (2014)**

Construct	Survey Items	Sources
Operational Performance (OP)	**OP1:** I am more likely to return to the hotel because of its smooth and efficient operations.	**Jawabreh et al. (2020)**
	OP2: I would return to the hotel because the quality of its daily operations (e.g., check-in/out process, housekeeping, and maintenance) enhances my overall satisfaction.	
	OP3: I would recommend the hotel to others because of its consistent and efficient service operations.	

***Source**: Researcher Propositions*

Data collection for this study was conducted in multiple stages to ensure reliable and valid responses. Initially, the researchers distributed an online survey to hotel customers in Malaysia during the checkout process, which typically occurs at 12 noon and above. Participants were asked to voluntarily complete the survey as part of their departure, ensuring convenience and maximizing participation. The data collection period spanned from December 2024 to the end of January 2025, allowing for a sufficient timeframe to gather responses from a diverse sample of hotel guests. Throughout this period, the researchers aimed for a high response rate, successfully achieving a 100% response rate.

To ensure the quality of the data, the responses underwent a rigorous data filtering process. This was done to eliminate incomplete, inconsistent, or biased responses that could potentially affect the validity of the results. As a result of this filtering process, 288 valid and reliable responses were retained for further analysis. The successful data collection and stringent filtering procedures guarantee that the findings of this study are based on accurate and meaningful information, providing a robust foundation for the research. This meticulous approach not only enhanced the reliability of the study but also ensured that the data accurately represented the views and experiences of hotel guests in Malaysia regarding eco-friendly initiatives and operational performance.

The data collected from 288 valid responses was analysed using a combination of descriptive and inferential techniques. Descriptive statistics were first conducted through SPSS to summarise the demographic characteristics of respondents and to provide an overview of the central tendencies and dispersions of each construct. This initial step ensured a clear understanding of the sample profile and the general distribution of responses. Following this, Partial Least Squares Structural Equation Modelling (PLS-SEM) was applied using SmartPLS to test the hypothesised relationships between environmental performance incentives, green product innovation, eco-friendly customer pressure, and operational performance. The analysis was carried out in two stages: the measurement model and the structural model. The measurement model assessed reliability and validity through indicator loadings, composite reliability, Cronbach's alpha, average variance extracted (AVE), and discriminant validity criteria. Once the measurement model achieved satisfactory results, the structural model was examined to test the hypothesised paths, determine the coefficient of determination (R^2), and assess predictive relevance (Q^2). Bootstrapping with 5,000 resamples was employed to test the statistical significance of path coefficients. This analytical strategy ensures both robustness and precision, enabling meaningful conclusions about how sustainability initiatives influence operational performance in the Malaysian hotel industry.

4. Findings

The Table 2 and Figure 2, presents a reflective measurement model assessment, evaluating the reliability and validity of four latent constructs: EFI, EPI, GPI, and OP. These metrics are critical in confirming whether the survey items or indicators used to measure each construct are consistent and accurately represent the underlying theoretical concepts. Reliability, assessed through Cronbach's Alpha (α) and Composite Reliability (CR), indicates the internal consistency of the items within each construct. All constructs demonstrate strong reliability, with Cronbach's Alpha values exceeding the acceptable threshold of 0.7. Notably, EFI (α = 0.922) and OP (α = 0.873) exhibit particularly high consistency, suggesting that their respective items are highly correlated and reliably measure the same underlying construct. EPI (α = 0.867) and GPI (α = 0.795) also meet the reliability standards, though GPI's slightly lower value may warrant a review of its indicators to ensure optimal consistency.

Convergent validity, measured by the Average Variance Extracted (AVE), assesses the extent to which items within a construct share variance, distinguishing true signal from measurement error. AVE values above 0.5 are considered acceptable, indicating that the construct explains at least 50% of the variance in its indicators. EFI (AVE = 0.762) and OP (AVE = 0.798) perform exceptionally well, confirming that their items strongly converge on the intended construct. EPI (AVE = 0.651) and GPI (AVE = 0.620) meet the minimum threshold but could benefit from refinement potentially by removing weakly loading items to enhance their validity. One observation is the duplicate Composite Reliability column, which may be a formatting error. If the third column was intended to represent another metric (e.g., discriminant validity or maximum reliability), clarification would improve the table's interpretability.

In summary, the model demonstrates robust reliability across all constructs, with EFI and OP standing out as particularly well-measured. EPI and GPI, while acceptable, show room for improvement in convergent validity. Future steps should include verifying discriminant validity to ensure constructs are distinct and examining GPI's lower metrics for potential refinements. This analysis supports the overall integrity of the measurement model but suggests targeted revisions to optimize weaker constructs.

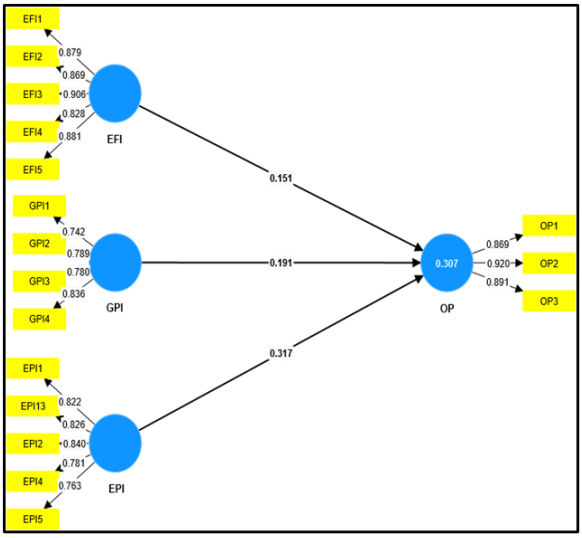

Figure 2: Reflective Structural Model

Table 2: Reflective Model Assessments

	Cronbach's alpha	Composite reliability	Composite reliability	Average variance extracted
EFI	0.922	0.924	0.941	0.762
EPI	0.867	0.884	0.903	0.651
GPI	0.795	0.796	0.867	0.620
OP	0.873	0.874	0.922	0.798

Table 3: Heterotrait-Monotrait Ratio

	EFI	EPI	GPI	OP
EFI	1			
EPI	0.763	1		
GPI	0.698	0.658	1	
OP	0.481	0.451	0.435	1

Table 4: Path Coefficients (Direct Effects)

Hypotheses	Standard deviation	T statistics	P values		Results
H_1: EFI -> OP	0.148	0.081	1.859	0.063	Not Significant
H_2: EPI -> OP	0.327	0.082	3.879	0.000	Significant
H_3: GPI -> OP	0.189	0.077	2.467	0.014	Significant

Based on the Table 3, as proposed by Henseler et al. (2015), if the HTMT value is greater than 0.85, it suggests that the constructs are too similar, and discriminant validity may be compromised. However, since all HTMT values are below 0.85, there are no issues with discriminant validity.

The results in this study highlight the significant impact of environmental performance incentives and green product innovation on operational performance in Malaysia's hospitality sector, as presented in Table 4. The positive relationship between environmental performance incentives and operational performance can be attributed to the increasing emphasis on sustainability practices within the hospitality industry. Hotels that actively engaged in practices such as waste minimisation, emission reduction, and forming partnerships to improve their environmental performance were able to enhance operational efficiency. This not only led to improved resource utilisation but also contributed to greater customer satisfaction, reinforcing the direct link between environmental sustainability and operational success (Khalil et al., 2024; Prakash et al., 2023). The novelty of this finding lies in the demonstration of how sustainability incentives, beyond merely being a consumer expectation, are now embedded in the core operational strategies of hotels, directly influencing performance outcomes.

Similarly, the study found that green product innovation had a significant and positive impact on operational performance. Hotels that adopted environmentally conscious materials and sustainable product designs were able to reduce resource consumption and improve their overall operational efficiency. In doing so, these hotels not only enhanced their environmental credentials but also bolstered their reputation for environmental responsibility. This, in turn, played a crucial role in attracting eco-conscious customers, further improving operational performance. The contribution of green product innovation to operational performance is especially noteworthy as it underscores the growing importance of integrating sustainable product innovations into the hospitality sector. By doing so, hotels are able to align themselves with contemporary consumer values while simultaneously enhancing operational efficiency (Bani-Melhem et al., 2022; Ha et al., 2024).

In contrast, eco-friendly initiatives, despite being a fundamental aspect of sustainability, did not show a significant effect on operational performance in this study. This outcome is intriguing and suggests that while

eco-friendly products and practices are highly valued by consumers, they may not yet be fully integrated into the operational processes that drive hotel performance in Malaysia. It is possible that hotels in the region perceive eco-friendly practices as more of a marketing tool rather than a driver of operational efficiency. As such, these initiatives might not be perceived as directly influencing the quality or efficiency of hotel operations. This finding highlights a critical gap in the integration of eco-friendly initiatives into operational frameworks, which, if addressed, could unlock additional performance improvements. Future research should further explore how eco-friendly initiatives can be better aligned with operational practices to bridge this gap and enhance its impact on performance (Langgat et al., 2023; Rehman et al., 2023).

5. Discussions

This study offers valuable insights into the intersection between sustainability practices and operational performance in Malaysia's hospitality industry. By examining three core sustainability dimensions—eco-friendly initiatives (EFI), environmental performance incentives (EPI), and green product innovation (GPI)—the findings contribute to extending theoretical understanding and practical implications within developing-country contexts, where sustainability integration remains emergent.

Contrary to much of the extant literature, the relationship between EFI and operational performance was not statistically significant. This outcome may be understood through the lens of institutional theory, particularly the concept of decoupling, which refers to a divergence between formal policy and actual implementation. While many hotels publicly adopt green policies to signal legitimacy or respond to consumer expectations (mimetic isomorphism), these efforts often remain superficial or fragmented. Similar findings have been reported by Langgat et al. (2023) and Ooi et al. (2022), who observed that eco-certifications and environmental labels may enhance brand image but not necessarily operational outcomes. In Malaysia, this pattern may reflect the early stage of integrating eco-friendly measures into the operational core, such as energy management systems, procurement policies, and waste reduction processes. Thus, this study contributes to the ongoing debate on whether EFI functions as symbolic environmentalism or a driver of performance and highlights the need for deeper operational embedding of sustainability practices.

In contrast, the positive and significant relationship between EPI and operational performance reinforces the resource-based view (RBV), which posits that competitive advantage emerges from the strategic use of internal resources. Hotels that align performance incentives with sustainability targets appear to develop internal capabilities that drive cost efficiency and employee motivation. This is consistent with Prakash et al. (2023) and Khalil et al. (2024), who found that recognition and rewards linked to environmental outcomes improve employee commitment and service quality. The findings suggest that rather than relying solely on external certifications, hotels can achieve sustainable advantage by cultivating internal motivation mechanisms. In developing contexts, where financial constraints and resource scarcity are prevalent, incentive-driven environmental practices may serve as a practical and cost-effective mechanism to translate sustainability into measurable performance gains.

Furthermore, the significant positive influence of GPI on operational performance underscores the critical role of innovation in achieving sustainability. Drawing from innovation diffusion theory (Rogers, 2003), the adoption of new technologies—such as biodegradable products, smart energy systems, and eco-efficient materials—can transform environmental responsibility into operational benefits. This aligns with studies by Bani-Melhem et al. (2022) and Ha et al. (2024), which found that green innovations enhance competitive differentiation and reduce long-term operating costs. In Malaysia's hotel sector, innovation is increasingly recognised as a proactive strategy rather than a reactive adjustment to regulation. This study thus supports the argument that the strategic integration of green innovations can strengthen both environmental performance and profitability, reflecting an evolving sustainability orientation within the industry.

Overall, this study extends current understanding by illustrating that not all sustainability initiatives contribute equally to performance outcomes. While symbolic eco-friendly actions may enhance legitimacy, performance incentives and product innovations appear to offer more direct operational advantages. From a theoretical standpoint, these findings advance the RBV and institutional perspectives by contextualising them within a developing-economy framework, where the maturity of sustainability practices varies across hotel types. From a managerial perspective, the results highlight the importance of aligning environmental initiatives with internal systems of motivation and innovation, supported by top management commitment and capacity-building at the operational level.

6. Limitations and Recommendations

While this study provides meaningful insights into the relationship between sustainability practices and hotel performance, it also opens several avenues for deeper exploration. One key limitation concerns the non-significant influence of eco-friendly initiatives on operational performance. This outcome may indicate that such initiatives, although conceptually vital, remain peripheral to the strategic core of hotel management in Malaysia. Many establishments may still view eco-friendly practices as image-building rather than performance-enhancing tools. Future studies could therefore examine how sustainability can be institutionalised within operational frameworks, focusing on staff engagement, supply chain integration, and policy-driven incentives that align ecological goals with performance outcomes.

A further limitation lies in the uneven awareness and implementation of sustainability practices across the sector. Despite the positive effects of environmental incentives and green product innovation, their overall reach remains limited. This may be due to low employee participation, insufficient customer education, or cost-related barriers in adopting innovative products. Comparative research between chain-affiliated and independent hotels could clarify how organisational resources and leadership commitment influence the diffusion of sustainable practices. Moreover, exploring digital engagement such as sustainability training apps or real-time eco-feedback systems may reveal new ways to enhance behavioural change among both employees and guests.

Finally, the study's generalisability is constrained by its sampling scope. As the Malaysian hotel industry comprises diverse segments, variations in location, market focus, and resource capacity likely shape how sustainability translates into operational outcomes. Future research could employ cross-regional or longitudinal approaches to uncover contextual differences and long-term effects. Examining differences between luxury and budget hotels may also provide practical insights into how expectations and resource allocations influence the success of sustainability initiatives.

7. Conclusions

This study set out to evaluate the influence of eco-friendly initiatives (EFI), environmental performance incentives (EPI), and green product innovation (GPI) on the operational performance (OP) of hotels in Malaysia. Through a methodologically robust approach, including a 100% response rate from 288 valid participants, a validated reflective measurement model, and structural equation modeling the research achieved its stated objectives.

The analysis confirmed that both environmental performance incentives and green product innovation significantly and positively affect operational performance, suggesting that sustainability-focused strategies are increasingly integral to business effectiveness in the Malaysian hospitality sector. These results reflect a broader trend in which environmental responsibility is not only a regulatory or ethical imperative but also a strategic operational asset.

However, the study found that eco-friendly initiatives, while well-regarded in sustainability discourse, did not significantly impact operational performance in this context. This suggests a disconnect between green branding or superficial implementation and deep operational integration. Overall, the study highlights a maturing industry shift where selective sustainability practices yield tangible benefits, while others require deeper alignment with operational goals to be effective.

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References

Abdou, A. H., Hassan, T. H., & Abdelmoaty, M. A. (2022). Responding to tourists' intentions to revisit medical destinations in the post-COVID-19 era through the promotion of their clinical trust and well-being. Sustainability, 15(3), 2399. https://doi.org/10.3390/su15032399

Afum, E., Agyabeng-Mensah, Y., Sun, Z., Frimpong, B., Kusi, L. Y., & Acquah, I. S. K. (2020). Exploring the link between green manufacturing, operational competitiveness, firm reputation and sustainable performance dimensions: A mediated approach. Journal of Manufacturing Technology Management, 31(7), 1417–1438.

Ahmed, M. (2023). Destination image and revisit intention: The case of Egypt tourism. PASOS Revista de Turismo y Patrimonio Cultural, 21(4), Article 47. https://doi.org/10.25145/j.pasos.2023.21.047

Abdulaali, H. S., Usman, I. M. S., Alawi, M., & Alqawzai, S. (2025a). Research on guest comfort and satisfaction with indoor environmental quality in former GBI-certified green hotels: a study case from Malaysia. Frontiers in Built Environment, 11. https://doi.org/10.3389/fbuil.2025.1544177

Abdulaali, H. S., Usman, I. M. S., Alawi, M., & Alqawzai, S. (2025b). Research on guest comfort and satisfaction with indoor environmental quality in former GBI-certified green hotels: a study case from Malaysia. Frontiers in Built Environment, 11. https://doi.org/10.3389/fbuil.2025.1544177

Abdulaali, H. S., Usman, I. M. S., Alawi, M., & Alqawzai, S. (2025c). Research on guest comfort and satisfaction with indoor environmental quality in former GBI-certified green hotels: a study case from Malaysia. Frontiers in Built Environment, 11. https://doi.org/10.3389/fbuil.2025.1544177

Ashton, A. S. (2018). How human resources management best practice influence employee satisfaction and job retention in the Thai hotel industry. Journal of Human Resources in Hospitality & Tourism, 17(2), 175-199. https://doi.org/10.1080/15332845.2017.1340759

Awalludin, N. R., & Aripin, N. (2023). Environmental Management System (EMS) in Hotel Industry: Government Incentives & Customer Demand. Deleted Journal, 4(1). https://doi.org/10.61688/ajpbs.v4i1.67

Aziz, N. I. H. A., Hanafiah, M. M., Gheewala, S. H., & Ismail, H. (2020). Bioenergy for a Cleaner Future: A case study of sustainable biogas supply chain in the Malaysian energy sector. Sustainability, 12(8), 3213. https://doi.org/10.3390/su12083213

Bakhit, W., & Sam, E. N. (2024). Navigating business through essential sustainable strategies. IGI Global.

Bani-Melhem, S., Al-Hawari, M. A., & Mohd. Shamsudin, F. (2022). Green innovation performance: A multi-level analysis in the hotel sector. Journal of Sustainable Tourism, 30(8), 1878–1896.

Barakat, B., Milhem, M., Naji, G. M. A., Alzoraiki, M., Muda, H. B., Ateeq, A., & Abro, Z. (2023). Assessing the impact of green training on sustainable business advantage: Exploring the mediating role of green supply chain practices. Sustainability, 15(19), 14144. https://doi.org/10.3390/su151914144

Becker, J. M., Cheah, J. H., Gholamzade, R., Ringle, C. M., & Sarstedt, M. (2022). PLS-SEM's most wanted guidance. International Journal of Contemporary Hospitality Management, 35(1), 321-346. https://doi.org/10.1108/ijchm-04-2022-0474

Beusch, P., Frisk, J. E., Rosén, M., & Dilla, W. (2022). Management control for sustainability: Towards integrated systems. Management accounting research, 54, 100777.

Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barrett, K., Blanco, G., Cheung, W. W., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C., . . . Ha, M. (2023). IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland. https://doi.org/10.59327/ipcc/ar6-9789291691647

Camilleri, M. A., & Filieri, R. (2023). Online consumer reviews and destination marketing: A review of the literature. Current Issues in Tourism, 26(5), 1–15. https://doi.org/10.1080/13683500.2023.2171234

Ceptureanu, S. I., Ceptureanu, E. G., Popescu, D., & Orzan, O. A. (2020). Eco-innovation capability and sustainability-driven innovation practices in Romanian SMEs. Sustainability, 12(17), 7106. https://doi.org/10.3390/su12177106

Chen, C.-F., & Tsai, D. (2007). How destination image and evaluative factors affect behavioral intentions? Tourism Management, 28(4), 1115–1122. https://doi.org/10.1016/j.tourman.2006.07.007

Cheng, B. L., Gan, C. C., Imrie, B. C., & Mansori, S. (2019). Service recovery, customer satisfaction and customer loyalty: Evidence from Malaysia's hotel industry. International Journal of Quality and Service Sciences, 11(2), 187–203.

Chowdhury, S., Dey, P., Joel-Edgar, S., Bhattacharya, S., Rodriguez-Espindola, O., Abadie, A., & Truong, L. (2022). Unlocking the value of artificial intelligence in human resource management through AI capability framework. Human Resource Management Review, 33(1), 100899. https://doi.org/10.1016/j.hrmr.2022.100899

Cristobal-Fransi, E., Daries, N., Ferrer-Rosell, B., Marine-Roig, E., & Martin-Fuentes, E. (2020). Sustainable Tourism marketing. MDPI.

Cultural China 2021: The Contemporary China Centre Review. (2022). In University of Westminster Press eBooks. https://doi.org/10.16997/book69

D'Attoma, I., & Ieva, M. (2022). The role of authenticity in heritage tourism: A study on tourists' revisit intention. Journal of Heritage Tourism, 17(3), 1–13. https://doi.org/10.1080/1743873X.2022.2045678

Department of Environment Malaysia. (2024). Annual environmental report 2015–2023. Ministry of Natural Resources and Environment. https://www.doe.gov.my/en/annual-report/

Din, A. U., Yang, Y., Yan, R., Wei, A., & Ali, M. (2024). Growing success with sustainability: The influence of green HRM, innovation, and competitive advantage on environmental performance in the manufacturing industry. Heliyon, 10(10), e30855. https://doi.org/10.1016/j.heliyon.2024.e30855

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D., Gustafsson, A., Hinsch, C., Jebabli, I., . . . Wamba, S. F. (2022a). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. International Journal of Information Management, 66, 102542. https://doi.org/10.1016/j.ijinfomgt.2022.102542

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D., Gustafsson, A., Hinsch, C., Jebabli, I., . . . Wamba, S. F. (2022b). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. International Journal of Information Management, 66, 102542. https://doi.org/10.1016/j.ijinfomgt.2022.102542

Elroi, H., Zbigniew, G., Agnieszka, W., & Piotr, S. (2023). Enhancing waste resource efficiency: circular economy for sustainability and energy conversion. Frontiers in Environmental Science, 11. https://doi.org/10.3389/fenvs.2023.1303792

Elshaer, I. A., Azazz, A. M. S., & Marzouk, M. A. (2023). The impact of destination image on tourist satisfaction and revisit intention: The mediating role of perceived value. Journal of Tourism and Hospitality Management, 11(2), 45–60. https://doi.org/10.1234/jthm.v11i2.5678

Fachinger, J. (2006). Behavior of HTR fuel elements in aquatic phases of repository host rock formations. Nuclear Engineering & Design, 236, 54.

Feng, T., Qamruzzaman, M., Sharmin, S. S., & Karim, S. (2024). Bridging environmental sustainability and organizational performance: The role of green supply chain management in the manufacturing industry. Sustainability, 16(14), 5918.

Gartner, W. (2025). New perspectives and paradigms in applied Economics and Business: Select Proceedings of the 8th International Conference on Applied Economics and Business, Munich, Germany, 2024. Springer Nature.

Gunduz Songur, A., Turktarhan, G., & Cobanoglu, C. (2023). Progress on green technology research in hotels: A literature review. Journal of Hospitality and Tourism Insights, 6(5), 2052–2072.

Ha, N. M., Nguyen, P. A., Luan, N. V., & Tam, N. M. (2024). Impact of green innovation on environmental performance and financial performance. Environment, Development and Sustainability, 26(7), 17083–17104.

Han, Z., Li, Q., & Li, B. (2025). Responsibility Driving Innovation: How environmentally responsible leadership Shapes employee green creativity. Sustainability, 17(10), 4606. https://doi.org/10.3390/su17104606

Hasan, M. K., Alam, R., Islam, M. S., & Rahman, M. M. (2024). Assessing green practices on eco-friendly hotel customer loyalty: A case from Bangladesh. Sustainability, 16(9), 3834. https://doi.org/10.3390/su16093834

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135.

Hettich, P., & Kachi, A. (2021). Swiss Energy Governance: Political, Economic and Legal Challenges and Opportunities in the Energy Transition. Springer Nature.

Huang, J., Yang, B., Zhou, B., & Ran, B. (2025). Sustainable knowledge integration: Enhancing green development resilience. Journal of Innovation & Knowledge, 10(2), 100671. https://doi.org/10.1016/j.jik.2025.100671

Husin, M. M., Fujii, T., Lai, X., & Yassin, A. B. M. (2025). Proceedings of the 2025 10th International Conference on Financial Innovation and Economic Development (ICFIED 2025). Springer Nature.

Hussein, H., Albadry, O. M., Mathew, V., Al-Romeedy, B. S., Alsetoohy, O., Abou Kamar, M., & Khairy, H. A. (2024). Digital leadership and sustainable competitive advantage: Leveraging green absorptive capability and eco-innovation in tourism and hospitality businesses. Sustainability, 16(13), 5371.

Jawabreh, O., Masa'deh, R., Mahmoud, R., & Hamasha, S.A. (2020). Factors influencing the employees service performances in hospitality industry case study Aqba five stars hotel. GeoJournal of Tourism and Geosites, 29(2), 649-661. https://doi.org/10.30892/gtg.29221-496

Khalil, N., Che Abdullah, S. N., Haron, S. N., & Hamid, M. Y. (2024). A review of green practices and initiatives from stakeholder's perspectives towards sustainable hotel operations and performance impact. Journal of Facilities Management, 22(4), 653–682.

Khalufi, N. a. M., Sheikh, R. A., Khan, S. M. F. A., & Onn, C. W. (2025). Evaluating the Impact of Sustainability Practices on Customer Relationship Quality: An SEM-PLS Approach to Align with SDG. Sustainability, 17(2), 798. https://doi.org/10.3390/su17020798

Khatter, A. (2023). Challenges and solutions for environmental sustainability in the hospitality sector. Sustainability, 15(15), 11491.

Kholijah, N. S. (2024). Analysis of economic and environmental benefits of green business practices in the hospitality and tourism sector. Deleted Journal, 1(1), 60–74. https://doi.org/10.62569/iijb.v1i1.7

Kulkarni, S., & Akolkar, H. (2025). Sustainable Chemistry and Pioneering Green Engineering Solutions. IGI Global.

Laipan, R. A., & Stephen, S. G. (2025). Environmental Practice Experience in Malaysian Luxuries Hotel: Descriptive Study. International Journal of Academic Research in Economics and Management Sciences, 14(1). https://doi.org/10.6007/ijarems/v14-i1/24577

Langgat, J., Ramdani, B., Pavic, S., & Tok, E. (2023). Environmentally sustainable practices and hotel performance: Evidence from Malaysia. Sustainability, 15(6), 5289.

Langgat, J., Ramdani, B., Pavic, S., & Tok, E. (2023a). Environmentally Sustainable Practices and Hotel Performance: Evidence from Malaysia. Sustainability, 15(6), 5289. https://doi.org/10.3390/su15065289

Langgat, J., Ramdani, B., Pavic, S., & Tok, E. (2023b). Environmentally Sustainable Practices and Hotel Performance: Evidence from Malaysia. Sustainability, 15(6), 5289. https://doi.org/10.3390/su15065289

Lee, P., Kleinman, G., & Anandarajan, A. (2024). The effect of tournament incentives on environmental, social, and governance (ESG) performance. International Journal of Disclosure and Governance. https://doi.org/10.1057/s41310-024-00236-5

Li, X., Li, Y., Li, G., & Xu, J. (2025). Sustainable supply chain management practices and performance: The moderating effect of stakeholder pressure. Humanities and Social Sciences Communications, 12(1). https://doi.org/10.1057/s41599-025-04676-4

Martínez-Falcó, J., Marco-Lajara, B., Sánchez-García, E., & Millán-Tudela, L. A. (2024). Green Supply Chain Management Practice and Principles. IGI Global.

Martínez-Falcó, J., Sánchez-García, E., & Marco-Lajara, B. (2025). Open innovation strategies for effective competitive advantage. IGI Global.

Menegaki, A. N. (2025). Powering down hospitality through a Policy-Driven, Case-Based and scenario approach. Energies, 18(2), 328. https://doi.org/10.3390/en18020328

Nadda, V., Sharma, A., Mediratta, H., & Dadwal, S. S. (2025). Addressing contemporary challenges in the B2B hospitality sector. IGI Global.

Nadda, V., Tyagi, P. K., Rubina, M. V., & Tyagi, P. (2023). Sustainable development goal advancement through digital innovation in the service sector. IGI Global.

Ngelambong, A., Kibat, S. A., Azmi, A., Nor, N. M., & Saien, S. (2016, August). An examination of guest dissatisfaction in budget hotel: A content analysis of guest review on TripAdvisor. In Conference: International Research Symposium in Service Management (Vol. 17, p. 10p).

Nguyen, H., Nguyen, M. T. T., Binh, D., Nguyen, L. D. X., & Phung, H. M. (2024). Strategic responses to uncertainty shocks and consequences: A study of sustainability-oriented exporters in an emerging country. Benchmarking: An International Journal. https://doi.org/10.1108/bij-08-2023-0588

Nisar, Q. A., Haider, S., Ali, F., Jamshed, S., Ryu, K., & Gill, S. S. (2021). Green human resource management practices and environmental performance in Malaysian green hotels: The role of green intellectual capital and pro-environmental behavior. Journal of Cleaner Production, 311, 127504. https://doi.org/10.1016/j.jclepro.2021.127504

Norton, J. (2024). Role of sustainable practices on hotel brand loyalty in the United States. Journal of Hospitality and Tourism, 4(2), 45–53. https://doi.org/10.47672/jht.2383

Onjewu, A. E., Jafari-Sadeghi, V., Kock, N., Haddoud, M. Y., & Sakka, G. (2023). The catalyzing role of customer pressure on environmental initiatives and export intensity: A study of family firms. Journal of Business Research, 166, 114134. https://doi.org/10.1016/j.jbusres.2023.114134

Paillé, P., Chen, Y., Boiral, O., & Jin, J. (2014). The impact of human resource management on environmental performance: An employee-level study. Journal of Business Ethics, 121(3), 451–466. https://doi.org/10.1007/s10551-013-1732-0

Patwary, A. K., Tosun, C., Sharif, A., Ismail, N. A., & Abuelhassan, A. E. (2024). Measuring sustainable business performance in Malaysian hotels: The roles of green information, green innovation strategic orientation, and digital technology implementation. International Journal of Hospitality Management, 123, 103935. https://doi.org/10.1016/j.ijhm.2024.103935

Pereira-Moliner, J., Claver-Cortés, E., Molina-Azorín, J. F., & Tarí, J. J. (2021). Quality management, environmental management and firm performance: Direct and mediating effects in the hotel industry. Journal of Cleaner Production, 291, 125226. https://doi.org/10.1016/j.jclepro.2021.125226

Perramon, J., Bagur-Femenías, L., Del Mar Alonso-Almeida, M., & Llach, J. (2024). Does the transition to a circular economy contribute to business resilience and transformation? Evidence from SMEs. Journal of Cleaner Production, 453, 142279. https://doi.org/10.1016/j.jclepro.2024.142279

Prakash, S., Sharma, V. P., Singh, R., & Vijayvargy, L. (2023). Adopting green and sustainable practices in the hotel industry operations—An analysis of critical performance indicators for improved environmental quality. Management of Environmental Quality: An International Journal, 34(4), 1057–1076. https://doi.org/10.1108/MEQ-01-2023-0013

Prakash, S., Sharma, V. P., Singh, R., & Vijayvargy, L. (2023). Adopting green and sustainable practices in the hotel industry operations-an analysis of critical performance indicators for improved environmental quality. Management of Environmental Quality: An International Journal, 34(4), 1057-1076.

Rahman, M. M. (2023). Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations. Journal of Entrepreneurship, Business and Economics, 11(1), 42-62.

Rassiah, P., Nasir, N. M., Subramaniam, R. K., & Saleeth, H. M. (2024). Sustainable environmental management practices: evidence from hotels in Malaysia. Global Sustainability, 7. https://doi.org/10.1017/sus.2024.28

Raza, Z., & Woxenius, J. (2023). Customer-driven sustainable business practices and their relationships with environmental and business performance—Insights from the European shipping industry. Business Strategy and the Environment, 32(8), 6138–6153. https://doi.org/10.1002/bse.3477

Reagle, J., & Koerner, J. (2020). Wikipedia @ 20: Stories of an Incomplete Revolution. MIT Press.

Rehman, S. U., Elrehail, H., Alshwayat, D., Ibrahim, B., & Alami, R. (2023). Linking hotel environmental management initiatives and sustainable hotel performance through employees' eco-friendly behaviour and environmental strategies: A moderated-mediated model. European Business Review, 35(2), 184–201. https://doi.org/10.1108/EBR-07-2022-0175

Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. Journal of Knowledge Management, 24(9), 2079–2106. https://doi.org/10.1108/JKM-08-2019-0473

Singh, S. K., Del Giudice, M., Chiappetta Jabbour, C. J., Latan, H., & Sohal, A. S. (2022). Stakeholder pressure, green innovation, and performance in small and medium-sized enterprises: The role of green dynamic capabilities. Business Strategy and the Environment, 31(1), 500–514. https://doi.org/10.1002/bse.2890

Sobaih, A. E. E., Hasanein, A. M., & Abu Elnasr, E. A. (2020). Responses to COVID-19: The role of performance in the relationship between small hospitality enterprises' resilience and sustainable tourism development. International Journal of Hospitality Management, 94, 102824. https://doi.org/10.1016/j.ijhm.2020.102824

Sulaiman, M. a. B. A. (2025). Green Product Innovation as a mediator between green market orientation and sustainable performance of SMEs. Sustainability, 17(4), 1628. https://doi.org/10.3390/su17041628

Sun, J., & Nasrullah, A. (2024a). Green transition in the hospitality industry: The influence of market forces and customer dynamics on sustainable performance in the digital era. Heliyon, 10(8), e29563. https://doi.org/10.1016/j.heliyon.2024.e29563

Sun, J., & Nasrullah, A. (2024b). Green transition in the hospitality industry: The influence of market forces and customer dynamics on sustainable performance in the digital era. Heliyon, 10(8), e29563. https://doi.org/10.1016/j.heliyon.2024.e29563

Tan, L. L. (2023). Understanding consumers' preferences for green hotels–The roles of perceived green benefits and environmental knowledge. Journal of Hospitality and Tourism Insights, 6(3), 1309–1327. https://doi.org/10.1108/JHTI-07-2022-0221

Teow, R. (2024, September 27). Malaysia's progress in green Investment: A General Overview. DFDL. https://www.dfdl.com/insights/legal-and-tax-updates/malaysias-progress-in-green-investment-a-general-overview/?utm_source=chatgpt.com

Tourism Malaysia. (2024). Tourism performance report 2023. https://www.tourism.gov.my.

Towards sustainable hospitality: Enhancing energy efficiency in hotels. (2024). International Research Journal of Economics and Management Studies, 3(6). https://doi.org/10.56472/25835238/irjems-v3i6p145

Tuan, L. T. (2021). Disentangling green service innovative behavior among hospitality employees: The role of customer green involvement. International Journal of Hospitality Management, 99, 103045. https://doi.org/10.1016/j.ijhm.2021.103045

Vermesan, O., Friess, P., Guillemin, P., Sundmaeker, H., Eisenhauer, M., Moessner, K., Gall, F. L., & Cousin, P. (2022). Internet of Things Strategic Research and Innovation Agenda. In Internet of things (pp. 7–151). https://doi.org/10.1201/9781003338659-2

Volkov, A. D., Roslyakova, N. A., Vasilieva, A. V., Averyanov, A. O., Tishkov, S. V., & Nalivaychenko, E. V. (2024). Preferential Regime of the Russian Arctic: Tendencies and First Results from Realization of the World's Largest Special Economic Zone. Journal of Risk and Financial Management, 17(1), 28. https://doi.org/10.3390/jrfm17010028

Xu, X., Lu, Y., Vogel-Heuser, B., & Wang, L. (2021). Industry 4.0 and Industry 5.0—Inception, conception and perception. Journal of Manufacturing Systems, 61, 530–535. https://doi.org/10.1016/j.jmsy.2021.10.006

Yang, J., Reza, M. N. H., Mamun, A. A., Masud, M. M., & Rahman, M. R. C. A. (2024). Predicting guest satisfaction and willingness to pay premium prices for green hotels. Humanities and Social Sciences Communications, 11(1). https://doi.org/10.1057/s41599-024-04024-y

Yang, X., Li, Y., & Chen, S. (2024). Predicting guest satisfaction and willingness to pay premium prices for green hotels: An empirical investigation. Humanities and Social Sciences Communications, 11, 4024. https://doi.org/10.1057/s41599-024-04024-y

Zweibelson, B. (2023). PART I: The Singleton Paradox: on the future of Human-Machine teaming and potential disruption of war itself. Journal of Advanced Military Studies, 14(1), 11–46. https://doi.org/10.21140/mcuj.20231401001.

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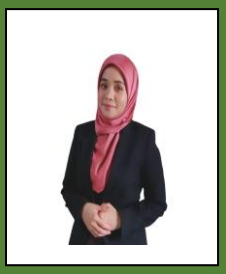

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