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THE MEDIATING ROLE OF CUSTOMER ENGAGEMENT IN LINKING SUSTAINABLE HOSPITALITY PRACTICES AND PERCEIVED VALUE TO CUSTOMER LOYALTY: EVIDENCE FROM SAUDI ARABIA'S VISION 2030 LUXURY HOTELS

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ABSTRACT

With the rise of environmental awareness and changing consumer preferences, the hotel industry is increasingly pressured to adopt sustainable practices. This study aims to create a sustainable hospitality SOR model. This model will include sustainable hospitality practices, consumer-perceived value, and customer engagement, all with the goal of increasing customer loyalty. A quantitative research method was used, involving a survey of hotel guests who have stayed at least once in the past year. PLS SEM was used to explore the direct and indirect relationship between variables. The study found that sustainable hospitality practices have a strong and significant impact on consumer perceived value and visitor loyalty. Furthermore, customer engagement acts as a mediator between green practices, perceived value, and visitor loyalty. These findings suggest that incorporating environmentally responsible practices into customer engagement strategies can boost long-term visitor loyalty. This research makes a theoretical contribution to the development of SOR sustainable hospitality models and provides practical implications for hotel management clearly articulated and measurable sustainable operating standards encompassing energy efficiency, resource conservation, and pro-environmental employee practices. Thus, strengthening the hotel's reputation as a responsible brand capable of delivering greater value.

KEYWORDS: Sustainable Hospitality, Green Practices, Customer Perceived Value, Loyalty, SOR.

1. INTRODUCTION

Luxury tourism and hospitality are increasing not just because more people want them, but also because tastes are changing. Luxury consumers are increasingly looking for unique, personalized, and immersive experiences that not only resonate with their ethical values but also with their values of sustainability (Weber, 2019; Streimikiene et al., 2021). The increasing awareness among consumers regarding the negative impacts of environmental degradation has led to a growing demand for green products, such as eco-friendly hotels (Berezan et al., 2013).

The Saudi tourism sector has demonstrated substantial growth recently. The Saudi Ministry of Tourism (2024) reported that tourism accounted for 12.4% of Saudi Arabia's GDP in 2024, nearly doubling its contribution from 2020 and exceeding the average for GCC nations. This has been essential in reducing dependence on oil and gas, as the growth in tourism provides alternative revenue streams and supports economic diversification efforts in the kingdom. In 2024, the kingdom of Saudi Arabia received 116 million visitors and generated 284 billion Saudi riyals in expenditures. Domestic travel constitutes the primary source of demand, with an estimated 86.2 million trips projected for 2024. Inbound arrivals are rising due to eased visa policies and improved air access, and tourism is growing by about 70% more than 2019 levels. At the same time, there is growing consumer awareness about environmental and social responsibility. Contemporary travelers seek more than mere opulence; they anticipate that luxury brands embody and promote sustainability values (Amatulli et al., 2021). In response, numerous luxury tourism providers have started to incorporate eco-friendly practices, such as utilizing renewable energy, supporting local communities, and implementing low-impact travel initiatives (McCarroll et al., 2024). Such strategies aim to find the right balance of indulgence and responsibility, thereby redefining the concept of luxury in the process.

This study aims to investigate how sustainability programs affect customer behavior in luxury hotels, particularly in relation to Saudi Arabia's Vision 2030. Although sustainability practices are becoming more common in tourism, it's still unclear how much these practices positively influence customers' perceptions and loyalty to luxury hotels.

Although many hotels adopt sustainable business practices, few studies examine how these practices

affect customers. It should also be noted that existing literature mainly concentrates on exploring direct links between practices and customer-related aspects without considering psychological mechanisms that underpin these relationships. This leaves gaps in knowledge both theoretically and practically. The current situation complicates the development of effective sustainability programs. A lack of understanding regarding psychological mechanisms hinders the creation of strategies that resonate with customer motivations and behaviors.

The Kingdom is currently diversifying its economy under Vision 2030 and is becoming a premium tourism destination. Sustainable hospitality is defined as "the implementation of strategies that minimize harmful effects on the environment without compromising social and economic benefits." The "green practices" in hotel and resort management, such as energy-saving equipment, waste-reduction schemes, water-saving schemes, sustainable procurement, and eco-certification, are now integral aspects of global sustainability policies. These practices reduce operational expenses and project a responsible corporate image that aligns with contemporary consumer values (Nawaz et al., 2024; Li et al., 2025).

The incorporation of sustainable practices (SP) in hospitality services is directly related to the concept of "customer-perceived value," which is defined as "a holistic measure of the utility of a product based on consumers' perceptions of the benefits obtained and the costs incurred" (Sweeney and Soutar, 2022). In terms of sustainable hospitality services, "customer-perceived value" includes functional value, emotional value, environmental value, and ethical value. Furthermore, customers assess hotels according to traditional service quality factors and the level of alignment of these organizations with their personal values and preferences (Osman and Sentosa, 2023).

The hotel industry has adopted several strategies to ensure that it meets the demands of sustainable development, such as the use of "eco-labels," "sustainable practices," and "environmental management systems" (Kang et al., 2012). The three aspects of sustainable practices, i.e., environmental practices, social practices, and economic practices, have a substantial impact on "customer-perceived value" and increase the willingness of customers to visit the same hotel again (Pereira-Moliner et al., 2021). The management of natural resources, reduction of energy and water consumption, and

implementation of waste minimization strategies have a significant impact on enhancing hotel reputation, given that customers are increasingly becoming sensitive to environmental concerns (Han and Hyun, 2018).

Prior studies indicate that sustainability practices affect customer perceptions of service value and their behavioral intentions, such as the probability of returning to the same hotel (Han and Hyun, 2018; Viet et al., 2020). Customer engagement has received considerable attention recently (Hollebeek et al., 2022), underscoring its role in promoting positive customer behaviors (Weng et al., 2022) and securing a competitive advantage (Pansari and Kumar, 2017) within the dynamic Saudi Arabian automotive market. Hotels' adoption of sustainable practices does not solely establish a direct relationship with customers' intention to return (Han et al., 2019). Mediating variables related to attitudes or emotions (Uludag et al., 2024) may influence this intention. In this context, customer engagement acts as a crucial mediating variable that connects the perception of sustainable practices to customer loyalty toward the hotel (Sun et al., 2022).

Customer loyalty (CL) refers to a favorable customer attitude toward a brand, which is primarily characterized by repeat purchases (Rather, 2018). Customer loyalty is a customer's consistent and lasting intention to purchase and consume a particular brand's offerings again, regardless of what situational factors and competitor marketing activities may be influencing that customer's decision (Đorđević and Miladinović, 2022). Customer loyalty represents psychological intent based on attitudes toward the brand and intention to make repeat purchases in the future (Upamannyu and Bhakar, 2014).

Customer engagement (CE) is one of the most prominent modern theoretical frameworks in the field of service marketing, as it describes the essence of the close interactive relationship between the customer and the organization, going beyond the usual exchange of benefits (Islam et al., 2021). Customer engagement refers to "the level of cognitive, emotional, and behavioral participation that a customer demonstrates towards a brand or service as a result of their experiences with it" (Brodie et al., 2011). This concept has special significance in the luxury hospitality industry, as customers are not only in search of quality services but also an experience that makes them feel special and provides them with a sense of belonging.

On the other hand, sustainable hotel practices contribute to enhancing the positive image and

trust among customers, and the high perceived value (PV) increases their satisfaction and appreciation of the service. Nevertheless, the influence of these two elements does not occur directly but through customers' engagement, which plays an intermediary role between these elements and customers' loyalty, such as repeat patronage and positive word-of-mouth (Vivek et al., 2012; Hollebeek et al., 2014). Accordingly, customers' loyalty increases when sustainability practices and perceived value increase their psychological and actual engagement with the hotel, as suggested by the study model, where customers' engagement plays an intermediary role between sustainability practices and perceived value and customers' loyalty.

The main objective of this study is to incorporate the SOR model to verify the effect of sustainable hospitality practices and perceived value (stimuli) on customer loyalty (response) throughout the customer engagement (organism) in Saudi luxury hotels. As shown in figure 1, the contribution of this study lies mainly in employing the SOR model as the main theoretical framework to explain how sustainable hotel practices and perceived value transform into customer loyalty in the luxury hotel sector. Instead of assuming the relationship between these variables, the study presents a model that illustrates how customer engagement functions as the mechanism through which sustainability and value influence loyalty behavior. The study offers a theoretical contribution to the expansion of the scope of the SOR model within the context of luxury hospitality, highlighting the importance of the Stimulus, Organism, and Response connection between the guest and the hotel as the key factor in converting experiences into relationships.

The study also offers a significant contribution to literature by filling the gap in the way in which sustainability and perceived value are integrated within the context of the customer engagement theory, which is still in its infancy within the emerging tourism environments. From a practical standpoint, the study's findings provide practical implications for luxury hotel managers regarding the importance of designing interactive and personalized experiences that enhance guests' engagement, rather than simply improving service quality or adopting environmentally friendly practices. Additionally, the study offers empirical evidence from the context of Saudi Arabia under Vision 2030, elucidating the role of customer engagement as a strategic instrument for attaining

competitiveness and sustainability in aspirational tourist destinations.

Various studies indicate that green hotel practices can lower operational expenses, boost profits, enhance guest satisfaction and loyalty, support environmental sustainability, and provide a competitive edge (Buunk and van der Werf, 2019). However, there is a notable lack of empirical research regarding the impact of these practices on achieving sustainable development goals, particularly in developing nations. Therefore, this study's proposed Sustainable Hospitality Model integrates green practices with customer-perceived value to elucidate the formation of guest loyalty. By exploring the pathways through which environmental initiatives enhance perceived value and subsequently influence loyalty, this research aims to provide a thorough understanding of sustainable service delivery within the hospitality sector. Additionally, the model offers practical implications for hotel managers and tourism practitioners who are looking to develop effective sustainability strategies that promote long-term customer relationships and create a competitive edge in an increasingly environmentally conscious market.

The purpose of this research is to explore the effect that sustainable practices in the hospitality industry have on customer loyalty in Saudi luxury hotels, with mediators being customer value perceptions and customer engagement. The research will adopt the Stimulus-Organism-Response Model with a view to explaining the process that drives sustainability activities to better customer relationships and competitiveness.

1.1. Problem Statement

Although efforts continue to be made to embrace sustainable tourism in Saudi Arabia as part of its Vision 2030, the major problem facing luxury hotels in Saudi Arabia today is the evaluation of the effects of sustainability practices on customer behavior. Many hotels undertake sustainability practices in their organizations, yet there exists scanty research on the effects of such initiatives.

Furthermore, past literature has largely concentrated on the benefits derived from sustainable strategies toward customer satisfaction and loyalty without considering the behavioral motivations behind such behaviors. Ignoring these

motives poses certain challenges to researchers as well as to the managers who are responsible for implementing sustainability within hotels. From the researcher's perspective, it becomes difficult to develop a model that explains customer behavior with regard to sustainability. On the other hand, hotel managers may struggle when developing their sustainability policies because of not knowing how to increase customer involvement and loyalty, which can lead to ineffective strategies that fail to engage customers in sustainable practices, ultimately resulting in lower customer satisfaction and reduced environmental impact.

1.2. Research Objectives

This study attempts to achieve the following objectives:

- RO1: To investigate the impact of sustainable hospitality practices on customer-perceived value.
- RO2: Investigate the effects of sustainable practices on consumer engagement.
- RO3: To examine the relationship between customer-perceived value and customer engagement.
- RO4: To explore whether customer engagement serves as a mediating factor in the relationship among sustainable practices, perceived value, and customer loyalty.

1.3. Research Gap.

This study fills numerous significant gaps in the existing literature.

Contextual Gap: There is a scarcity of empirical research on sustainable hospitality practices in emerging nations, notably in Saudi Arabia and its fast-rising tourist industry under Vision 2030.

Theoretical Gap: In the field of hospitality research, there has been limited focus on customer involvement as a mediating factor that connects sustainable practices, customer-perceived value, and customer loyalty. **Modeling Gap:** Previous research has mostly focused on direct correlations between sustainability practices and consumer results, ignoring the underlying psychological processes reflected in the SOR model's organism component, such as how consumers' emotions and perceptions influence their responses to sustainable practices.

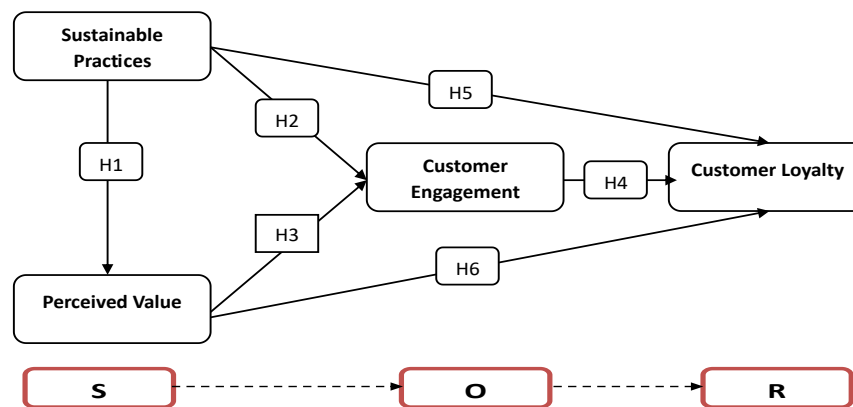


Figure 1: The Conceptual Framework

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical Background

The Stimulus-Organism-Response (S-O-R) paradigm developed by Mehrabian and Russell in 1974 suggests that the internal feelings or behavior of an organism (person) are caused by the external environment (stimuli). This internal stimulus processing can be conscious or unconscious, including perceptions and environmental interpretations that influence someone's feelings and decisions. This influence further triggers an emotion that leads to a response (Mehrabian and Russell, 1974; Guo et al., 2022). Here, a stimulus refers to an external factor, which represents, for instance, a marketing mix; an organism refers to an internal process or structure such as an individual's emotions and feelings that intervene between the stimulus and the organism's response; and a response represents an external behavior due to the stimulus as well as the organism's internal reaction (Cho et al., 2019).

Prior studies have explored various factors affecting one's behavioral intentions using an SOR model. Asl and Khoddami (2022) investigated green purchase behavioral intentions with an SOR model that combines the theory of planned behavior and the theory of consumption values. The variables used for the current study are as follows: sustainable hospitality practices (SP) and perceived value (PV) were used as the stimulus, customer engagement (CE) was used as the organism, and customer loyalty (CL) was chosen as the response.

Chen et al. (2022) explored the SOR model in sustainable hospitality by identifying perceived destination attributes as stimuli and analyzing memorable tourism experiences, emotions, loyalty, and word-of-mouth intention as responses.

Similarly, Chen and Huang (2012) applied the SOR framework in online contexts, with active control and reciprocal communication/social identity as stimuli, and focused on affective involvement and flow as organisms, leading to cognitive involvement and purchase intention as responses regarding social functions and online product purchases.

Peng and Kim (2014) used the SOR framework to investigate how consumers' hedonic shopping value, utilitarian shopping value, and environmental stimuli affect their repurchase intention, which mediates individuals' attitudes toward online shopping and emotional purchases. Ric and Benazić (2022) used interactivity as a stimulus, motivation to use as an organism, and brand awareness and purchase intention as the responses to characterize the impact of 'likes,' comments, and shared forms of interactions on consumers' shopping behaviors.

Past research has employed the extended SOR model to forecast consumer behavior by adding variables like cognition and perceived service quality (Jacoby 2002). The SOR theory has effectively predicted user behavior in information and communication technologies, particularly in areas such as impulsive buying in mobile auctions (Chen and Yao 2018), customer engagement in online brand communities (Islam and Rahman 2017), cocreation in social media (Kamboj et al. 2018), online shopping behavior (Peng and Kim 2014), and customer loyalty in online social commerce (Wu and Li 2018).

2.2. Sustainable Hospitality Practices and Perceived Value

Sustainable Luxury Hospitality (SLH) integrates environmental, social, and cultural sustainability into high-end hospitality, emphasizing exclusivity, comfort, and quality (Gurung et al., 2025). There is debate among scientists on whether this integration

represents a significant paradigm shift or merely a strategic rebranding to meet evolving customer expectations (Cutuleac et al., 2024). Sustainable hospitality seeks to lessen the harm that people do to the environment while increasing the benefits to society and the economy. Key practices include green technology, waste reduction, water conservation, and eco-labeling, which are essential for global environmental conservation efforts (Nawaz et al., 2024; Li et al., 2025).

In Saudi Arabia, the Vision 2030 initiative seeks to diversify the economy and establish the country as a premium tourism destination, leveraging its rich cultural heritage and natural beauty (Emam and Ali-Dinar, 2024). However, balancing luxury with environmental sustainability poses challenges, as stakeholders must navigate the shifting perceptions of tourists (Ramazanovna et al., 2024; Tolunay and Muskara, 2024).

Consumer behavior regarding sustainable tourism is complex, as individuals may express commitment without corresponding actions, often due to factors such as convenience, cost, and lack of awareness about sustainable options (Hu et al., 2025). Green practices in the hotel industry are diverse and involve various methodologies. Kim, Lee, and Fairhurst (2017) characterize green practices as a value-added approach that improves hospitality operations via environmental protection initiatives. Rahman et al. (2012) define "green" as environmentally friendly practices that reduce waste and conserve energy. Myung et al. (2012) stress that green practices try to protect the environment by using less waste and eco-friendly materials. Wolfe and Shanklin (2001) characterize green hotel practices as those that minimize environmental impact through recycling and eco-purchasing. Kostic et al. (2019) note that green hotels focus on water and energy conservation and waste reduction, leading to cost savings and environmental protection. Manaktola and Jauhari (2007) further describe these hotels as less environmentally harmful, actively engaging in conservation efforts such as implementing energy-efficient systems, reducing water usage, and promoting sustainable practices among guests.

There are more value-conscious customers now, and perceived value is more important in marketing (Buunk and der Werf, 2019).

Perceived value is traditionally defined as a consumer's evaluation of a product's utility based on received versus given aspects, which in green consumption also incorporates environmental factors (Wang et al., 2024). It represents a benefit-cost

tradeoff (Jiang and Kim, 2015) and includes perceived green benefits, such as healthier environments and social recognition (Merli et al., 2019; Yu et al., 2024). Zeithaml et al. (1988) emphasize that perceived value is crucial for customer-provider relationships, characterized by a consumer's assessment of a product's usefulness (Ryu et al., 2008; Zeithaml et al., 1988). Roh et al. (2022) identify dimensions of perceived value, including functional, social, emotional, and epistemic values. The concept of green perceived value has emerged, defined as a consumer's overall appraisal of the net benefits of a product based on environmental desires and sustainable expectations (Han, 2021).

According to Han (2021), buyers are more inclined to value green products when they perceive greater benefits than costs, particularly in terms of performance. In the hospitality sector, there is limited empirical research on the relationship between hotels' eco-friendly practices and consumers' perceived value. Han et al. (2018) examined the perceptions of green hotel customers regarding water conservation and waste management, revealing that these practices augment guests' perceived value. Additionally, experiences related to sustainability, such as consuming local and organic foods and staying in eco-designed accommodations, have been linked to increased support for green initiatives and customer loyalty.

This study builds on earlier findings by emphasizing explicitly green experience value as a unique category and investigating the effect of sustainable hospitality practices in sustainable luxury hotels (Mishra, 2019).

Thus, we suggest the following hypothesis:

H1: Sustainable hospitality practices positively influence Green Perceived Value

2.3. Sustainable Hospitality Practices, Perceived Value, And Customer Engagement

Customer engagement encompasses a customer's physical, cognitive, and emotional presence with an organization, reflecting their participation and connection with its offerings (Vivek et al., 2012). Verhoef et al. (2010) highlights the importance of customer interaction for enterprises, while Vivek et al. (2009) describes it as an emotional link based on customer involvement. Vivek et al. (2019) further define it as the strength of consumer connection with a company's products and activities. Hollebeek (2011) approaches customer engagement from a psychological perspective, linking it to consumer motivation and memory, which influences future interactions with the brand. Brodie et al. (2011) also

emphasizes the role of perceived value and meaningful interactions in co-creating value. Kumar et al. (2010) provides a method to quantify customer engagement, identifying dimensions such as retention, referrals, social impact, and knowledge sharing.

Recent studies highlight that sustainable practices in the hospitality sector serve as a strategic tool to enhance customer-perceived value and brand connection. Obeng et al. (2025) found that these practices boost perceived value through environmentally friendly employee behaviors, such as reducing waste and promoting energy efficiency, which resonate with customers' values and enhance their overall experience. Dedat and Rodrigues (2025) demonstrated that customers' perceptions of hotel sustainability positively influence loyalty and re-visit intentions, mediated by perceived value. Xu et al. (2025) identified perceived value as a key predictor of intentions to re-stay in green hotels, linked to customer satisfaction. Manthé et al. (2025) confirmed that green hotel activities positively affect customer behavior by fostering trust and gratitude, leading to increased engagement. Additionally, Safeer et al. (2025) established that corporate social responsibility legitimacy and brand environmental understanding strengthen customer loyalty through consistent behavioral patterns, which can lead to higher rates of repeat visits and positive word-of-mouth recommendations.

Recent studies have indicated that the incorporation of innovation and sustainability in hotel services can increase customers' satisfaction and value of the experience, which can eventually impact customers' willingness to make recommendations for the hotel (Farinha et al., 2026). In general, the mentioned studies have indicated that the implementation of sustainability in hotel establishments can indirectly impact customers' engagement by increasing the value and satisfaction of the experience. Thus, the following hypotheses were developed:

H2: Sustainable hospitality practices positively influence customer engagement.

H3: Perceived value positively influences customer engagement.

2.4. Customer Engagement and Customer Loyalty

Jana and Chandra (2016) and Morgan and Govender (2017) highlight the growing recognition of customer loyalty's benefits for both customers and businesses. Customers experience reduced risks in choosing organizations (Polo et al., 2013), save time

in product evaluation (Yang and Peterson, 2004), and avoid lengthy learning processes. Loyal customers are more cost-effective to retain, less sensitive to price increases, and often promote the brand positively (Cossío-Silva et al., 2016). It is also considered a valuable intangible asset for organizations, contributing to their effectiveness by enhancing customer retention, improving brand reputation, and increasing overall profitability (Nyadzayo and Khajehzadeh, 2016).

The marketing literature has extensively explored customer loyalty, including its origins, dimensions, and consequences (Dick and Basu, 1994; Oliver, 1999; Kamran et al., 2017). Recent research has concentrated on the significance of customer interaction in cultivating loyalty (Thakur, 2016; Kosiba et al., 2018; Moliner et al., 2018; Parihar et al., 2019). Customer behaviors, influenced by their engagement level with a brand, include purchases, recommendations, discussions, feedback, and suggestions for improvement (Pansari and Kumar, 2017). In the end, customer loyalty can be seen as either buying from the same brand again or having a positive opinion of it (Kamran et al., 2017).

Assessing loyalty through repeat purchases is methodologically challenging, as it relies on explaining past behavior with psychological traits measured later. Dick and Basu (1994) suggest that frequent purchases may not indicate true loyalty. Instead, attitudinal loyalty, which reflects a consumer's psychological inclination towards a brand, is a more reliable predictor of future behavior (Roy et al., 2018). Pansari and Kumar (2017) note that consumer loyalty results from customer engagement, which Bowden (2009) and van Doorn et al. (2010) link directly to loyalty. Harrigan et al. (2018) assert that engagement predicts brand usage intention, while Pansari and Kumar (2017) describe customer engagement as an emotional connection that fosters loyalty. Thus, we propose that.

H4: Customer engagement positively influences customer loyalty.

2.5. The Mediation Role of Customers' Engagement Between Sustainable Hospitality Practices, Perceived Value, And Customer Loyalty

Kahn (1990) introduced the concept of engagement and its psychological foundations, prompting organizations to adopt customer engagement programs in response to resistance against traditional marketing (Bagozzi and Dholakia, 2006). Since 2005, "engagement" has become common in marketing literature, yet comprehensive

definitions remain limited (Brodie et al., 2011; Vivek et al., 2012). A recent study highlights that client engagement is crucial for linking sustainable hospitality practices to customer loyalty, often influenced by perceptions of an organization's sustainability commitment (Saraiva et al., 2020). Hotels that promote their green initiatives enhance guests' environmental awareness, leading to increased pro-environmental behaviors (Sharma et al., 2024; Qasim et al., 2023). Consumer engagement has been identified as both a precursor and an outcome in marketing contexts (Hollebeek et al., 2019), particularly in how it relates to fostering customer loyalty through sustainable practices in the hospitality industry.

Some research has used CE as a mediator. For instance, Vivek et al. (2012) established that CE is a mediator for consumer participation, involvement, and brand loyalty. Abou-Shouk and Soliman (2021) established that CE moderates gamification adoption intention, brand awareness, and loyalty. Besides that, research has shown that consumer participation in sustainable activities in the hotel industry has positive environmental consequences and sustainable corporate practices (Velo and Gomez Suarez, 2023). According to literature, consumers who perceive that hotels are environmentally friendly are likely to exhibit sustainable consumption practices such as purchasing green products and engaging in environmental activities organized by the hotel (Khan et al., 2024). Therefore, it is anticipated that:

H5: Sustainable hospitality practices are directly related to customer loyalty.

H6: Perceived value is directly related to customer loyalty.

H7: Customer perceived value mediates the relationship between sustainable hospitality practices and customer engagement.

H8: Customers' engagement mediates the relationship between sustainable hospitality practices and customer loyalty.

H9: Customers' engagement mediates the relationship between Perceived Value practices and customer loyalty.

3. METHODOLOGY

3.1. Research Design

This study examines the role of sustainable hospitality practices and aims to enhance customer-perceived value and customer loyalty through customer engagement. The study's sample population comprises hotel chain customers in KSA. This study utilized a survey to collect data, employing scales that have undergone validity and reliability testing in prior research. Data for the study were collected using an online self-report questionnaire. All items were evaluated utilizing a 5-point Likert scale. In the second section,

3.2. Sample And Data Collection

The convenience sampling method, a non-probability approach, was utilized for data collection. Participants were also informed of confidentiality assurances and that their participation was voluntary. To reduce the risk of common method bias (CMB), questions were formulated to limit the predictability of the overall study model (Podsakoff et al., 2003). A full collinearity assessment was conducted in accordance with Kock (2015) recommendations for PLS SEM to identify potential bias.

This study utilized the priori sample size calculator proposed by Soper (2020) for structural equation modeling. The study determined a minimum sample size of 297, based on 4 observed variables, 15 latent variables, an anticipated effect size of 0.30, a desired statistical power of 0.95, and a significance level of 0.05. Ringle et al. (2015) propose that increasing the number of predictors by a factor of three improves the consistency of the research model. A total of 340 responses were collected in the study. After a thorough analysis and data cleaning process, 305 responses were considered valid for inclusion.

The demographic analysis in table (1) shows that most of the people who answered are women, making up 53.4% of the total. The predominant age group is 25-35, forming 30.2% of the population, followed by the 36-45 age group at 27.9%. The majority of education levels were holding bachelor's degrees, forming 42%, with the frequency of staying in luxury hotels varying from 1-2 times at 31.5% to more than 12 at 9.8%.

Table 1: Demographic Characteristics.

Variable	Category	n	%
Gender	Male	142	46.6%
	Female	163	53.4%
Age	Under 25	18	5.9%
	25-35	92	30.2%
	36-45	85	27.9%

	46-55	70	23.0%
	Above 55	40	13.1%
Education Level	High school	54	17.7%
	Diploma	63	20.7%
	Bachelor's degree	128	42.0%
	Master's degree	45	14.8%
	Doctorate	15	4.9%
Frequency of Staying in Luxury Hotels (Past 12 Months)	1-2 times	96	31.5%
	3-5 times	88	28.9%
	6-8 times	56	18.4%
	9-11 times	35	11.5%
	More than 12	30	9.8%
Total		305	100%

3.3. Analysis Of Data

The developed model was tested using partial least squares structural equation modeling (PLS-SEM). This study employs PLS-SEM for several reasons. Hair et al. (2017) recommend using PLS-SEM when the moderator variable is measured as a continuous variable in the model. Hair et al. (2017) indicate that PLS-SEM is applicable for both predictive and explanatory models. Considering the aforementioned factors, Partial Least Squares Structural Equation Modeling (PLS-SEM) was chosen as the analytical method for evaluating the proposed model. The analysis was conducted using SmartPLS 4 (Ringle et al., 2024).

Furthermore, to assess the significance of the mediating influence, the two-stage procedure proposed by Hair et al. (2017) was utilized. While PLS-SEM demonstrates robustness with small sample sizes, it is crucial to adhere to the minimum sample size requirements to attain the necessary levels of effect and statistical significance. PLS-SEM, like other analytical techniques, necessitates a sufficient sample size to ensure reliable results (Sarstedt et al., 2017).

A data screening process was conducted prior to the PLS-SEM analysis (Hair et al., 2013). Initially, the analysis focused on the examination of missing values. No missing values were identified. Secondly, Mahalanobis distance was analyzed to identify extreme outliers. The Mahalanobis distance analysis revealed no extreme outliers (Hair et al., 2013). The assumption of normal distribution was ultimately verified. Given that the sample size exceeded 250, the absolute values of skewness and kurtosis were taken into account. The skewness and kurtosis values

adhered to the established cut-off criteria, thereby confirming the assumption of normal distribution (Curran et al., 1996).

4. RESULTS

4.1. Inner Model

The reliability of the indicators demonstrated excellent reliability and convergent validity. The results of table (2) show that the standardized loading for each indicator exceeded 0.70, which is an acceptable value (Hair et al., 2021). Cronbach's α and the composite reliability test were used to assess internal consistency reliability, as indicated in table 2. Cronbach's α ranged from 0.831 to 0.861 and composite reliability from 0.836 to 0.863, which surpass the recommended thresholds (Hair et al., 2021).

Furthermore, According to Hair et al. (2021), when AVE is extracted, all values should exceed 0.50. The results of table 2 show that AVE for CE, CL, PV, and SP were 0.747, 0.748, 0.707, and 0.643, respectively, which surpass the recommended thresholds (Hair et al., 2022). The AVE square root was used to determine discriminant validity. To evaluate discriminant validity, the study utilized the "Heterotrait-monotrait (HTMT) ratio" and the Fornell-Larcker criterion. According to Henseler et al. (2015), the "Heterotrait-monotrait (HTMT) ratio" is a more accurate measure of discriminant validity while using smart PLS, and it should be less than 0.85, while the Fornell-Larcker criterion is the square root of the average variance extracted (AVE) for each construct should exceed its correlation with any other construct in the mode (Ha et al., 2023; Fornell and Larcker, 1981). See table 3.

Table 2: Convergent Validity.

Construct	Item	Factor loading	Cronbach's Test	VIF	AVE	CR
Customer Engagement (CE)	CE1	0.880	0.831	1.945	0.747	0.836
	CE2	0.869		2.000		
	CE3	0.843		1.811		
Customer Loyalty (CL)	CL1	0.851	0.833	1.802	0.748	0.842
	CL2	0.914		2.564		

	CL3	0.826		1.933		
Perceived Value (PV)	PV1	0.802	0.860	2.118	0.707	0.863
	PV2	0.806		1.837		
	PV3	0.830		1.971		
	PV4	0.918		3.534		
Sustainable Practices (SP)	SP1	0.823	0.861	2.097	0.643	0.862
	SP2	0.794		1.846		
	SP3	0.828		2.106		
	SP4	0.817		1.961		
	SP5	0.745		1.599		

The results showed that the HTMT value was below the 0.85 threshold, proving the construct's discriminant validity (Hair and Sarstedt, 2021; Mansoor et al., 2025). While the results for Fornell-Larcker indicated that the discriminant validity

requirement is met, as the square root of the AVE is in excess of the correlation coefficient of other variables as depicted in table 3. (Fornell and Larcker, 1981)

Table 3: Discriminant Validity.

Fornell-Larcker					HTMT				
Variables	CE	CL	PV	SP	Variables	CE	CL	PV	SP
CE	0.864				CE				
CL	0.618	0.865			CL	0.737			
PV	0.599	0.412	0.841		PV	0.705	0.476		
SP	0.701	0.567	0.691	0.802	SP	0.824	0.665	0.801	

Notes: CE: Customer Engagement; CL: Customer Loyalty; PV perceived Value. SP: Sustainable Practices

4.2. Outer Model and Hypothesis Testing

Understanding how constructs interact within the study framework requires assessing their relationships (Henseler et al., 2015). This assessment focuses on path coefficients, t-values, p-values, and confidence intervals (CIs), which show the strength, significance, and reliability of the relationships between variables. Bootstrapping with 10,000 samples is used to test study hypotheses. To further interpret the study's findings, we used Cohen's f² effect size analysis to evaluate the practical importance of each relationship we examined. Cohen's f² is a common way to measure effect size, with values ranging from 0.02 to 0.35, which indicates small, medium, or large effects (Fey et al.,

2023).

The results obtained in the hypothesis testing of this study have shed some light on the impact of sustainable hospitality practices and perceived value in terms of their influence on customer loyalty in the hospitality industry in Saudi Arabia. Figure (2) shows the first hypothesis was found to be true by having the highest value for the path coefficient ($\beta = 0.691$, t-value = 25.199, $p < 0.001$), along with the confidence interval being in the range of [0.630, 0.739]. This has also been validated by the results obtained in the effect size (f²), which showed that SP has a significant impact on PV (f² = 0.914), thereby validating the fact that sustainability practices are one of the key determinants in assessing consumer value.

Table 4: Path Analysis.

Relationship	β	t-value	p-value	LLCI	ULCI	f ²	Result
SP -> PV	0.691	25.199	0.000	0.630	0.739	0.914	Supported
SP -> CE	0.550	10.210	0.000	0.443	0.653	0.327	Supported
PV -> CE	0.219	3.683	0.000	0.100	0.330	0.052	Supported
CE -> CL	0.447	6.756	0.000	0.312	0.570	0.166	Supported
SP -> CL	0.294	3.943	0.000	0.145	0.439	0.059	Supported
PV -> CL	-0.060	0.926	0.354	-0.181	0.067	0.003	Not Supported
SP -> PV -> CE	0.152	3.636	0.000	0.070	0.232		Supported
SP -> CE -> CL	0.272	4.916	0.000	0.165	0.380		Supported
PV -> CE -> CL	0.098	3.023	0.003	0.043	0.170		Supported

The second and third hypotheses have also been validated by having a significant impact of SP and PV on CE by having values for the path coefficients of (β

= 0.550, t-value = 10.210, $p < 0.001$) and ($\beta = 0.219$, t-value = 3.683, $p < 0.001$), along with the confidence intervals being in the range of [0.443, 0.653; 0.100,

0.330], respectively. These results indicate that the more sustainable practices and perceived value increase, the more customer engagement rises, which confirms H2 and H3. Moreover, SP demonstrated a moderate-to-large effect on customer engagement (CE) ($f^2 = 0.327$), underscoring its importance in fostering customer involvement. Conversely, PV exhibited a minor influence on CE ($f^2 = 0.052$), suggesting that, although perceived value may enhance participation, its actual impact is relatively limited when contrasted with sustainable behaviors.

The fourth hypothesis posits a positive relationship between customer engagement and customer loyalty, as indicated by a path coefficient of ($\beta = 0.447$, t -value = 6.756, $p < 0.001$), and a confidence interval ranging from [0.312, 0.570]. This finding suggests that customer engagement, which represents the concluding phase of sustainability practices, serves as a predictor of customer loyalty.

The fifth and sixth hypotheses investigate the direct relationship between the sustainable practices, perceived value, and customer loyalty. This relationship is similarly supported, with path coefficients of ($\beta = 0.294$, t -value = 3.943, $p < 0.001$); and ($\beta = -0.060$, t -value = 0.926, $p < 0.001$), and CIs of [0.145, 0.439; -0.181, 0.067], respectively. The results demonstrate the direct relationship between sustainable practices and customer loyalty, which confirms H5. However, on the contrary, the relationship between perceived value and customer loyalty was negative and insignificant, which confirms the rejection of the sixth hypothesis.

The small direct effect of SP on loyalty ($f^2 = 0.059$) suggests that its influence is mainly indirect, rather than direct. The effect of PV on CL is also small ($f^2 = 0.003$), which is consistent with the structural model's finding of no direct relationship.

4.3. Mediation Analysis

The assessment of the mediation relationships helps to enhance our understanding of the important role played by the concept of engagement. Bootstrapping with 10,000 subsamples was used to assess the mediation effect (Hair et al., 2022). The seventh hypothesis proposes that customer perceived value acts as a mediator between the relationship of sustainable hospitality practices and customer engagement. The path coefficient was ($\beta = 0.152$, t -value = 3.636, $p < 0.001$), and CI [0.070, 0.232], which shows that there is partial mediation and hence supports H7.

The eighth hypothesis investigates that customer engagement acts as a mediator between the relationship between sustainable hospitality practices and customer loyalty. The path coefficient was ($\beta = 0.272$, t -value = 4.916, $p < 0.001$), and CI [0.165, 0.380], which shows that there is partial mediation and hence supports H8. On the other hand, the ninth hypothesis proposes that customer engagement acts as a mediator between the relationship between perceived value and customer loyalty. The path coefficient was ($\beta = 0.098$, t -value = 3.023, $p < 0.003$), and CI [0.043, 0.170], which shows that there is full mediation, where perceived value does not have a direct effect on loyalty but is entirely mediated by customer engagement.

These results of H8 and H9 indicate that customer loyalty is not achieved solely through their perception of value; it also requires stimulating their interaction and actual connection with the hotel. Therefore, enhancing customer engagement strategies is a crucial factor in transforming perceived value and sustainable practices into genuine and lasting loyalty.

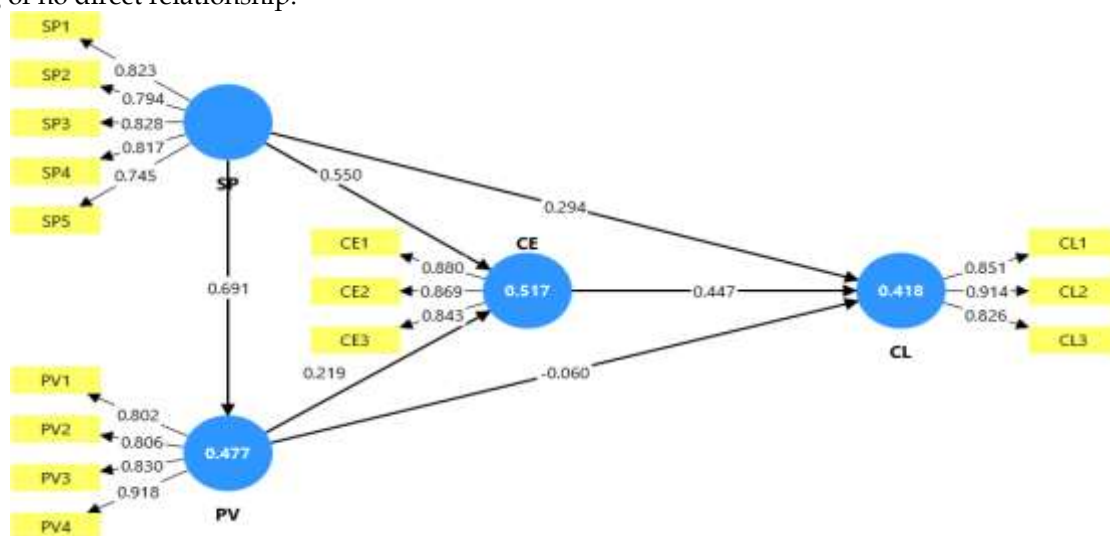


Figure 2: Model Path Analysis.

4.4. Predictive Assessment

The PLSpredict approach (Shmueli et al., 2019) was used to assess the model's predictive usefulness outside of the sample set. The predictions shown in Table 5 for PV, CE, and CL are all higher than zero, indicating predictive significance. The predictive ability of the results, Q^2 , shows that the model has predictive validity. This is because all the Q^2 values are higher than zero but less than one. The perceived value was 0.472, customer engagement was 0.488, and customer loyalty was 0.315. This shows that the model can predict dependent variables at a moderate

to high level.

On the other hand, the fit quality indicators showed that the SRMR value was 0.061, which is below the acceptable threshold (0.080), indicating a good fit quality between the model and the data. The NFI index recorded a value of 0.860, reflecting an acceptable level of fit despite not reaching the ideal level. In general, these results confirm that the model possesses acceptable predictive and matching capabilities, supporting its validity for analyzing and interpreting the relationships between variables (Henseler et al., 2015).

Table 5: Predictive Relevance (Q^2).

Constructs	Positive Word-of-Mouth
PV	0.472, (< 1, > 0)
CE	0.488, (< 1, > 0)
CL	0.315, (< 1, > 0)
SRMR	0.061, (< 0.080)
Chi-square	424.687
NFI	0.860

5. DISCUSSION AND IMPLICATIONS

5.1. Conclusion

This study highlights the importance of sustainable practices in fostering client loyalty within the hotel industry, particularly as environmental awareness increases. Green initiatives, such as energy-efficient technologies and sustainable sourcing, serve as competitive advantages for hotels. The adoption of certified sustainability measures, like LEED or Green Key accreditation, can attract environmentally conscious guests who are likely to return and promote the hotel. The SEM-PLS analysis confirms that green experiences enhance visitor loyalty, with perceived value and emotional satisfaction playing crucial roles in guest commitment to green hotels. Notably, sustainable practices in Saudi Arabian luxury hotels significantly enhance consumer perceptions of value, aligning with global trends in the hospitality sector. Luxury hotel consumers now prioritize environmental, social, and ethical practices alongside service quality, reinforcing the idea that sustainability is a key differentiator in consumer value perception (Jan et al., 2023; Kreinin and Aigner, 2022).

The mediating effects of perceived value on the relationship between sustainable practices and customer engagement highlight the psychological processes involved. Findings indicate that green practices enhance perceived value, leading to increased customer engagement, supporting Abdou et al. (2022)'s assertion that consumer behavior is influenced by value exchange. Additionally,

engagement is identified as a key factor in loyalty for luxury hotels, aligning with Zhang et al. (2024) and Pansari and Kumar's (2017) consumer engagement paradigm, which links engagement to loyalty. Customer loyalty, often measured by repeat purchases, is complex and involves psychological characteristics (Kamran et al., 2017). Furthermore, consumer engagement acts as a significant mediator between sustainable practices, perceived value, and customer loyalty, illustrating that engagement encompasses customers' thoughts, feelings, and actions towards the hotel, ultimately fostering loyalty through enhanced perceived value.

The studies by Rather et al. (2019) and Galvani et al. (2025) highlight the importance of consumer perceptions of sustainability in fostering emotional connections to brands, which enhances customer engagement and loyalty. In the hospitality sector, guests who feel integrated into their hotel experience are more likely to return and recommend the establishment, with perceived value being a significant predictor of loyalty. So et al. (2014) further emphasize that perceived value influences the relationship between experience quality and consumer behavior, particularly in luxury markets with high expectations. The Saudi context, especially under Vision 2030, underscores the necessity for luxury hotels to adopt sustainable practices as a competitive strategy to attract environmentally conscious consumers, aligning with the growing trend of sustainable tourism.

The findings indicate that sustainable practices indirectly enhance customer loyalty more effectively

than direct methods, highlighting the importance of integrated models in understanding consumer behavior. Customer engagement plays a crucial role in fostering relationships through positive interactions. This study contributes to theoretical development by incorporating sustainability, perceived value, and customer engagement within the SOR model, as outlined by Vergura et al. (2020), which analyzes the effects of external stimuli on psychological states and behaviors. For hotel managers, these insights reveal the potential of green policies to boost customer loyalty beyond ethical considerations, serving as a means to enhance customer involvement and foster lasting loyalty. The study also shows that green practices are more effective in promoting civic engagement than in driving transactional loyalty, suggesting that consumers are inclined to support businesses that advocate for sustainability and participate in community environmental efforts (Wang et al., 2024).

The study's findings ultimately corroborate the notion that cultivating loyalty in luxury hospitality necessitates a holistic strategy. This approach connects sustainability, value, and engagement. These elements work together to create a unique and lasting customer experience, which aligns with global trends and the goals of Vision 2030, such as enhancing customer satisfaction, promoting sustainable practices, and fostering community engagement in the luxury hospitality sector.

5.2. Theoretical Implications

The study highlights the effectiveness of the Stimulus-Organism-Response (S-O-R) model in analyzing luxury hotel guests' behaviors in Saudi Arabia regarding sustainable hospitality practices (Nunthiphatprueksa and Suntrayuth, 2018). Sustainable practices (stimulus) influence customer perceptions, which shape their internal state (organism) reflected in perceived value and customer engagement, leading to behavioral and attitudinal loyalty (response). The findings indicate that sustainable activities like resource conservation and emission reduction significantly impact consumer impressions, being seen as symbols of quality and ethics. Additionally, perceived value and customer engagement are crucial in understanding how stimuli affect responses, with perceived value relating to cognitive evaluations and customer engagement reflecting emotional and behavioral commitment to the hotel brand (Suess and Mody, 2018).

The findings highlight that customer engagement, a psychological state involving cognitive, emotional,

and behavioral interactions, is vital for strengthening customer-brand connections and fostering long-term loyalty (Chen et al., 2015; Lin et al., 2020; Suess and Mody, 2018). Loyalty is portrayed as a result of consumer interactions with sustainable practices, influenced by perceived value and engagement, extending beyond purchases to include referrals and ongoing brand support, aligning with Balaji et al.'s (2019) view of loyalty as a multifaceted condition. The relationship between sustainable policies and customer loyalty is complex, mediated by perceived value and interaction, suggesting that customers evaluate environmental factors before forming behavioral assessments. This is particularly relevant in the luxury hospitality sector, where sustainability initiatives enhance hotel reputation and foster deeper customer engagement.

The findings align with Parihar et al. (2019), emphasizing that customer engagement is crucial for building lasting relationships and mutual value. They highlight the role of Saudi Arabia's Vision 2030 in promoting sustainability in tourism and hospitality, where sustainable practices are now essential for luxury hotels. Sustainability has shifted from an option to a competitive standard affecting customer perceptions. The study shows that interactive experiences, such as environmental programs and workshops, effectively support sustainable policies (Su et al., 2017). It also stresses the importance of aligning hospitality experiences with customer values and the institution's mission (Baghi and Gabrielli, 2019). Ultimately, the research presents a model illustrating how sustainable practices influence perceived value and consumer engagement, leading to loyalty, providing valuable insights for managers and policymakers in the context of Vision 2030.

5.3. Practical Implications

The study highlights the importance of integrating sustainable practices into the corporate strategies of luxury hotels in Saudi Arabia, emphasizing that sustainability is a key factor for competitive advantage in global tourism markets. It broadens the concept of value to include environmental and social considerations, urging hotel management to adopt proactive strategies that enhance their reputation as responsible brands. Consumer engagement is identified as crucial for linking sustainability practices to customer loyalty, necessitating a shift from traditional consumer models to interactive ones that emphasize customer contributions to value creation. Developing participatory sustainability programs and effective

communication strategies is essential for fostering emotional connections and long-term relationships with guests. The findings also suggest that loyalty is built through interactive processes, including personalized communication and community-building efforts, rather than through perceived value alone.

Hotels should shift from simply providing value to creating valuable experiences by engaging customers in sustainable practices, ensuring sustainability is integral to all customer interactions. This focus on experience in service fosters customer loyalty. Additionally, emotional factors significantly influence consumer behavior in the luxury hospitality sector, with customers favoring businesses that align with their values, especially regarding environmental sustainability. Consequently, hotels should utilize value-based storytelling in their communication strategies to highlight their environmental and social impact, thereby boosting credibility and loyalty.

The findings are crucial for Saudi Arabia's Vision 2030, as they align with the goal of building a robust tourism sector. Implementing sustainable hotel strategies not only ensures regulatory compliance but also attracts environmentally conscious consumers, enhancing competitiveness. The research

highlights the importance of sustainable practices in boosting customer engagement, fostering loyalty, and creating an interactive environment. This combination of sustainability and engagement can lead to innovative hospitality products that maximize client satisfaction and loyalty.

6. RESEARCH LIMITATIONS AND FUTURE DIRECTIONS

The research had limitations, including a sample of 305 participants from eco-hotels in Saudi Arabia, which may not be generalizable to other contexts. It aimed to explore consumer engagement as a mediator between sustainable practices and customer loyalty. Future studies should validate findings in diverse hotel settings and investigate additional mediators like consumer perceptions of value and attitudes toward sustainable products. Demographic factors such as age, gender, and education were not considered but could influence the relationships studied. Additionally, the research treated sustainable marketing as one-dimensional; future work should examine multiple factors to better understand the interplay of consumer behavior, environmental impact, and corporate social responsibility in sustainable marketing.

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