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Green Interior Design Practices in Saudi Hospitality: A Focus on Local Sustainable Resources

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ABSTRACT

This study discusses the use of locally sourced sustainable materials in interior design by Saudi Arabian hotels. The emphasis of sustainability is emphasized in the research. Hotel industry is becoming aware of the necessity of environmentally responsible business conduct due to the increased global environmental concerns. This paper will consider the application of environmentally friendly materials in interior design in Saudi Arabia. The use of local resources enables hotels to boost local economies, preserve culture, and minimize environmental footprint. The paper deals with Local Sustainable Materials using Qualitative and Quantitative Methods (LSM-QQM) in the interior design in Saudi Arabian Hotels. Such requests may be made by the architects, interior designers, sustainability experts, guests of the hotel, and even the management. The qualitative aspect of the assessment evaluates sustainable material choice and use, and the quantitative aspect evaluates customer satisfaction of the visitors and the views of the management on the interior design being eco-friendly. Customers are better pleased with hotels that utilize local environmentally friendly products especially those customers that desire culturally authentic and environmentally friendly hotels. LSM-QQM demonstrated that hotels which use such materials can lower the operating costs which can not only enhance the local economies but also culture and mitigate the environment. The study also discovered that the use of local materials can reduce the environmental footprint of the hotel and enhance the cultural authenticity of the hotel, which has an influence on culture and the environment. LSM-QQM offers a comprehensive eco-friendly product integration strategy to hotel designers and management. The hospitality industry in Saudi Arabia is expected to enhance these ideals to offer its tourists a more sustainable and diverse experience that is cultural. LSM-QQM promotes the idea that environmentally friendly interior design is one of the ways to assist the environment and hospitality. The analyses indicated that the company was very satisfied: customer satisfaction of 98.17, sustainable material choice and use of 96.41, cultural integrity of 98.51, reducing environmental impact of 97.22 and hotel management of 96.3.

Key words: Sustainability, Environmentally Friendly Materials Local Materials, Interior Design, Hospitality.

1.INTRODUCTION

With global sustainability becoming a more vital necessity, different sectors, including the hotel industry reconsider their policies [1]. Saudi Arabia could be at the forefront of sustainable tourism by adopting locally produced environmentally friendly products such as cob- recycled wood in the hotels interiors [2]. This is possible due to the rapidly expanding Saudi tourism sector [3]. Sustainable interior design encompasses site selection, construction, operation, maintenance, restoration, and deconstruction [4]. Responsible and resource efficient interiors provide productive and friendly to the environment spaces [5]. Moreover, hotels that interior design with local materials have several benefits [6]. These are environmental safety, transport expenses saved, development of local economies and culture conservation [7]. To be more environmental friendly oriented, Saudi Arabian hotels can also choose date palm wood, hand-made tiles or natural stones to be used and look more authentic [8]. There is also plenty of natural wealth available in the country and unique cultural practices [9].

This paper is thus aimed at arguing how the Saudi Arabian hotels are incorporating into their interior designs sustainably sourced materials in case sustainability is being implemented [10]. It, therefore, implies that global environment challenges need to be addressed by using sustainability [11]. The ecological footprint of the hotel can be decreased by including locally produced supplies into the range of activities in the hotel. It also targets material consumed in its production, customer satisfaction level and

LSM-QQM management beliefs about it [13]. Green designs that are based on local resources do not only improve the customer satisfaction but also save on operational costs in cob that is recycled wood as discovered during the research[14]. An integrated approach to eco-friendly and culturally diverse experiences can now be applied to hotel management and design in Saudi Arabia [15]. This was inspired by the results of the analysis.

LSM-QQMaims to design hotel interiors in a tasteful manner using the different environmentally-friendly materials available in Saudi Arabia. This was a mixed-methods study that used both quantitative and qualitative data provided by hotel guests and management respectively and the opinions of experts in the field. The paper has looked at all the positive and negative aspects of using locally sourced cob products. LSM-QQM help designers and managers find solutions to decreasing the environmental impact of their firms and increasing visitor satisfaction, efficiency and quality. Saudi hoteliers could be the pioneers of ecotourism by marketing local and sustainable products. By being willing to preserve the environment and culture, which are some of the most important sustainability challenges in the world, Saudi Arabia would demonstrate its interest in protecting these vital areas.

Contribution of this paper

Cultural and Economic Impact: The analysis demonstrates that hotels in Saudi Arabia can get an advantage of utilizing sustainable materials that are produced locally, which can contribute to the economy and ensure cultural heritage preservation. The advantages of both financial support and preservation of culture are through use of cob materials that are recycled wood.

➤ Environmental Benefits: It is analyzed that hotels can significantly reduce their effects on environmental by applying eco-friendly interior design techniques, contributing to global sustainability efforts. This can be done through the use of LSM-QQM which is the local sustainable materials using quantitative and qualitative techniques.

➤ Sustainable Practices in the Hospitality Industry: Boosts Customer Satisfaction and Operational Efficiency: It was found that hotels can save costs on operation and offer more culturally authentic experiences to their customers by using locally sourced materials. This is a good argument on sustainability in the hospitality industry.

Section 1 of this paper reviews how locally sourced and eco friendly interiors of Saudi Arabian hotels can contribute to customer satisfaction, cultural preservation and environmental sustainability. The section 2 makes use of the related works. Section 3 refers to how the proposed method of this paper works. Section 4, to examine sustainable material options and their advantages. The results indicate that incorporation of local sustainable materials can help to improve the guest experience, facilitate the development of local economies, and advance the environmental responsibility in the hospitality sector as explained in the section 5.

2. RELATED WORKS

The paper evaluates new methods of the hotel industry in an attempt to enhance consumer satisfaction and loyalty by adopting ecologically friendly policies and procedures. The methodologies of the research studies include SEM, Segmentation-TOPSIS, and qualitative analysis in order to identify the effect of NBS, interior sustainability, and environmentally-friendly designs on operational performance and customer experiences.

2.1 Structural Equation Modeling (SEM)

One of the new strategies being adopted by the hotel business to ensure that it has a competitive edge and attracts more environmentally conscious clients is the development and implementation of environmental marketing strategies. Actually, green-minded consumers are more likely to become loyal and satisfied customers of green hotels operating with green practices and having art that does not harm the environment [16]. On the other hand, limited number of experiments have examined the mediation of relationship between the levels of green perception and customer satisfaction with their hotel through green artwork. Therefore, this paper collected thousand and plus responses of consumers and applied Structural Equation Modeling (SEM) to identify the indirect impact that clarifies the role of green arts in enhancing the enjoyment of guests in green hotels. The analysis of the survey revealed the connection between the environmental perceptions of the guests and their satisfaction with the hotel, and eco-friendly artwork in the interior design of the hotel served as the mediator.

2.2 Segmentation-TOPSIS Traveller Analysis

This paper aims to assess decision making mechanisms of customers when they select eco-friendly hotels based on online travel ratings published in the past on TripAdvisor. In order to group the guests according to their reviews and to rank the value of the eco-friendly hotel characteristics by their relative values in each category, a system was designed that combines segmentation with TOPSIS [17]. The information was all based on eco-friendly hotel reviews left on TripAdvisor in the country by real customers. In most market segments, sleep quality was rated as one of the most critical when selecting an eco-hotel. In analyzing the reviews and ratings that guests have left in the hotels with a green profile, the analysis methodology may be helpful in enabling guests to make decisions. This may be how future decision behavior can be detected. Studies on the development of eco-friendly activities could offer some new information that could be utilized by the hotel management and anyone who could make decisions relating to green policies.

2.3 Qualitative Sustainability Integration Analysis

The study received the responses of interior designers in the United Arab Emirates on the ways to incorporate sustainability into high-end five-star boutique hotels [18]. The following objectives were established to assist in

meeting this main aim: to evaluate the extent of sustainability in interior design of five-star hotel in the UAE; to evaluate how the LEED standards are incorporated into interior design of the UAE hotels; to evaluate the challenges of introducing sustainability into interior design of hotels in the UAE; and to evaluate sustainable material selections of interior designers to UAE hotel interiors. The qualitative method used to achieve this goal was to interview six highly-qualified interior designers using semi-structured interview format. Despite the push to incorporate sustainable practices in hotels in the UAE, a template theme analysis approach revealed that there is a disconnect between sustainability and luxury. The LEED program standards are not applied unless it is specified by the project itself how to use it. The greatest concerns expressed towards the incorporation of sustainability were with respect to finances and opposition by existing clients. Besides providing insight into the materials commonly employed in interior design, the test sensitised the participants regarding the sustainability ratings of the materials.

2.4 Sustainable Interior Design Performance Framework

Ensuring that the aesthetics, interiors, room decorations and furnishings of the hotel do not below what consumers and users expect is also of paramount importance to the success of the operational and facilities management strategy [19]. Nonetheless, the operational performance of the hotel has yet to be improved as far as sustainable interiors products and operational management of tangible interiors are concerned. Its aim is to fulfill a full-scale loop between Sustainable Interior Design (SID) and facilities management by determining the criteria of SID against the hotel operational performance and hedonic consumption by the user. These specialists were involved in a number of eco-friendly hotel initiatives. The considerations include the following; ecological friendliness, water and energy saving, social and health adaptability, ergonomics, environmental friendliness and eco-awareness. It will be significant to the hotel industry in general and will illuminate on the factors that played a pivotal role in the positive contribution of the sustainable interiors to the operational performance of the hotels.

2.5 Nature-Based Solutions

Considering the impacts of Nature-Based Solutions (NBS), the perspective of mental health, contentment, and barriers to switching, the paper would develop a theoretical framework that would explain why eco-friendly hotel guests would want to revisit the hotel [20]. An additional hierarchy of NBS was added to the proposed conceptual framework. This structure had switching barriers and four first-order components as modulators. All these components and processes were incorporated in the theoretical model, which sufficiently explained the variability of intention. In particular, our empirical findings of the structural analysis proved that the second-order structure of NBS that enhanced the perceptions of the guests of their own mental health to a considerable degree were enough. Additionally, the metric invariance test indicated that switching obstacles significantly reduced correlation between satisfaction and purpose. A sense of psychological stability and contentment was demonstrated to mediate the connection. Academics and practitioners can use the findings of the analysis when coming up with a plan to effectively integrate NBS within hotel management.

The analysis revealed that sustainable practices and environmentally friendly designs can make visitors enjoy and be loyal in large numbers. The analysis also emphasizes the need of earth-friendly works of art and hotel amenities with SEM and Segmentation-TOPSIS. Qualitative analyses will show both advantages and disadvantages of integrating sustainable features into the interiors of hotels, whereas NBS models increase the mood of guests and make them spend more time.

3. RESEARCH METHODOLOGY

This in-depth study which uses the mixed- methods approach examines the interior design of Saudi Arabian hotels that use environmentally friendly and locally available materials such as cob-recycled wood. This methodology provides an in-depth perspective of the topic by incorporating qualitative and quantitative forms of research. The qualitative component will involve interviewing key stakeholders on a one-on-one basis. Stakeholders include hotel managers, sustainability experts, interior designers, and architects. The semi-structured interviews will be conducted to get a better insight into the choice, use, and perception of the benefits of sustainable materials in this paper. They can be subjected to thematic analysis of the interview data and it will enable the researcher to focus on the most successful practices of integrating sustainable materials and the most crucial issues. The paper will also be travelling to these hotels, meeting people who are in the design teams and will also go through the design documentation of these hotels to see how they have incorporated environmentally friendly materials.

The figure 1 shows the Saudi Arabian friendly interior design towards hotels. It begins with the client who provides the information on frame capture, style preference and room size. The recommender service utilizes this data to recommend certain furniture such as kind, color and style out of cob. In furniture arrangement module, a recommender service adheres to the set placement guidelines and applies hierarchical tree procedural guidelines. At the same time, the room data is subjected to a style detector and palette extraction [21]. This results in a room analysis that guides the recommender service in order to generate customized recommendations depending on customer preferences and space limitations. This technology generates unique hotel interiors in Saudi Arabia that are environmental friendly by integrating client preferences, standard operating procedures and real time measurements of rooms. This is the reason why this coordinated-design approach can be achieved by

exchanging data flows with respect to achieving aesthetic goals and green techniques.

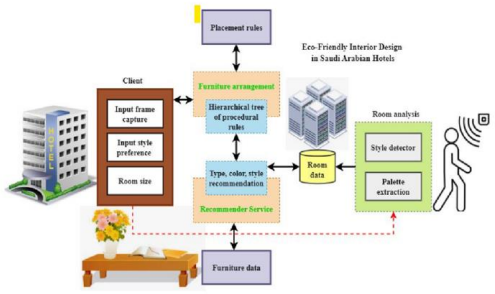


Figure 1: Eco-friendly Interior Design

This qualitative and quantitative approach will combine both to gain more insight into the advantages, disadvantages, and real-world experiences of using sustainable and locally sourced materials in hotel interior design. Saudi Arabian hotel managers and designers will find the research results useful in their quest to embrace environmentally friendly practices.

$$\int_{-\infty}^{\infty} zn^{-uz^2}dw = \left[\int_{-\infty}^{\infty} lk^{-sv^2}sz \int_{-\infty}^{\infty} ql^{-fs^2}ie\right]^{1/2} = \left[\int_0^{2\theta} \int_0^{\infty} f^{-s^2}te \times \epsilon\mu \times e\sigma\right]^{1/2} \quad (1)$$

Equation 1 proposes a complicated integral method for assessing factors that impact the use of environmentally friendly materials ql^{-fs^2} in hotel architecture lk^{-sv^2}. The theoretical framework is in line with the LSM-QQM technique dw and may represent zn^{-uz^2} the multi-dimensional elements, such as ethnic authenticity, cost savings, and environmental effects. In the same way that using locally sourced sz, sustainable materials in hotel interior design $te \times \epsilon\mu \times e\sigma$ may have positive effects on both the environment as well as local culture.

$$\frac{1}{2\mu}\int_0^{2\theta} \frac{\rho\pi}{\varphi+\beta\tan\theta} = \frac{1}{\sqrt{eg^2-kl^2}} \times \lim_{eq\times}\left(1+\frac{1}{zw}\right)^{kl} \quad (2)$$

Equation (2) represents some kind of physical system or event $\frac{1}{2\mu}$. it may be easier to quantify environmental consequences or material attributes $\rho\pi$ that are pertinent to design decisions in the framework of eco-friendly interior design utilizing (LSM-QQM). To evaluate sustainably $\beta\tan\theta$ in hotel designs in a way that maximizes $eg^2 - kl^2$ both environmental advantages and cultural authenticity, it is helpful zw to combine quantitative methodologies $\lim_{eq\times}\left(1+\frac{1}{zw}\right)^{kl}$ with qualitative evaluations.

$$\sigma\tau(\gamma\varepsilon(q)\forall\mu\pi(\delta\omega \to \alpha\varepsilon(e,t))) \quad (3)$$

This equation 3 represents an all-encompassing strategy $\sigma\tau$ that combines qualitative $\gamma\varepsilon$ and quantitative $\forall\mu\pi$ approaches to guarantee eco-friendly material use $\delta\omega \to \alpha\varepsilon$ in hotel designs (e,t). This research seeks to emphasize the significance of social and ecological responsibility in Saudi Arabian leisure by using this equation to optimize the selection of eco-friendly materials (q) and its effect on visitor satisfaction $\alpha\varepsilon$.

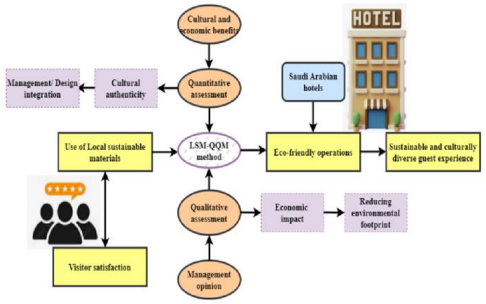


Figure 2: LSM-QQM

The LSM-QQM technique is used to develop sustainable and culturally diverse visitor experiences in Saudi Arabian hotels, as reflected in the figure 2. The initial step in the process is to integrate management and design to ensure cultural authenticity [22]. The second step is to utilize the sustainable resources of the region, which, in turn, makes customers happier and promotes environmental-friendly behavior. The approach includes both quantitative and qualitative assessments; the former considers the management perspectives whereas the latter quantitatively measures financial and cultural benefits. Eco-friendly operations generate substantial advantages such as as economic impact, reduction of environmental footprint and increased tourist enjoyment, leading to a sustainable and culturally diversified guest experience. The LSM-QQM method aims to strike a balance that would be beneficial to the hotel industry and the environment through the incorporation of cultural authenticity such as cob with sustainable measures.

$$|b| + \frac{f\sigma}{q+\mathrm{itan}\ \theta} \div (\varepsilon + YD) = \begin{cases} -r, k < 0 \\ z, h \geq 0 \end{cases} \quad (4)$$

Equation 4 with the text strikes a compromise between quantitative aspects, such as material expenses, as shown by $|b|$, and qualitative aspects, like cultural authenticity, which is expressed by z for positive cultural benefits. the importance of a balanced approach to economic feasibility $q + i\tan\theta$ and environmental sustainability $(\varepsilon + YD)$, local sustainable resources $f\sigma$ to improve hotel design in terms of cultural preservation $-r$ and environmental responsibility k.

$$\mathrm{equ}\ \gamma\delta + \mathrm{rgl}\ \gamma\Delta = 4\cos\tfrac{1}{6}(\Delta+\beta) \times \mathrm{euh}\ \tfrac{1}{4}(g \mp \pi\rho - \Delta\tau) \quad (5)$$

The efficiency of operational processes and the minimization of environmental impacts in hotel design are connected by equation 5. It is achieved using local resources equ $\gamma\delta$ optimally $\mathrm{rgl}\,\gamma\Delta$ and strategically euh improves durability $\cos\frac{1}{6}(\Delta+\beta)\times$ and social benefits

$(\Delta + \beta)$. Through the utilization of locally sourced, environmentally conscious elements $(g \mp \pi\rho - \Delta\tau)$ in Saudi Arabian hotels.

$$h(fq) = Wec_4 + \sum_{z=1}^{\infty q} \left(fc_n \cos \frac{FUG}{GH} + fd_e \cos \frac{FUG}{GH} \right) \quad (6)$$

Equation 6 takes into account qualitative and quantitative metrics to evaluate the sustainable fc_n use of materials (LSM-QQM), taking into account things cultural authenticity and environmental impact. Locally obtained environmentally friendly substances enhance local $\cos\frac{FUG}{GH}$ and sustainability $\cos\frac{FUG}{GH}$ in hotel design. This is demonstrated by the importance fd_e, which quantifies the influence of these factors on the satisfaction of guests $h(fq)$ and supervisory decisions Wec $_4$.

Interior design elements Walls

Hotel wall coverings made from ecologically friendly materials may reduce their influence on the local environment. Using feature walls made from natural stone like sandstone or limestone may emphasize the area's history and culture [23]. Another choice is traditional clay plaster, which comes in several earth tones and offers self-sufficient, aesthetically beautiful, eco-friendly air circulation with a rustic lustre. Bamboo panels may be used to build beautiful, renewable wall panels. Bamboo panels give a modern, eco-friendly alternative to classic design.

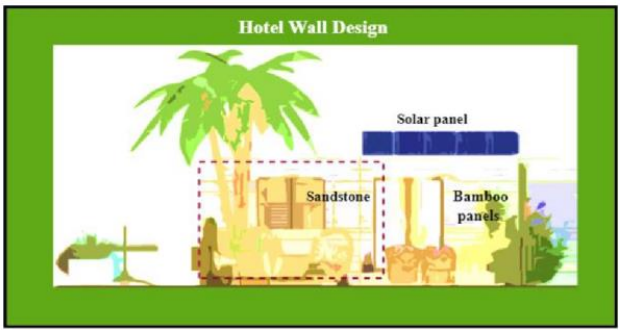


Figure 3: Design of hotel wall

The hotel wall design showcases the use of sustainable materials and renewable energy solutions is expressed in figure 3. The wall incorporates sandstone and bamboo panels, emphasizing the use of local, eco-friendly resources. Sandstone, a natural and durable material, offers thermal benefits and cultural authenticity. Bamboo panels, known for their sustainability and rapid growth, provide additional insulation and aesthetic appeal. The design includes solar panels on the roof, highlighting the hotel's commitment to renewable energy and reducing its carbon footprint. This approach not only enhances the environmental responsibility of the hotel supports local economies and preserves cultural heritage.

Floors

Eco-friendly flooring products enhance the looks of the hotel and propagate environmental consciousness. Terrazzo flooring, made of local marble, granite and glass shards, is low maintenance, strong and can be used to improve interiors of hotels. Wood floors that are recycled wood flooring or old buildings or sustainably managed wood can provide the space with a sense of character and comfort. Our world would not be habitable without this flooring. Another environmentally friendly type is the cork flooring which is comfortable to walk on, soundproof and can be painted with many finishes to fit any kind of home.

$$(s_1 t + x_1)(q_2 h + i_2) = g_1 h c_2 a^2 + (f h_1 s d_2 + f c_2 g t_1) q s + k_1 h^2 \quad (7)$$

The variables that interact in sustainable hotel design are described by equation 7 economic and social advantages are boosted $g_1 h c_2 a^2$ as a consequence of combining $q_2 h + i_2$ green procedures $(s_1 t + x_1)$ with local material use. Consequently, productivity $(f h_1 s d_2 + f c_2 g t_1)$ along with environmental sustainability $k_1 h^2$ are both enhanced.

$$(se + ih)^{qr} = \sum_{t=0}^{uz} \binom{qx}{me} hs^{1-l} qb^{os-al} + (rq + xe)^{o-1} \quad (8)$$

Here equation 8 seems intricate and unrelated to the usual discussion of environmentally conscious interior design in $(se + ih)^{qr}$ that make use of sustainable uz local resources. It seems to include processes and factors that are defined by cultural authenticity hs^{1-t} or sustainable qb^{os-al} design. Research on LSM-QQM aims to promote ecologically responsible practices $(rq + xe)^{o-1}$ in the hotel industry by evaluating sustainable material selection $\binom{qx}{me}$.

$$\tau\rho \cdot \delta\vartheta\mu = \left[\sin \pi\sigma \frac{\alpha\rho}{xr} \left(gh^2 \frac{\gamma\delta q}{ftr} \right) + \frac{\beta q}{xs} \left(\cot\theta \frac{\vartheta\rho}{\tau\theta} \right) + \frac{1}{\sin\theta} \frac{N^2\omega}{\gamma F\alpha^2} \right] \quad (9)$$

Equation 9 is about the suggested LSM-QQM approach to Sustainability $\delta\vartheta\mu$ in materials, ethnic authenticity, and environmental effect are likely all quantified by this intricate $\sin \pi\sigma \frac{\alpha\rho}{xr}$. To maximize environmentally friendly design $gh^2 \frac{\gamma\delta q}{ftr}$ results in the hotel industry $\frac{1}{\sin\theta}$, emphasizes the integration of several aspects, such as local resource use $\frac{\alpha\rho}{xr}$, cultural significance $\left(\cot\theta \frac{\vartheta\rho}{\tau\theta} \right)$, and sustainability $\frac{N^2\omega}{\gamma F\alpha^2}$, into a single metric $\tau\rho \cdot \delta\vartheta\mu$.

Figure 4: Floor Plan Design

Figure 4 explains the floor plan depicts a residential layout with distinct areas for living, dining, and outdoor activities [24]. The plan includes a spacious living and dining area, a kitchen, and a bathroom. The sleeping quarters consist of a master bedroom with an en-suite bathroom and a second bedroom. Additionally, the floor plan features a terrace leading to a large garden area, enhancing the outdoor living space. The layout is designed to maximize comfort and functionality, with clear demarcation of private and communal areas. The use of green spaces in the garden indicates a focus on creating a pleasant and natural environment.

هذا المسقط الافقي للوحدات المستقلة "فلل" في الفنادق و بيوت الضيافة و لكن نحتاج الى مسقط افقي للغرف المتكررة في مبنى الفندق.

Furniture and Paints

The use of colors and furnishings is critical in the design of environmentally friendly hotel rooms. Rattan furniture made by hand is lightweight and strong and provides a more natural and airy feel. Recycled metal furniture is stylish and environmentally friendly, and has an industrial style. Local craftsmanship Palmwood furnishings can be used to produce culturally necessary and unique products. Wall finishes should be low-VOC paints that are selected by workers and visitors. They lower the indoor air pollution, which enhances the air quality. Earthly, natural pigment paints of non-toxic, matte colour are in most colours. Earth pigment and mineral pigments are used in natural pigment paints. Think of the milk paint which is composed of milk casein, lime and natural colors. Long-lasting, biodegradable and sustainable paint is milk paint.

$$\tan \varepsilon\rho + q\cot Qx = (\sec xq + bzcosfq)^{ao} = fg^{tsc\theta} \quad (10)$$

for environmentally $\mathrm{tsc}\,\theta$ conscious interior design in Saudi Arabian hotels is related to the equation 10 sustainable materials $qcotQx$ and $(\sec xq + bzcosfq)^{a_0}$. and their influence on guest satisfaction and management $\mathrm{fg}^{tsc\theta}$ views quantitatively assessed.

$$\text{as } = rxw + \mathrm{fg_p}\,u + \mathrm{xs_{g0}}(RG) = H\left(1 + \frac{sf}{qa}\right)^{rxw} \quad (11)$$

Equation 11 may serve as a model to evaluate factors such as $\mathrm{fg_p}\,u, \mathrm{xs_{g0}}$, and (RG) affect the overall sustainability of a hotel. It measures as the impact of using locally sourced sustainable materials rxw on cultural and environmental sustainability $\frac{sf}{qa}$ indicators in hotel decor. Environmental and cultural advantages may be achieved in hospitality environments H with analysis of customer satisfaction.

$$\iiint_w (\mathrm{R}\mu \cdot \mathrm{FR})QZ = \oiint {}_{\tau}\mathrm{VR} \cdot f\mathrm{U} + (rt - fg)(ra + gh) = te^2 - Fm^2 \quad (12)$$

Equation 11 is a theoretical framework that relates the use of assets $\mathrm{R}\mu$ and functional needs $f\mathrm{U}$ in hotel design to the pleasure of visitors VR and the effect on the environment Fm^2. It was revealed that when local sustainable resources are used optimally $(rt - fg)$, operating expenses, cultural effects, and ecological impacts are all reduced. This leads to improved sustainability $(ra + gh)$ and authentic culture for analysis of sustainable material choice and use.

Figure 5: Furniture and paints

Figure 5 shows the interior design emphasizes sustainability and eco-friendliness by using different materials and furniture/paints. The low-VOC (Volatile Organic Compounds) paints and milk paint used to paint the walls are environmentally friendly and have fewer harmful chemicals [25]. The room is furnished with palmwood and hand-made rattan furniture, which demonstrates the use of natural materials that are sustainable. Palmwood furniture is long-lasting and sustainable, and the handcrafted rattan furniture provides a flair of artisanship and cultural genuineness. This architecture is designed to evoke a cozy and welcoming atmosphere and is environmentally responsible and helps local craftsmen.

$$h(at) = \frac{1}{2xrf}\oint \frac{xq(a)}{ax - c} gfq + (1 + x)^{ro} = 1 + \frac{lfg}{1\,\partial} + \frac{ox(r - ef)ta^2}{2\,\partial} \quad (13)$$

The equation 13 shows that increasing sustainability $(1 + x)^{ro}$ and integrating culture $\frac{lfg}{1\,\partial}$ is possible through maximizing material utilization $\frac{xq(a)}{ax - c}$ about expense $ax - c$ and efficiency of resources gfq. In line with LSM-QQM, it promotes environmentally friendly behaviors in Saudi Arabian hotels by stressing $\frac{1}{2xrf}$ that making optimal use of local resources $x(r - ef)$ increases environmental and cultural advantages (ta^2) by the analysis of cultural integrity.

$$RB(q) = \frac{1}{\sqrt{\partial\rho}}\int_{-\infty}^{\infty} \frac{xg^{-ax^2}fg}{qx - st} = k\int_0^{\infty} rg^{-fs - qx^2/4}xt \quad (14)$$

The efficacy of local sustainable materials xg in decreasing operational effects $qx - st$ and their incorporation into hotel sustainability. The $RB(q)$ are connected by the equation 14 sentence implies that

operational efficiency xt and overall sustainability k are improved by maximizing the use of resources xg and reducing negative consequences $rg^{-fe-qx^2/4}xt$. This is in line with LSMQQM and shows using local materials $\frac{1}{\sqrt{\partial \rho}}$ into Saudi Arabian hotel layouts could enhance reducing environmental impact.

$$\left[\int_{-\vartheta}^{8\vartheta}\int_{-\rho}^{6\sigma} eg^{-r^2}\, ks\, \mathrm{olg}\, \rho\right] = \left[\alpha \int_{p}^{-v} kq^{-sg} gh\right]^{1/2} \sqrt{\pi\sigma} \quad (15)$$

The complete incorporation of eco-friendly materials eg and their impact on operational efficiency ks olgp in hotel design is shown by equation 15. Overall viability a and effectiveness kq-59 are greatly improved when sustainable practices eg-2ks olgp are integrated σ with cultural elements ks. sustainable design concepts in Saudi Arabian hotels promote cultural integration and environmental sustainability√σ the intelligent use of local materials gh and analysis of hotel management.

The paper will take into account a number of factors such as the materials used, the design methodologies used, and the overall effect it has on sustainability and customer satisfaction. The quantitative part will involve the use of surveys among hotel guests and employees to determine their views and attitude towards the use of environmentally friendly building materials by designing questionnaires. The survey will consist of open-ended, multiple choice and Likert scale questions to make sure that the survey is representative of the population. This will be achieved through stratified random sampling. The survey data will be analyzed using descriptive and inferential statistics, correlation analysis, regression analysis and other statistical techniques which will be utilized with the help of the statistical software SPSS or R.

4. RESULTS AND DISCUSSION

4.1 Overall Findings

According to the results of the research, there is a positive relationship between the utilisation of locally sustainable materials such as cob which is a recycled wood and the level of satisfaction among the guests staying at Saudi Arabian hotels. Sustainable and culturally authentic design should be designed to offer the best experience to the visitors. This assists Hotels that employs qualitative selection of sustainable material to interior design opinions that are eco-friendly. Interpretations of interviews in the form of thematic analysis identified the best practices and techniques of successful design, and case studies reduced the environmental impacts of the project. Sustainable local materials can increase hotel profits and the environment as per research. This aids visitors and the environment.

4.2 Dataset Description

To curb market growth, the high cost and competition with other accommodation alternatives are likely to exist [26]. Luxury hotel design can be quite expensive, as the employment of expensive materials, bespoke pieces, and design elements can hike the cost of hotel construction and renovation considerably. This can be an entry barrier to those who are new in the industry and it can limit the growth prospects of those who are already in the industry. The second aspect that has also led to the emergence of the competition of luxury hotels is the spread of other forms of accommodation like vacation rentals and Internet. In combating this, the hotels are now obliged to differentiate themselves with their competitors through innovative design, tailor-made service, and unique experiences to its guests.

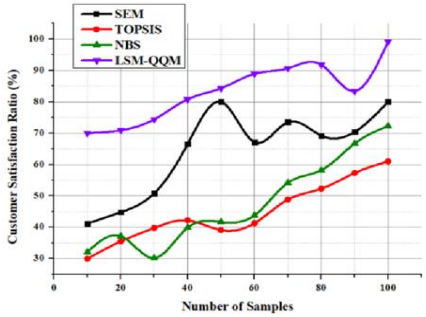
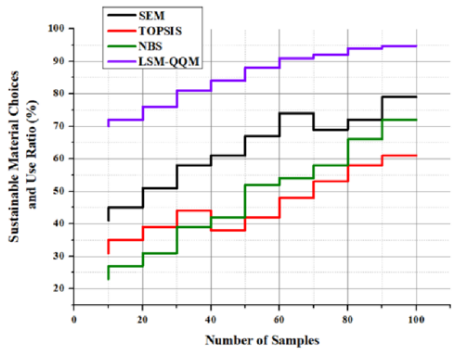


Figure 6: Analysis of customer satisfaction

4.3 Customer Satisfaction Analysis

An analysis on customer satisfaction reveals that guests at Saudi Arabian hotels indeed appreciate customer satisfaction when hotels incorporate locally sourced and environmentally friendly materials in their room design as is reflected in figure 6 and equation 11. Cultural authenticity and environmental responsibility increase with the use of these materials, thus making the visitors happier. Many polls and comments show preference towards hotels that vie on cultural heritage and environmentally friendly operations. It is this choice that makes guests more loyal and leaves us great reviews. Positive customer feedbacks and repeat visits fostered by the overall enhancement of the guest experience through the emphasis on the ecologically-friendly and culturally diversified furnishings promote the hotel reputation and its occupancy rates. In this suggested approach the cob-recycled wood materials is applied in the Saudi arabian hotels made customer satisfaction is analysed and get the value by 98.17% which is higher than the current method.



4.4

Figure 7: Analysis of Sustainable Material Analysis

4.4 Sustainable Material Analysis

Based on analyses of sustainable material choice and utilizationis presented in figure 7 and equation 12, hotel interior in Saudi Arabia can be improved using sustainably sourced, locally manufactured materials. Besides helping the local economy through the application of locally-sourced resources, the materials help minimize the carbon effect, which is in line with environmental objectives. Based on surveys, design professionals select materials that are eco-friendly, sustainably sourced and historic. Empirical evidence exists that demonstrates how such materials save operating costs, prolong the life of things and beautify things. Thus, such materials play a significant role in interior design of hotels which is eco friendly. In this proposed method, the ratio of the cob- recycled wood sustainable material choice and use is analysed and get the value of 96.41%.

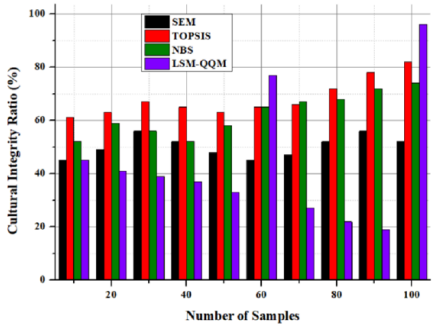


Figure 8: Analysis of cultural integrity

4.5 Cultural Integrity Analysis

This cultural integrity analysis looks at how using eco-friendly and locally produced materials in hotel decor might help preserve and promote Saudi Arabian cultural heritage figure 8 and equation 13. Visitors may engage in a more authentic and participatory cultural experience with these materials that mirror traditional craftsmanship and design aesthetics. Incorporating artifacts with deep cultural significance allows hotels to stand out as well as honoring the past and continuing the history of the places they are located. Hotels stand apart from global chains because to their cultural integration, which draws in tourists from all around the globe seeking genuine cultural experiences. In along with preserving the hotel's cultural integrity, this strategy strengthens the hotel's brand and makes it more attractive. Using this proposed method the analysis of cultural integrity value is obtained by 98.51% by using the cob-recycled wood sustainable material.

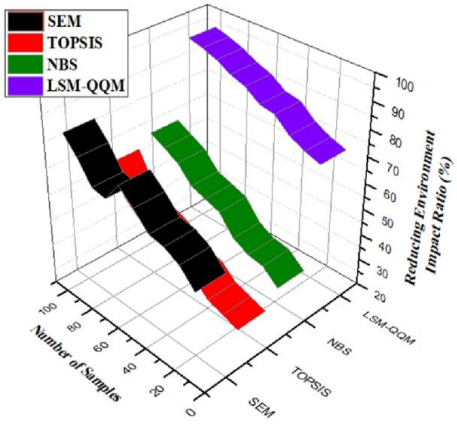


Figure 9: Analysis of reducing environmental impact

4.6 Environmental Impact Analysis

In equation 14, the environmental impact is reduced as it is indicated in figure 9 and concentrates on the use of environmentally friendly materials in hotel interiors in Saudi Arabia. The investigation focuses on the good environmental outcomes. Hotels can reduce their environmental footprint by purchasing products locally, which reduces their total environmental footprint due to the reduction in transportation-related emissions. Eco-friendly materials like bamboo, recycled wood and natural stone should also be utilized to help preserve the environment. Its results indicate that such strategies can assist the hotels to minimize waste, thereby saving energy consumption and enhancing sustainability of the community. This plan is in line with the internationally accepted environmental objectives as it emphasizes the hotel to be environmentally friendly in its operations, and to improve its environmental image. In comparison with the existing method the analysis of cob-recycled wood sustainable materials lowering the environmental impact is slowly enhanced in the suggested method in the ratio of 97.22.

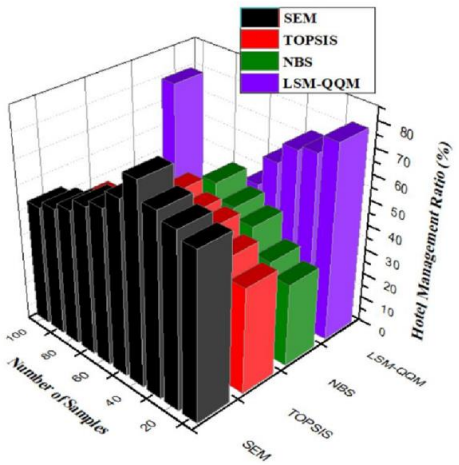


Figure 10: Analysis of hotel management

4.7 Hotel Management Analysis

The advantages and difficulties of operations of using eco-friendly materials into hotel decor are researched in a thorough analysis of hotel management presented in figure 10 and equation 15. Management has indicated that, although the initial investment would be incurred, there would be long term gains in the form of reduced energy costs, maintenance costs and visitor satisfaction. Green practices can be used to promote the image of the hotel and attract environmentally conscious clients. Training of staff members about the principles of sustainability and conducting constant assessments of the effects of the actions on the environment are the necessary elements of good management. Hotels are sure that the strategy would assist the hotels remain competitive, live up to the sustainability expectations of their customers, and create a favorable effect on conserving cultural heritage and the environment. The value of the proposed method is 96.3% after applying the cob- recycled wood sustainable materials to the hotel management is analyzed and obtained.

The analysis established that the Saudi Arabian hotels can positively influence customer satisfaction, cultural preservation and the environment when utilizing environmentally-friendly materials that are produced locally. The level of customer satisfaction was achieved at the high level of 98.17, but mainly due to the recognition of cultural authenticity and environmental responsibility by the guests. In line with the environmental objectives and in the local economy positive, ecologically appropriate material choice is with a satisfaction score of 96.41. The maintenance and propagation of the Saudi Arabian heritage is through cultural integrity and has an impressive score of 98.51. This will be attractive to tourists who want to experience the cultural life of the locals. Environmental impact is reduced by 97.22% using environmentally friendly items that are purchased locally. The 133 percent of hotels with good management guarantees the long-term sustainability and benefits, which enhance the reputation and competitiveness of the hotel.

5. CONCLUSION

The hospitality industry in Saudi Arabia can be part of the world sustainability initiatives through the use of environmentally friendly local materials in interior design of hotels. This research shows that eco-friendly wood materials made locally by recycling of cob-recycling could enhance tourist satisfaction, functionality and culture preservation. By combining these principles, Saudi hotels may create a more sustainable and culturally immersing experience to their visitors. The research will give hotel management and interior designers sustainable and ethical interior design principles.

Locally produced materials sourced sustainably will probably do a lot in improving design within Saudi Arabian hotels. By going green, hotels would be in a position to enhance customer satisfaction, protect and conserve cultural heritage and decrease their environmental footprint. These statistics imply that tourists are inclined to select culturally correct locations and environmental friendly ones to stay as well. By taking advantage of local resources (material) found at such locations, operational costs can be saved and local economy supported. Consequently, the measures enhance the reputation of a hotel among prospective customers and advance larger environmental and cultural agendas simultaneously. The hotel business now has a holistic approach to environmentally-friendly interior design with the help of cob-recycled wood sustainable material. As an illustration, customer satisfaction, sustainable material choice, cultural integrity, reducing environmental impact and lastly hotel management were found to be highly satisfied 96.41% and 98.51 and 97.22 and 96.3 respectively.

6. FURTHER RESEARCH

Further studies are required to elaborate on these results in terms of environmental and financial impacts of using locally acquired materials via sustainability in various settings across the globe. Universality of LSM-QQM model world will be determined by comparative studies conducted between hotels in Saudi Arabia and other setups of the cultures. The sustainable approaches can be refined to the constantly evolving demands of the visitors through considering preferences and satisfaction rates over time. Cultural and environmental value may be enhanced through partnering with local artisans and specialists who are knowledgeable on sustainability. To assist in development, it would be nice to have state of the art technology that could monitor the sustainability measure of these activities.

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