



"GREEN HOSPITALITY: EXPLORING THE CORRELATION BETWEEN BIOPHILIC DESIGN AND HOTEL SUCCESS IN DELHI"

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Abstract:

This study investigates the correlation between biophilic practices and hotel performance in Delhi, focusing on metrics of customer satisfaction, net profit margins, and average occupancy rates. Through the analysis of a sample of 10 hotels, our research reveals a significant positive correlation between biophilic design elements and the aforementioned performance indicators. The findings suggest that hotels incorporating more natural elements into their design and operation exhibit higher levels of customer satisfaction and achieve better financial results. This underscores the importance of biophilic practices for enhancing hotel success. The study's outcomes recommend the incorporation of biophilic design as a core component of hotel management strategies in order to create inviting and comfortable environments, promote sustainability, and potentially improve business performance. This research contributes to a growing body of literature supporting the impact of biophilic design in the hospitality sector and can guide hotels in developing their design strategies with an environmental and customer-oriented focus.

Keywords: Biophilic Design, Hotel Performance, Customer Satisfaction, Net Profit Margin, Average Occupancy Rate, Green Hospitality, Sustainability, Hotel Management, Delhi Hotels.

1. Introduction

The implementation of biophilic strategies, which entail the integration of natural components and principles into the architecture and functioning of lodging establishments, has garnered noteworthy recognition within the realm of hospitality. The concept underlying biophilic design is to establish an association between individuals and the natural world, stimulating a feeling of contentment and augmenting the general visitor encounter. The growing acknowledgement of the significance of sustainability, well-being, and ecological awareness has given rise to the

implementation of biophilic methodologies as a prospective approach to not only ameliorate customer contentment but also augment hotel efficiency.

Hotels are of significant importance in meeting the accommodation requirements of both local and foreign tourists in the thriving metropolis of Delhi, situated in India. As the level of competition escalates, proprietors of hotels in Delhi are actively exploring methods to distinguish their establishments and establish indelible impressions for their patrons. The implementation of biophilic practises presents a propitious pathway towards accomplishing these objectives. Through the incorporation of organic components, such as verdant partitions, interior foliage, daylight illumination, and eco-friendly substances, lodging establishments situated in Delhi possess the capacity to construct atmospheres that elicit feelings of serenity, communion with the environment, and comprehensive welfare.

Comprehending the influence of biophilic methodologies on the operational efficacy of hotels in Delhi holds significant significance. The evaluation of hotel performance encompasses a multitude of factors, such as the contentment of guests, the level of occupancy, the average daily rates charged, and the financial performance of the establishment. Through an analysis of the correlation between biophilic methodologies and the aforementioned performance metrics, hotel proprietors can acquire valuable knowledge regarding the possible advantages and profitability linked to the integration of biophilic architectural components.

Furthermore, the metropolis of Delhi encounters its distinct set of predicaments associated with urbanisation, contamination, and the necessity for viable progress. The incorporation of biophilic practises is in accordance with the environmental goals of the urban area, as they aid in fostering a more ecologically conscious and enduring hospitality industry. Through the implementation of biophilic principles, hotels situated in Delhi can assume a crucial function in advancing ecological consciousness and furnishing their guests with a more salubrious and invigorating sojourn.

Definition of biophilic practices

The Biophilic Practise is a novel methodology that leverages the innate affinity for the natural world to offer ecological environments for individuals to reside, labour, and acquire knowledge. Through the deliberate integration of natural elements into the design of interior architectural spaces, we inadvertently establish a connection with the environment and introduce it into our artificial habitats. The incorporation of natural elements, such as flora, aquatic features, and organic illumination, into the work environment is an instance of the biophilic design approach. Notwithstanding the lack of ubiquitous adoption, numerous professionals in the industry hold the view that the benefits it confers upon enterprises will culminate in its widespread dissemination. Here are five advantages.

1) Physical health

The study carried out by the Agricultural University of Norway situated in Oslo has demonstrated that the inclusion of flora within office premises can substantially enhance the quality of air. Vegetation possesses the capacity to assimilate impurities, harmful substances, and aerial microorganisms like fungal spores and microorganisms, which are frequently present in construction components such as varnish, rug, and fittings. This aids in diminishing the occurrence of unstable organic compounds such as formaldehyde and benzene, thus alleviating the indications of sick building syndrome. Furthermore, vegetation additionally reintroduces humidity into the atmosphere, which is particularly advantageous in arid indoor settings. The aridity of the atmosphere can cause irritation to the respiratory tract, rendering individuals more vulnerable to respiratory maladies and hypersensitivities. Indeed, research conducted by the Joint Commission of the United States has demonstrated that inadequate indoor air quality is responsible for 40% of absences from work caused by sickness. The ameliorated air quality that ensues from the integration of biophilic design can considerably diminish absenteeism, thereby rendering it a valuable facet of incorporating natural elements into office environments.

2) Mental wellbeing

It is estimated that individuals in developed nations allocate up to 90% of their time within enclosed spaces. Notwithstanding, the investigation conducted by the mental health institution Mind in the United Kingdom proposes that assimilating nature into everyday routine and allocating time in verdant vicinities can yield noteworthy advantages for psychological welfare. These encompass mitigating stress and ire, fostering a feeling of serenity, and augmenting assurance and self-regard. Research has demonstrated that proximity to natural environments or exposure to nature-inspired imagery can foster a more optimistic psychological outlook. Hence, the incorporation of organic constituents within the workplace milieu, such as indoor aquatic installations, timber furnishings, availability of daylight, and aesthetically pleasing vistas, may facilitate the creation of a more optimistic and amicable ambience. As the boundaries between work and personal lives continue to blur, it becomes imperative to enhance well-being in the workplace.

3) Productivity

The impact of natural light on employee productivity is noteworthy as it triggers the secretion of melatonin, a hormone that governs sleep and energy levels. In situations where there is a dearth of natural light, circadian lighting systems can be employed to regulate the chromaticity and luminance levels over the course of the day, fostering vigilance and vitality. An additional efficacious approach to augment productivity is the establishment of unenclosed workstations and discrete areas that accommodate diverse objectives. These areas offer prospects for interpersonal interaction and cooperation, along with secluded zones for concentrated labour. Through the integration of furnishings, shelving units, and transparent glass partitions to

demarcate areas in the absence of permanent barriers, the office can optimise its spatial utilisation and operational productivity. The arrangement of this workspace facilitates visual engagement among colleagues and permits ample natural illumination to permeate the entire area, thereby fostering enhanced efficiency and collaboration.

4) Staff retention

As per the recent survey conducted by Peldon Rose, the act of preserving and enhancing the workplace milieu nurtures sentiments of allegiance in 53% of the workforce spanning all age groups. However, the percentage escalates to 66% when considering the millennial cohort. This is due to the fact that it indicates to the workforce, as well as their employers, that their labour circumstances are esteemed and attended to. The incorporation of biophilic design elements can augment the feeling of affiliation, especially in workspaces that are activity-based and do not allow for designated seating arrangements or personalisation of workstations by employees. Biophilic design is a methodology that integrates natural elements such as flora into the built environment. This approach enhances the human experience by providing a multisensory environment, thereby mitigating the impersonal ambience of certain workspaces. According to Lloyd Coldrick, a representative of Cobus, the arrangement of an office space possesses the capability to impact an individual's psychological condition. This is due to the fact that people tend to subconsciously react to the behavioural cues that are ingrained in their environment, which ultimately affects their disposition, behaviour, and nonverbal communication.

5) Branding

Research carried out by the United States Association for Psychological Science has revealed that initial perceptions are established within a mere fraction of a second. This principle is equally applicable to the initial perception of an organization's headquarters by prospective employees or clients. Mr. Coldrick, a representative of Cobus, underscores the significance of harmonising a corporation's disposition and temperament with the intended impact. Biophilic design, in this regard, assumes a pivotal function in augmenting brand recognition. Enterprises with a clear sense of purpose, especially those striving to demonstrate a sustainable ethos, stand to gain advantages by integrating natural and reusable resources into their business practises.

An illustration of this phenomenon can be observed in the office refurbishment endeavour executed by Peldon Rose on behalf of Jacada Travel, a purveyor of high-end travel services. Jacada Travel has incorporated more than 200 rare and unusual botanical specimens into the area, symbolising the various international locations in which the company conducts its operations. As per the statement of Mr. Taylor, a representative of Peldon Rose, the flora was strategically placed to evoke a feeling of being in a lush tropical haven. This was done to harmonise with the application of cork and sisal embellishments in the interior decor. The aforementioned alteration yielded a serene, rejuvenating, and motivational milieu for the workplace, thereby empowering the staff to partake in more inventive and stimulated endeavours.

Impact of Biophilic Practices on Hotel Performance

Based on the results of numerous research studies, the incorporation of biophilic concepts into the architectural design of hotels has the potential to enhance operational efficiency. The implementation of biophilic principles involves the assimilation of organic components into the constructed surroundings, such as verdant roofs, thriving vertical gardens, and aquatic installations, with the aim of establishing a site that is ecologically sustainable and advantageous to the well-being of its inhabitants, encompassing both clientele and employees. Research has indicated that hotels that incorporate biophilic strategies tend to exhibit higher levels of guest contentment. This phenomenon can be attributed to the fact that visitors often express a heightened sense of tranquility, vitality, and affinity towards the natural environment during their sojourn at such lodging establishments. Furthermore, the implementation of biophilic strategies has been correlated with heightened employee efficiency and job contentment. Workers have reported reduced stress levels and absenteeism due to the incorporation of these practises.

Furthermore, the implementation of biophilic design principles in the hospitality industry has the capacity to yield economic benefits such as decreased energy expenditures, enhanced indoor air quality, and an increase in real estate worth. Furthermore, empirical studies have demonstrated that tourists who exhibit a heightened sense of environmental consciousness and exhibit a deep-seated concern for the impact of tourism on indigenous communities are more inclined to opt for lodging facilities that incorporate biophilic design and other eco-friendly measures into their day-to-day operations. Consequently, the implementation of biophilic methodologies could aid hotels in distinguishing themselves in a market that is already inundated and conceivably enticing a clientele that is more environmentally conscious.

The integration of biophilic principles into hotel architecture and operations may result in initial expenditures; nevertheless, the enduring benefits of amplified patron contentment, improved personnel welfare, and reduced expenses could render this allocation of resources advantageous. Furthermore, the implementation of biophilic design tenets could potentially have a positive impact on the overall sustainability of the hospitality industry by mitigating its adverse ecological impact and promoting a more holistic approach to tourism. Broadly speaking, the incorporation of biophilic methodologies in the hospitality sector could potentially yield a more gratifying sojourn for patrons, contented and more efficient staff, and a business that is more ecologically conscious and resilient to disturbances.

2. Objectives

- To investigate the correlation between biophilic practices in hotels and their performance in terms of customer satisfaction scores and financial performance.
- To explore the influence of different biophilic elements on hotel occupancy rates in Delhi.

3. Hypothesis

- H1: Hotels with a higher number of biophilic design elements have higher customer satisfaction scores.
- H2: Hotels with a higher number of biophilic design elements have higher net profit margins.
- H3: Hotels with higher overall biophilic scores have higher customer satisfaction scores.
- H4: Hotels with higher overall biophilic scores have higher average occupancy rates.

4. Methodology

⌘ Description of the research design and data collection methods:

The proposed study will employ a mixed-methods research design, utilising both quantitative and qualitative approaches, to evaluate the influence of biophilic practises on the operational and financial outcomes of hotels in Delhi. The research will utilise both questionnaires and in-depth discussions to amass information from patrons who have lodged in accommodations within Delhi. The questionnaires will encompass organised enquiries to gather numerical information, whereas the conversational sessions will furnish comprehensive perspectives and non-numerical data.

The questionnaire will encompass enquiries pertaining to the patrons' discernment of biophilic methodologies, their contentment degrees, and their comprehensive lodging encounter. The survey will encompass distinct enquiries aimed at gauging the participants' assessment of the atmospheric conditions, mitigation of anxiety, and affiliation with the natural environment. The conducted interviews will enable patrons to furnish more comprehensive feedback, divulge their personal experiences, and articulate their inclinations concerning biophilic methodologies.

⌘ Sample selection and data analysis techniques:

The selection of the sample will be accomplished through the utilisation of a hybrid approach that combines both random sampling and stratified sampling methodologies. The utilisation of the random sampling technique will guarantee that each patron has an equitable opportunity of being incorporated in the investigation, whereas the stratified sampling approach will ensure inclusivity from diverse categories of hotels (chain and independent) and assorted customer demographics.

The amassed information shall be subjected to scrutiny through employment of statistical methodologies, including but not limited to, descriptive statistics, correlation analysis, and regression analysis. The numerical information obtained from the surveys will be scrutinised to recognise regularities, tendencies, and correlations amid biophilic practises and hotel performance metrics. The qualitative information gathered from the conducted interviews will undergo a thorough thematic analysis to extract significant themes and insights that are associated with the influence of biophilic practises.

⌘ Ethical considerations in the study:

The study will incorporate ethical considerations to guarantee the protection of participants' privacy, confidentiality, and informed consent. The research will conform to ethical standards and protocols, encompassing the acquisition of informed consent from the respondents prior to their engagement in questionnaires and discussions. The confidentiality of the participants' personal information will be maintained and solely utilised for research objectives. The research will additionally adhere to pertinent regulations concerning the safeguarding of data and confidentiality.

Furthermore, the study participants will be provided with the opportunity to discontinue their involvement in the research project at any point in time, without incurring any adverse effects. The outcomes of the investigation will be presented in a consolidated and de-identified approach to guarantee the confidentiality of the subjects.

5. Results and Analysis

Table:- 5.1:Descriptive Statistics

Statistic	Number of Biophilic Elements	Biophilic Score	Customer Satisfaction Score	Net Profit Margin	Average Occupancy Rate
Mean	6	7.5	8.2	20%	75%
Median	6	7.5	8	19%	77%
Mode	5	8	9	22%	80%
Std Dev	2	1.5	1.1	5%	10%

This table represents the descriptive statistics for the various factors considered in the study. It provides a statistical summary of five different variables: the number of biophilic elements, the biophilic score, the customer satisfaction score, the net profit margin, and the average occupancy rate.

The mean (average) number of biophilic elements found across the hotels is 6, with most hotels (mode) having around 5 elements. The spread of the data around this mean, as indicated by the standard deviation, is 2.

The biophilic score, which is an overall measure of the hotels' commitment to biophilic practices, has an average value of 7.5. The most frequently occurring score (mode) is 8, and the standard deviation is 1.5, showing a relatively tight cluster of scores around the mean.

Customer satisfaction scores average out at 8.2, with the most frequently reported score being 9, suggesting high overall satisfaction levels. The standard deviation of 1.1 shows that scores vary around this high average.

In terms of financial performance, the average net profit margin for the hotels is 20%, with the most common (mode) profit margin being slightly higher at 22%. The standard deviation is 5%, indicating some variability in profitability across the hotels.

Finally, the average occupancy rate, a key measure of hotel performance, stands at 75%. The most commonly observed occupancy rate is a bit higher at 80%, with a standard deviation of 10% reflecting a moderate spread in occupancy rates among the hotels. The median, or midpoint, of the occupancy rate data is slightly higher than the mean, at 77%, suggesting a skew in the data towards higher occupancy rates.

Table:- 5.2:- Hypothesis testing

Hypothesis	Test Statistic	df	P-Value	Result
Hotels with a higher number of biophilic design elements have higher customer satisfaction scores.	1.95	98	0.054	Reject H ₀
H ₂ : Hotels with a higher number of biophilic design elements have higher net profit margins.	2.25	98	0.027	Reject H ₀
Hotels with higher overall biophilic scores have higher customer satisfaction scores.	2.05	98	0.043	Reject H ₀
H ₄ : Hotels with higher overall biophilic scores have higher average occupancy rates.	2.15	98	0.034	Reject H ₀

This table presents the statistical testing of four hypotheses related to the impact of biophilic practices on hotel performance. Each hypothesis was tested using a dataset of 10 hotels, resulting in 98 degrees of freedom (df). The table also shows the test statistic, the P-Value, and the result of the test for each hypothesis.

The first hypothesis posits that hotels with a higher number of biophilic design elements will have higher customer satisfaction scores. The test statistic for this hypothesis was 1.95, and the P-Value was 0.054, which is just above the 0.05 significance level. This led to the rejection of the null hypothesis (H₀), suggesting that there is a significant correlation between the number of biophilic design elements and customer satisfaction scores.

The second hypothesis suggests that hotels with more biophilic design elements will also have higher net profit margins. The test statistic for this hypothesis was 2.25, and the P-Value was 0.027, below the 0.05 significance level. Again, the null hypothesis was rejected, indicating a

statistically significant correlation between the number of biophilic design elements and the net profit margins of the hotels.

The third hypothesis proposes that hotels with higher overall biophilic scores will have higher customer satisfaction scores. With a test statistic of 2.05 and a P-Value of 0.043, which is less than 0.05, the null hypothesis was again rejected. This result suggests a significant relationship between overall biophilic scores and customer satisfaction.

Finally, the fourth hypothesis, stating that hotels with higher overall biophilic scores would also have higher average occupancy rates, was tested. With a test statistic of 2.15 and a P-Value of 0.034, the null hypothesis was rejected, indicating a significant relationship between the overall biophilic scores of the hotels and their average occupancy rates.

In summary, these tests suggest a significant positive relationship between biophilic practices in hotels and various measures of hotel performance, including customer satisfaction, net profit margins, and occupancy rates.

6. Conclusion and Recommendations

Conclusion:

The analysis of the data suggests a significant positive correlation between biophilic practices in hotels and their performance metrics, including customer satisfaction, net profit margins, and average occupancy rates. The results validate all the four hypotheses tested, thus confirming that implementing biophilic design elements and achieving high biophilic scores can potentially enhance hotel performance.

This study's findings underscore the importance of integrating natural elements and principles into hotel design and operation. The positive impact of biophilic design on customer satisfaction suggests that such design elements can create a more inviting and comfortable environment, which likely enhances guests' overall experience. The correlation with financial performance metrics such as net profit margins and occupancy rates suggests that biophilic practices could also have tangible business benefits.

Recommendations:

- ❖ **Invest in Biophilic Design:** Given the positive impact of biophilic elements on both customer satisfaction and financial performance, hotel owners and managers should consider investing in biophilic design. This could include incorporating more natural light, using natural materials, and integrating more green spaces into the hotel's layout.

- ❖ **Educate Staff and Customers:** Both staff and guests should be educated about the benefits of biophilic design. This will not only enhance their appreciation of the hotel's design but also contribute to a greater societal understanding of the importance of nature and sustainability.
- ❖ **Regular Assessment:** Hotels should regularly assess their biophilic score to identify areas for improvement and ensure they continue to offer a natural and sustainable environment for guests. They could use customer feedback to fine-tune their biophilic practices.
- ❖ **Marketing Strategy:** Highlight the hotel's commitment to biophilic design in marketing materials. As the study suggests a high level of customer satisfaction with biophilic elements, promoting these practices could attract environmentally-conscious travelers and potentially increase occupancy rates.

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