



Adaptive reuse of heritage buildings through sustainable interiors

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Abstract

This paper explores the adaptive reuse of heritage buildings, integrating sustainable interior design practices. Emphasizing preservation and modern functionality, it delves into strategies that harmonize historical significance with contemporary environmental consciousness. By examining innovative approaches to repurpose these structures, the study aims to demonstrate how sustainable interior design principles can be seamlessly integrated, ensuring the preservation of cultural heritage while promoting eco-friendly practices within the built environment.

Keywords: Historic preservation, repurposing buildings, modern interventions, urban demand, user experience, adaptive reuse

Introduction

The Heritage buildings hold immense historical and cultural significance, but many face challenges related to functionality and sustainability in the modern world. The adaptive reuse of heritage buildings is an increasingly crucial aspect of sustainable urban development. As cities evolve, preserving these structures not only conserves cultural heritage but also addresses the growing need for functional spaces. This project aims to address the issue by exploring adaptive reuse strategies that incorporate sustainable interior design solutions. By doing so, the project seeks to breathe new life into these architectural gems while preserving their historical value.

Aim

The primary aim of this project is to develop a comprehensive framework for the adaptive use of heritage buildings, emphasizing sustainable and creative interior design solutions that enhance functionality, aesthetic appeal, and user experience, while safeguarding the cultural and historical heritage of the space.

Objective

To conduct an in-depth analysis to understand the architectural, cultural, and historical significance of the selected heritage building.

To assess the present-day requirements for the adaptive reuse, considering potential uses such as commercial,

residential, cultural, or mixed-use spaces.

To explore sustainable materials, technologies, and practices for the interiors, aligning with contemporary environmental standards.

To prioritize user comfort, accessibility, and safety, ensuring that the design accommodates diverse needs and preferences.

Methodology

- Preliminary Research
- Literature Review
- Case Study
- Data collection through Historical Analysis and Functional Assessment
- Design Conceptualization
- Inference and Conclusion

Data Analysis: The survey aims to gather insights into public experiences and preferences regarding the adaptive reuse of heritage buildings.

What is your age range?

1. What is your gender?
2. Are you familiar with the concept of adaptive reuse of heritage buildings?
3. How important do you think it is to preserve heritage buildings through adaptive reuse?
4. Have you visited any adaptively reused heritage

- buildings in your area?
- How would you rate your overall experience in the adapted heritage building?
 - How knowledgeable do you feel about sustainable practices?
 - How important do you think it is to incorporate sustainability practices for heritage buildings?
 - Would you be more inclined to visit/use/live in a heritage building that has been repurposed with sustainable designs or a modern building?
 - Would you prefer to visit/use spaces with sustainable design, even if it means paying a slightly higher cost?
 - Which adaptive reuse functions do you find most appealing for heritage buildings?
 - Should the government involve the public in decisions regarding the adaptive reuse of heritage buildings?.

Analysis through User opinion
Demographic Information

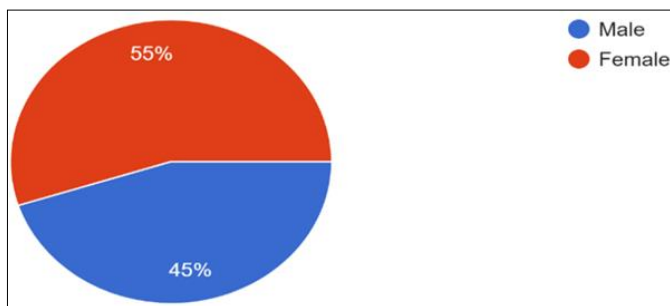


Fig 1: What is your gender?

Inference and interpretation

The survey encompassed a total of 40 respondents within the age range of 20 to 50 years old. The participants consisted of an almost equal distribution between male and female respondents, indicating a balanced representation of genders in the survey sample.

Awareness and Familiarity

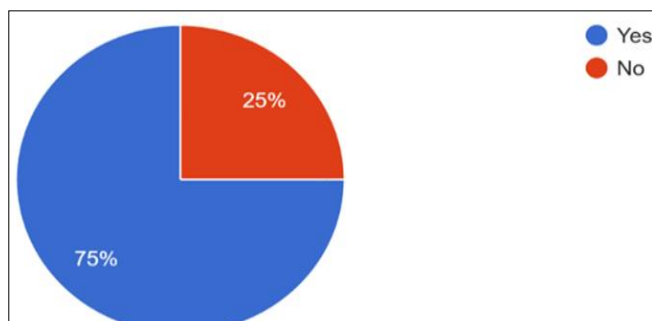


Fig 2: Are you familiar with the concept of adaptive reuse of heritage buildings?

Inference and interpretation

Many respondents across different age groups, particularly those aged 21-30, show familiarity with the concept of adaptive reuse of heritage buildings. There's a trend indicating that younger individuals (aged 21-30) seem to be more familiar with this concept compared to older age groups (31-40 and 41-50).

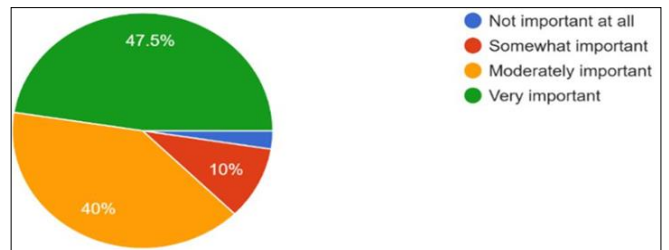


Fig 3: How important do you think it is to preserve heritage buildings through adaptive reuse?

Inference and interpretation

The most frequent response is "Very important," indicating a significant inclination towards the high importance of preserving heritage buildings. This segmentation might suggest varying attitudes towards the importance of preserving heritage buildings based on age. Most respondents appear to value the preservation of heritage buildings through adaptive reuse, considering it as either very important or moderately important. However, there is diversity in opinions, indicating that some individuals might not perceive it as crucial or have varying degrees of importance assigned to this concept.

Experience and Engagement

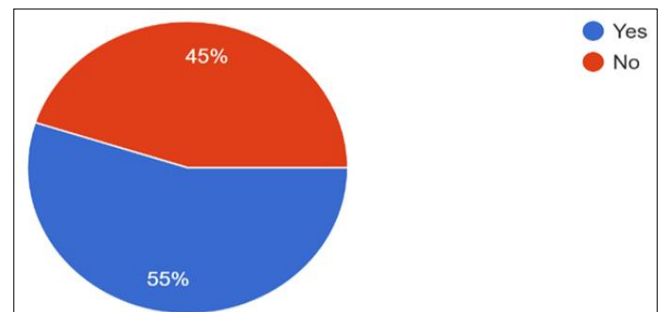


Fig 4: Have you visited any adaptively reused heritage buildings in your area?

Inference and interpretation

Out of the 40 respondents approximately half of the users have visited the reused buildings. The highest number of visitors are within the 21-30 age group. The 31-40 age group has a mix of respondents who have and haven't visited such buildings, but the number of respondents is relatively low. In the 41-50 age group, there's a small number of respondents, with one indicating a visit to adaptively reused heritage buildings.

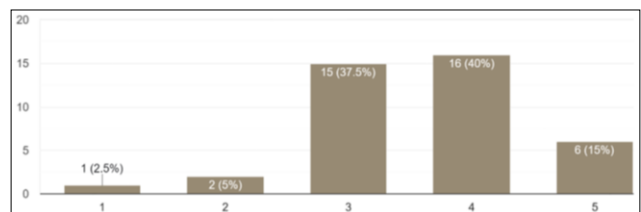


Fig 5: How would you rate overall experience in the adapted heritage building?

Inference and Interpretation

From the above observation, there's a range of opinions

regarding the overall experience, indicating a mix of satisfaction levels among respondents. Many responses fall within the 3 to 4 range, suggesting a moderate to good overall experience among most respondents. Occasional low (1) and high (5) ratings might indicate outliers or individuals with particularly strong positive or negative experiences. Respondents in the higher age brackets (31-40 and 41-50) generally tended to rate their experiences more positively, although the number of responses in these ranges is relatively lower.

Preferences and Opinions

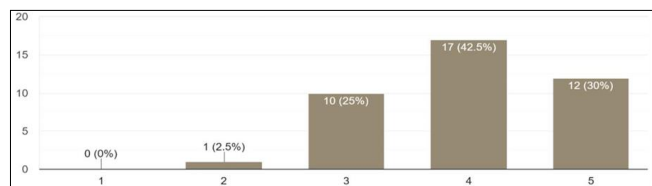


Fig 6: How important do you think it is to incorporate sustainability for heritage buildings?

Inference and interpretation

Overall, most respondents across different age groups seem to recognize the significance of incorporating sustainability practices for heritage buildings. Younger respondents, particularly in the 21-30 and 31-40 age groups, appear to hold a stronger belief in the importance of sustainability practices in preserving and maintaining heritage structures.

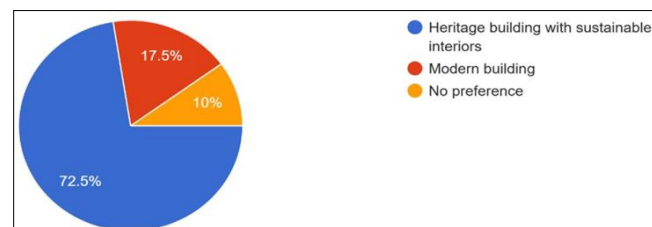


Fig 7: Would you be more inclined to visit/use/live in a heritage building that has been repurposed with sustainable designs or a modern building?

Inference and interpretation

This indicates a general preference for historical spaces integrated with sustainable designs among respondents. There's a notable portion of the respondents who are undecided or require more details about the benefits or rationale behind the higher cost for sustainable spaces. A minority of respondents are not inclined towards preferring sustainable spaces, even if it involves paying more.

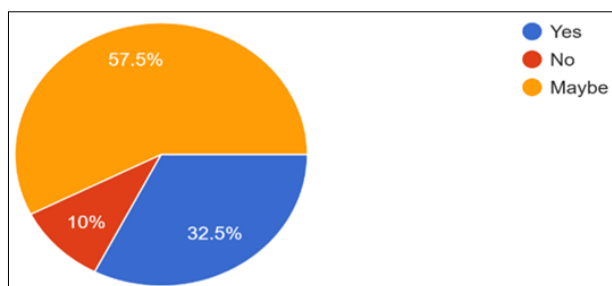


Fig 8: Would you prefer to visit/use spaces with sustainable design, even if it means paying a slightly higher cost?

Inference and interpretation

Most respondents seem inclined towards sustainability. There are users who aren't sure and may require further information or incentives to fully commit to choosing sustainable spaces despite the higher cost.

Barriers and Concerns

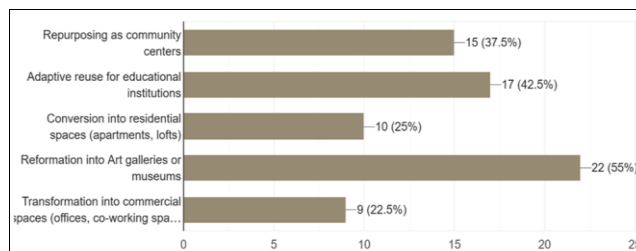


Fig 9: Which adaptive reuse functions do you find most appealing for heritage building?

Inference and interpretation

The most appealing adaptive reuse functions for heritage buildings seem to revolve around community-focused activities, educational purposes, cultural showcases (such as art galleries or museums), residential use, and to a lesser extent, commercial activities. This suggests a diverse interest in utilizing heritage structures for purposes that benefit the community, education, and cultural preservation.

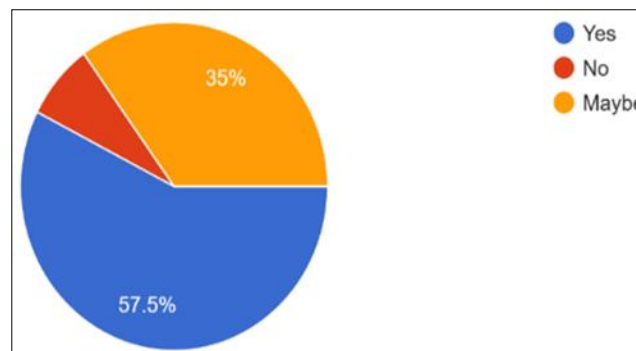


Fig 10: Should the government involve the public in decisions regarding the adaptive reuse of heritage buildings?

Inference and interpretation

Most respondents across various age ranges lean towards the opinion that the government should involve the public in decisions. This indicates a widespread sentiment that public input and participation are crucial considerations in preserving and repurposing historical structures.

Data Analysis: The survey intends to collect perspectives and preferences from architects and designers regarding their experiences for the adaptive reuse of heritage buildings.

1. Name
2. Occupation:
3. Years of Experience:
4. What factors do you consider when evaluating the reuse of heritage buildings?
5. What sustainable interior features do you find most appealing in a repurposed heritage building?
6. What challenges do you foresee in the adaptive reuse of

- heritage buildings for sustainable interiors?
7. What factors do you believe could encourage more adaptive reuse projects with sustainable interiors?
 8. Have you worked on any projects involving the adaptive reuse of heritage buildings with sustainable interior design? If yes, could you briefly describe the project and the sustainable design strategies implemented?
 9. Would you be interested in participating in community workshops or events related to the adaptive reuse of heritage buildings?
 10. Which types of heritage buildings do you think are best suited for adaptive reuse with sustainable interiors?
 11. Which adaptive reuse functions do you find most appealing for heritage buildings?
 12. In your opinion, what functions could be incorporated into adaptive reuse projects for heritage buildings?
 13. Do you have any additional thoughts, suggestions, or comments regarding adaptive reuse of heritage buildings with sustainable interiors?

Analysis through Designer opinion

Demographic Information

Name

1. Anusha Shetty
2. Nikhil Naidu
3. Pooja HS
4. Raksha Shetty
5. Mohamed Rafiq
6. Tulsi
7. Chennakeshava H
8. Dr Nischay
9. Pratheek S
10. Chirag B Shetty

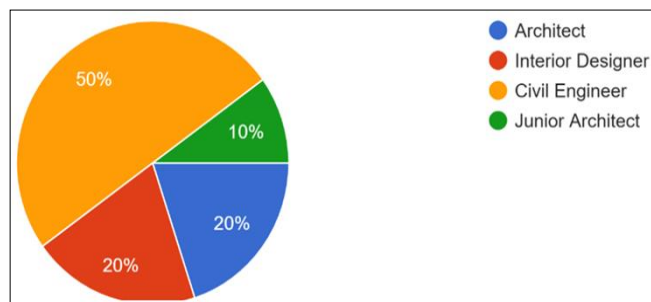


Fig 11: Occupation

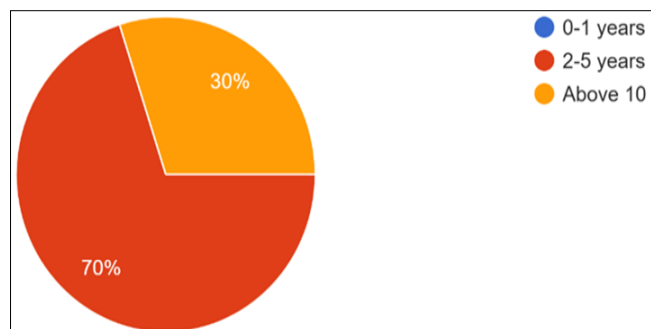


Fig 12: Years of experience

Preferences and Opinions

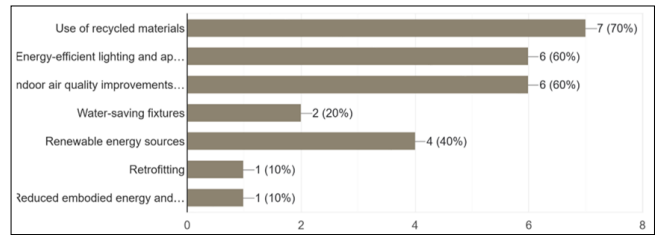


Fig 13: What sustainable interior features do you find most appealing in a repurposed heritage building?

Inference and interpretation

The most prevalent sustainable interior features desired in repurposed heritage buildings are the use of recycled materials, energy-efficient lighting/appliances, indoor air quality improvements, green spaces, water-saving fixtures, and a focus on renewable energy sources. Priority lies in sustainable material use and enhanced energy efficiency for environmental consciousness and comfort.

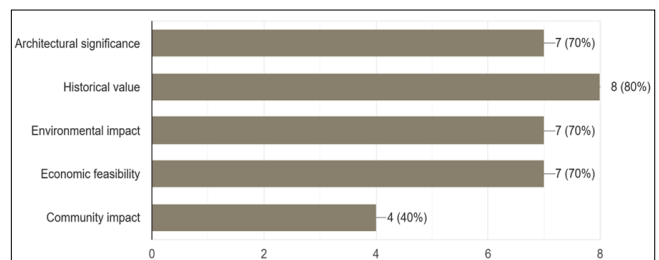


Fig 14: What factors do you consider when evaluating the reuse of heritage buildings

Inference and interpretation

Based on the provided responses, the primary considerations are architectural significance and historical value, followed by environmental impact, economic feasibility, and community impact. This indicates a multifaceted approach, valuing heritage preservation alongside sustainability and community relevance in adaptive reuse decision-making.

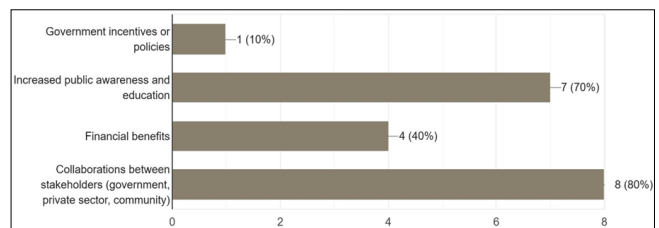


Fig 15: What factors do you believe could encourage more adaptive projects with sustainable interiors?

Inference and interpretation

Collaboration appears as a recurring subject, underlining the significance of collaboration between the government, commercial sector, and communities. Furthermore, the need of increased public knowledge and education about sustainability is echoed throughout the comments. Financial benefits, along with government incentives or laws, are also mentioned as key factors in encouraging such projects,

emphasizing the necessity for a comprehensive approach that addresses these interwoven parts to create more sustainable adaptive reuse programs.

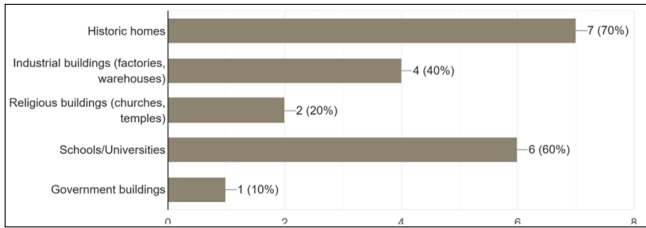


Fig 16: Which types of heritage buildings do you think are best suited for adaptive reuse with sustainable interiors?

Inference and interpretation

Additionally, there's notable interest in repurposing industrial buildings (factories/warehouses) and religious structures (churches/temples) for sustainable adaptive reuse. The inclination toward repurposing multiple types of heritage buildings reflects a diverse interest in preserving various architectural styles, highlighting a collective desire for sustainable preservation across different historical structures.

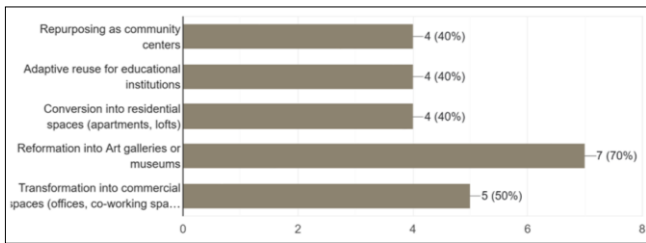


Fig 17: Which adaptive reuse function do you find most appealing for heritage buildings?

Inference and interpretation

From the responses gathered, it's evident that repurposing heritage buildings into community centres, educational institutions, residential spaces, art galleries, and commercial spaces are appealing adaptive reuse functions. The trend suggests a diverse interest in utilizing these buildings for multifaceted purposes, catering to community needs, education, culture, and commerce. The focus on repurposing for community-centric activities like education and art signifies a collective interest in preserving heritage while serving contemporary societal requirements, embracing a harmonious blend of history and modern utility.

Barriers and Concerns

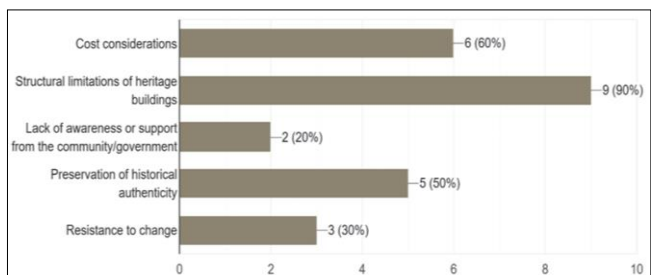


Fig 18: What challenges do you foresee in the adaptive reuse of heritage buildings for sustainable interiors?

Inference and interpretation

Predominantly, respondents highlight structural limitations inherent and cost considerations and in heritage structures. Preservation of historical authenticity and the resistance to change also stand out as significant concerns. Additionally, the lack of awareness or support from the community/government poses a noteworthy challenge. These findings underscore the multifaceted obstacles that must be addressed for successful integration of sustainable interiors within heritage buildings.

Experience and Engagement

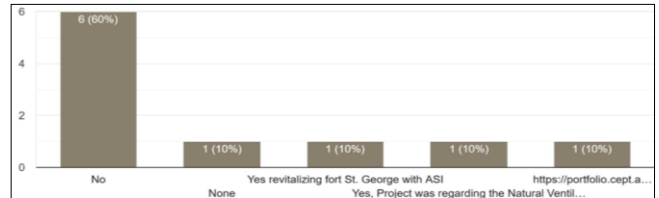


Fig 19: Have you worked on any projects involving the adaptive reuse of heritage buildings with sustainable interior design? If yes, could you briefly describe... and the sustainable implemented

Inference and Interpretation

Examples include the transformation of Maharaja's Saloon into a Transit- Boutique Hotel in Vadodara, revitalization of Fort St. George with ASI, and a project focused on natural ventilation and sustainable furniture using reused teak furniture. These anecdotes highlight a diverse range of initiatives, emphasizing repurposing heritage spaces and implementing sustainable design strategies for conservation and functionality.

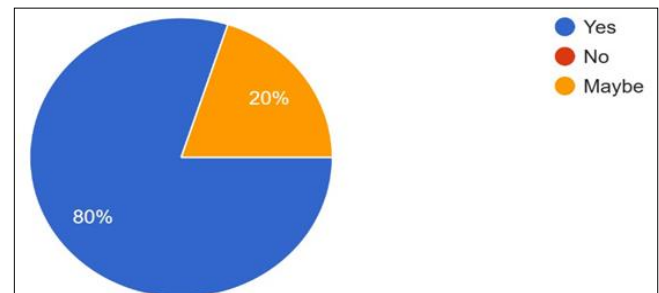


Fig 20: Would you be interested in participating in community workshops or events related to the adaptive reuse of heritage buildings?

Inference and interpretation

From the responses collected regarding interest in participating in community workshops or events related to adaptive reuse of heritage buildings, it's evident that a majority, indicated by 80%, expressed a definite interest (7 out of 10 respondents said "Yes"). The term "Maybe" was chosen by 2 respondents, showing a slight hesitation. This data suggests a generally positive inclination towards involvement in such events, signifying potential community engagement and interest in the preservation and adaptive reuse of heritage buildings.

Suggestions and Feedback

In your opinion, what functions could be incorporated into adaptive reuse projects for heritage buildings? 10 responses.

Inference and interpretation

Based on the 10 responses gathered, it's evident that opinions regarding functions for adaptive reuse projects in heritage buildings vary widely, often depending on the building's specific context. Several respondents highlighted the importance of integrating cultural functions into such projects, emphasizing the preservation and revitalization of cultural values. Additionally, the concept of reducing material footprint was mentioned, indicating a focus on sustainable practices. Several respondents proposed social gatherings, commercial spaces, or converting the buildings and surrounding areas into public parks or green spaces, indicating a desire for community-oriented utilization. Overall, these responses underline the need for adaptive reuse projects to balance preservation, sustainability, cultural significance, and community engagement to ensure the effective repurposing of heritage buildings.

Do you have any additional thoughts, suggestions, or comments regarding adaptive reuse of heritage buildings with sustainable interiors? 10 responses.

Inference and Interpretation

- The respondents who offered feedback showed a positive inclination towards the idea of adaptive reuse with sustainable interiors, indicating an appreciation for the concept.
- There's a consensus among respondents about the importance of proper utilization of space.
- A suggestion was made to focus on adaptive reuse projects in schools, industries, and warehouses rather than commonly chosen spaces like temples or old architecture. This indicates a perceived uniqueness in these alternatives.
- The recommendation to refer to organizations like INTACH and explore past projects indicates a willingness to leverage existing resources and expertise in similar ventures.
- Respondents emphasized the importance of considering client preferences and governmental regulations when implementing design factors for adaptive reuse projects.

Hypothesis statement

H₁: Does implementing sustainable interior design in the adaptive reuse of heritage buildings contribute significantly to environmental preservation and cultural conservation?

H₂: Adaptive reuse of heritage buildings.

Design proposal

- **Historical Preservation:** Conduct a comprehensive assessment of the building's historical elements, respecting and preserving original features such as facades, ornamental details, and significant structural elements. Incorporate adaptive reuse strategies that do not compromise the integrity of the heritage structure.
- **Sustainable Materials:** Prioritize the use of recycled, locally sourced, and environmentally friendly materials for interior finishes, furniture, and fixtures. Consider materials with low embodied energy and high durability to reduce life cycle impacts.
- **Energy-Efficient Systems:** Integrate energy-efficient

HVAC systems, lighting, and insulation to minimize energy consumption. Implement renewable energy sources where feasible, such as solar panels or geothermal heating/cooling systems.

- **Natural Light and Ventilation:** Maximize natural light penetration and airflow throughout the building by strategically placing windows, skylights, and ventilation systems. Use shading devices and smart controls to optimize daylighting and reduce reliance on artificial lighting.
- **Flexible and Multi-functional Spaces:** Design adaptable interiors that can accommodate diverse functions. Employ modular furniture and partitions to allow for flexible space utilization and reconfiguration as needed.
- **Indoor Air Quality:** Prioritize indoor air quality by choosing non-toxic, low-emission materials, and integrating adequate ventilation systems. Incorporate indoor plants to improve air quality and create a healthier environment.
- **Smart Technology Integration:** Incorporate smart technologies for energy monitoring, efficient resource management, and user-controlled systems to enhance sustainability and occupant comfort.
- **Green Spaces:** Incorporate indoor plants and greenery to improve air quality and create a healthier indoor environment.
- **Educational Displays:** Implement informative displays or exhibits within the interiors to educate visitors about the building's history, sustainable practices, and environmental significance.

Reflection

The adaptive reuse of heritage buildings with sustainable interiors prompts a profound reflection on architectural conservation, environmental responsibility, and societal progress. It signifies a harmonious blend of preserving historical legacies while embracing contemporary needs. By repurposing these buildings instead of demolishing them, we can retain their unique charm and character while reducing waste and the carbon footprint associated with new construction. The impact of such projects is significant, as they contribute to the revitalization of urban areas, promote cultural heritage, and inspire sustainable design practices. It calls for an appreciation of the architectural heritage, fostering a sense of connection between the past, present, and future through conscientious design.

Impact

The influence of adaptive reuse of heritage buildings with sustainable interiors varies depending on the stakeholder, impacting public opinion, historians, and conservationists. It may improve the quality of public areas, generating a feeling of community pride and identity. Historians value the way adaptive reuse traces the growth of societal requirements and architectural purposes. It highlights the adaptation of heritage structures to modern needs, reflecting society transformations and attitudes. The display of sustainable design concepts inside heritage spaces benefits conservationists by establishing examples for responsible resource usage and conservation in architecture.

Positioning

This practice not only revitalizes aging structures but also champions environmental consciousness. It symbolizes a conscientious effort to reduce ecological footprints with eco-friendly materials, energy-efficient systems, and adaptive technologies. It's not merely about repurposing spaces but about creating living, breathing testaments to time.

By advocating for sustainable interiors within these cherished structures, we champion a narrative that honours the past, engages the present, and safeguards the future. It's a dialogue between tradition and progress, reminding us that preservation isn't stagnant but a dynamic, evolving journey toward a more sustainable and culturally rich future.

Conclusion

On studying and understanding we can conclude that the renovation and transformation of heritage buildings into sustainable spaces displays a dedication to preserve history while embracing a sustainable future in the field of adaptive reuse. This idea promises a harmonic marriage of heritage charm and contemporary practicality through precise design interventions, assuring the preservation of traditional narratives while fulfilling current needs. The interiors not only breathe new life into old structures but also serve as a monument to ethical design practices by utilizing sustainable materials, energy-efficient technologies, and innovative design ideas. Heritage building adaptive reuse not only honors its architectural legacy but also promotes environmental responsibility. This project exemplifies the power of combining history preservation and sustainable design, demonstrating how these structures can stand the test of time, telling stories of the past while contributing to a greener, more sustainable future.

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