

EVALUATING THE PERFORMANCE OF THE HERITAGE “KHIZANA EZZIANIA LIBRARY”: A QUALITATIVE ANALYSIS OF USER PERCEPTION

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ABSTRACT

This study investigates the performance of the Khizana Ezziania Library, a heritage site in Kenadsa, Algeria, through the lens of user perception. The library, a symbol of traditional architecture in the region, serves as an invaluable resource for scholars and the community. Employing a qualitative methodology, the research explores how users experience the architectural and environmental features of the library, focusing on thermal, luminous, and spatial comfort. Data are collected through in-depth interviews, focus groups, and observational studies. The findings highlight the interplay between the library's architectural elements and user satisfaction, revealing key areas for adaptive strategies that balance heritage preservation with contemporary functionality. This study contributes to the discourse on heritage buildings, emphasizing the importance of user-centered evaluations in their maintenance and adaptive reuse.

Keywords: User Perception, Heritage Library, Khizana Ezziania, Qualitative Evaluation, Building Performance, Traditional Architecture.

INTRODUCTION

Libraries have long been cultural repositories, reflecting the societal values, knowledge systems, and architectural advancements of their times. The Khizana Ezziania Library, located in the oasis town of Kenadsa, stands as a testament to the region's rich heritage and traditional architectural style (Mostadi and Biara 2019). Constructed using local materials and designed to adapt to the harsh climatic conditions of the Saharan region, this library offers insights into sustainable design practices rooted in vernacular traditions.

Heritage buildings play a crucial role in preserving cultural identity and fostering community engagement (Berenfeld 2008). The Khizana Ezziania Library, located in the historic oasis settlement of Kenadsa, Algeria, is a prime example of traditional Saharan architecture. Its intricate designs, use of local materials, and unique spatial organization reflect the cultural and environmental context of its time. However, as modern demands evolve, it becomes essential to evaluate such buildings not only for their historical and aesthetic value but also for their functional performance (Hamlili, Dakhia et al. 2024).

The significance of user perception in evaluating building performance has gained traction in recent years (De Wilde 2018). Studies have shown that understanding how occupants interact with architectural spaces can provide critical insights into their functionality and user satisfaction. Unlike quantitative approaches that focus on measurable parameters such as temperature or lighting levels, qualitative methods capture the nuanced experiences of users, including emotional and behavioral responses (Carlucci, De Simone et al. 2020). This study adopts such an approach to assess the performance of the Khizana Ezziania Library, focusing on how its architectural and environmental characteristics influence user experiences.

Traditional architecture in oasis regions like Kenadsa has been studied primarily for its climatic adaptability and aesthetic significance (DE KENADSA). Scholars such as Fathy (1986) have emphasized the importance of vernacular design in creating sustainable and contextually appropriate built environments (Jackson 2005). However, the user's perspective in evaluating the performance of such spaces remains underexplored, particularly in the North African context. Qualitative research methods have proven effective in capturing the nuanced experiences of occupants in heritage buildings. Studies by Hall (2009) and Tuan (1977) underscore the role of spatial perception in shaping user satisfaction and engagement. Moreover, the intersection of cultural significance and functionality in heritage buildings highlights the need for adaptive reuse strategies that prioritize user needs (Hamlili, Dakhia et al. 2024).

Despite these advancements, limited research has focused on heritage libraries in the Maghreb region. The Khizana Ezziania Library, with its unique architecture and historical importance, provides a compelling case for exploring how traditional spaces cater to contemporary user requirements.

RESEARCH METHODOLOGY

This study employs a qualitative approach to understand the perceptions and experiences of Khizana Ezziania Library users. Data collection methods included:

1. **Semi-Structured Interviews:** Conducted with 20 participants, including library staff, frequent users, and occasional visitors. Questions focused on their experiences of comfort, functionality, and the symbolic aspects of the library.
2. **Focus Group Discussions:** Two sessions with five participants each are organized to encourage dialogue and uncover collective insights about the library's design and ambiance.
3. **Direct Observation:** Observations are made during various times of the day to capture patterns of use, spatial interactions, and environmental factors such as light and temperature.

Thematic analysis is used to categorize the data into key themes, enabling an in-depth exploration of user perceptions.

STAGE ONE: PHYSICAL CONTEXT AND CASE STUDY

During the last decades, Kenadsa has undergone significant transformations (DE KENADSA). These shifts influenced its architectural development resulting in various impacts on the environment, different buildings' consumption of energy at different historical phases, which influenced on the other hand user's perception and behaviours of every single historical building (Hamlili, Dakhia et al. 2024).

- Before colonization.
- Post colonization.



Figure 01. Ezziania's Library floor planning.
Source : Ezziania library's archives documentation.

The **Khizana Ezziania Library**, located within the historic **Ksar of Kenadsa**, serves as an exemplary model of traditional Saharan architecture, reflecting a deep understanding of environmental adaptation, cultural heritage, and functional design. Below is a detailed architectural analysis:

URBAN CONTEXT AND INTEGRATION

The library is situated within the compact, labyrinthine fabric of the **Ksar of Kenadsa**, a fortified village structure typical of Saharan oases. Its integration with adjacent structures minimizes thermal exposure and maximizes structural stability. The proximity to the mosque and other community spaces highlights its central role as a repository of knowledge and cultural continuity, emphasizing its significance in the social and educational life of the settlement.

SPATIAL CONFIGURATION

The floor plan reveals a well-organized spatial arrangement characterized by:

- **Central Courtyard:** The library employs a traditional **courtyard layout**, which serves as a multifunctional space, providing natural light, ventilation, and a shaded communal area. This open space is the heart of the building, ensuring connectivity and facilitating passive cooling.
- **Functional Zoning:** The rooms surrounding the courtyard likely include:
 - **Reading Rooms:** Spaces for study and intellectual activities.
 - **Manuscript Storage:** Secure, insulated rooms for preserving valuable historical documents.
 - **Administrative Areas:** Spaces for staff and administrative operations. This functional organization supports the library's dual role as an educational hub and a heritage site.



Figure 02. Central courtyard of Khizana Ezziania. (Source: Authors 2023)



Figure 03. Reading room of Khizana Ezziania. (Source: Authors 2023).

ARCHITECTURAL ELEMENTS

- **Walls and Materiality:** The thick walls are constructed using traditional materials such as **adobe bricks**, **mud**, and **stone**, which are locally sourced. These materials provide excellent thermal insulation, maintaining cool indoor temperatures during scorching summers and warmth during cold winters.
- **Openings and Fenestration:** Windows are small and strategically placed to minimize heat gain while allowing for natural ventilation. The use of wooden shutters and latticework enhances privacy and reduces glare.
- **Roofing:** Flat roofs, typical of Saharan architecture, likely incorporate local materials and techniques to protect against rain and sandstorms while providing additional insulation.



Figure 04. Architectural elements of Khizana Ezziania. (Source: Authors 2023).

CLIMATIC ADAPTATION

The design reflects a profound sensitivity to the harsh climate of the region:

- **Thermal Comfort:** The compact form and shared walls with adjacent structures reduce exposure to external heat and cold.
- **Natural Ventilation:** The courtyard acts as a thermal regulator, allowing hot air to rise and cooler air to circulate within the spaces.
- **Solar Control:** Overhangs, shaded areas, and narrow alleys within the ksar create microclimates that reduce solar exposure.

CULTURAL AND SYMBOLIC SIGNIFICANCE

The library is more than just a functional space; it is a **repository of cultural heritage**, housing manuscripts and documents that reflect the intellectual history of the region. Its architectural features are imbued with cultural symbolism:

- **Courtyard:** Represents the social and communal nature of Saharan settlements.
- **Decorative Elements:** The minimal yet elegant design reflects the austere beauty of the desert environment while maintaining a connection to traditional Islamic art and architecture.

SUSTAINABILITY AND VERNACULAR DESIGN

The library's design embodies principles of **sustainable architecture**:

- **Energy Efficiency:** Reliance on natural ventilation and lighting reduces the need for mechanical systems.
- **Local Materials:** Use of earth-based construction materials aligns with eco-friendly practices and reduces embodied energy.
- **Water Management:** The ksar's proximity to an oasis suggests an integrated approach to water collection and usage, essential for the building's operation and maintenance.

PRESERVATION CHALLENGES

As a heritage structure, the Khizana Ezziania Library faces several challenges:

- **Environmental Degradation:** Sandstorms, temperature extremes, and limited maintenance may threaten the structural integrity of the building.
- **Urbanization Pressures:** Encroachment and modern interventions could compromise the authenticity of the site.
- **Tourism vs. Conservation:** Increased visitor activity may strain the building's capacity and necessitate adaptive reuse strategies.

Table 01. Represents architectural analysis of the **Khizana Ezziania Library**. (Author, 2024)

Aspect	Analysis
Urban Context	Located in the compact and fortified Ksar of Kenadsa, the library integrates seamlessly with the urban fabric, minimizing thermal exposure and maximizing stability. Proximity to the mosque underscores its cultural and social importance.
Spatial Configuration	- Central Courtyard: Provides light, ventilation, and a shaded communal area. - Functional Zoning: Includes reading rooms, manuscript storage, and administrative areas for efficient operation.
Walls and Materials	Built with locally sourced adobe bricks, mud, and stone, the thick walls offer exceptional thermal insulation for both summer and winter climates.
Openings and Fenestration	Small, strategically placed windows minimize heat gain while allowing natural ventilation. Wooden shutters and latticework enhance privacy and diffuse harsh light.
Roofing	Flat roofs made of local materials protect against sandstorms, rain, and heat while offering additional insulation.
Climatic Adaptation	- Compact form and shared walls reduce external heat exposure. - The courtyard enables natural ventilation and acts as a thermal regulator. - Overhangs and shaded areas mitigate solar heat gain.
Cultural Significance	Symbolizes Saharan heritage and intellectual history. The courtyard fosters community, and minimalistic design reflects the austere beauty of the desert, influenced by Islamic architectural traditions.
Sustainability	- Utilizes natural ventilation and lighting, reducing energy consumption. - Construction relies on low-impact, locally sourced materials. - Proximity to the oasis integrates water management practices.
Preservation Challenges	- Environmental degradation from sandstorms and extreme temperatures. - Risk of losing authenticity due to urbanization. - Balancing conservation with increased tourism demands.

The Khizana Ezziania Library stands as a testament to the ingenuity of traditional Saharan architecture. Its thoughtful spatial configuration, climate-responsive design, and cultural significance underscore the need for its preservation. Through adaptive reuse and sustainable conservation practices, the

library can continue to serve as a beacon of knowledge and heritage in the arid landscapes of Kenadsa.

Stage two: Subjective Approach and Used Questionnaire:

This **questionnaire framework** draws directly from user experiences with sensory and behavioral elements in indoor environments, providing detailed insights into how users interact with and perceive heritage spaces like the Khizana Kandousia Library.

Table 02. Represents the construction of the 07 questionnaires
(Author, 2024)

Category	Questions	Purpose
1. General Experience	- How would you describe your overall experience in the library? - What do you think makes this library unique compared to others?	To understand the general user satisfaction and initial impressions. To identify the cultural and architectural distinctiveness of the space.
2. Spatial Functionality	- Are the spaces within the library easy to navigate and use? - Are there any areas within the library that you feel are overcrowded or underutilized?	To assess the spatial layout and functionality. To evaluate the effectiveness of space allocation.
3. Environmental Comfort	- How comfortable do you feel in terms of lighting, temperature, and acoustics in the library? - Are there any specific areas where you feel uncomfortable? Why?	To gather user perceptions of environmental conditions such as lighting, thermal comfort, and sound. To identify problem zones within the library.
4. Architectural Features	- What do you think about the traditional design elements of the library?	To gauge user appreciation of traditional architectural features.

	- Do you feel that the building design enhances or hinders your experience?	To assess the influence of architectural elements on user behavior and satisfaction.
5. Cultural Significance	- What does this library mean to you personally or to the community?	To explore the cultural and emotional value of the library for users.
	- How well do you think the library preserves its historical identity?	To evaluate the perceived cultural authenticity of the building.
6. User Interaction	- How do you typically use the library? For reading, research, or other purposes?	To analyze user behavior and activities within the space.
	- Are there any specific spaces or features you prefer when you are in the library?	To understand user preferences and interaction with specific spaces.
7. Suggestions for Improvement	- What changes would you suggest to improve your experience in the library?	To gather user recommendations for enhancing the library's performance.
	- Are there any additional features or spaces you would like to see in the library?	To identify user needs and areas for potential development.

This table highlights the structured approach used to engage participants and collect meaningful insights about their experiences and perceptions of the library's architectural and cultural performance.

RESULTS AND DISCUSSION

The qualitative analysis revealed several key findings:

1. *Thermal Comfort:*

Users noted significant variations in thermal comfort, influenced by the library's traditional architecture. Thick walls and small windows provided insulation, maintaining cooler indoor temperatures during the hot summer months. However, during winter, some areas of the library

felt uncomfortably cold, particularly those with limited sunlight exposure.

2. *Luminous Environment*

The library's natural lighting, achieved through strategically placed openings, was generally appreciated by users. However, some areas are deemed too dim, necessitating the use of artificial lighting, which is perceived as inconsistent and inadequate.

3. *Spatial Organization*

The library's layout, characterized by narrow corridors and high ceilings, is praised for its aesthetic appeal but criticized for limiting accessibility and creating challenges in navigation. Users also expressed concerns about the lack of dedicated spaces for collaborative work.



Figure 05. Deemed areas in Khizana Ezziania need Artificial lighting. (Source: Authors 2023).

4. *Cultural Significance*

Users highlighted the library's role as a cultural and intellectual hub, valuing its preservation of local heritage. However, they also stressed the need for modern amenities to enhance its functionality without compromising its historical integrity.

5. *Spatial Comfort and Functionality*

Users expressed mixed perceptions regarding the library's spatial comfort. Positive feedback highlighted the thermal regulation provided by thick adobe walls, which maintained a cool interior even during peak summer temperatures. However, some participants noted challenges related to lighting, particularly in reading areas that relied on limited natural light.

Key Observations

- **Strengths:** Thermal comfort is consistently rated high, with users appreciating the passive cooling effect.
- **Limitations:** Insufficient lighting in certain areas was a common concern, impacting the usability of reading spaces.

6. *Cultural Resonance :*

Participants emphasized the cultural significance of the Khizana Ezziania Library, describing it as a "symbol of Kenadsa's identity." The library's design, with its intricate wooden doors, geometric patterns, and courtyard, evoked a sense of pride among users.

Key Observations

- **Strengths:** The library's architecture is praised for preserving traditional design elements and fostering a connection to local heritage.
- **Limitations:** Some users expressed concern about the lack of interpretive signage or guided tours to help visitors understand the library's historical context.

7. *Interaction with the Built Environment:*

The study revealed how users adapted to the library's spatial constraints and opportunities. For instance, some visitors preferred to use shaded courtyard spaces for informal discussions, while others sought quieter corners for focused reading.

Key Observations

- **Strengths:** The courtyard is identified as a versatile space that enhanced user experience.
- **Limitations:** Overcrowding during peak hours detracted from the overall ambiance and comfort.

CONCLUSION

The Khizana Ezziania Library exemplifies the potential of traditional architecture to meet contemporary needs while retaining cultural significance. This study highlights the importance of user-centered evaluations in assessing the performance of heritage buildings. By addressing identified challenges, such as lighting improvements and enhanced interpretive resources, the library can better serve its community and preserve its historical value.

Implications for Practice

- **Adaptive Reuse:** The findings underscore the need for interventions that respect the library's heritage while improving its functionality.
- **Community Engagement:** Incorporating user feedback into decision-making processes ensures that preservation efforts align with contemporary needs.
- **Policy Recommendations:** Heritage preservation policies should prioritize qualitative evaluations to capture the lived experiences of building occupants.

Further studies could explore the integration of digital tools to enhance user engagement and accessibility in heritage libraries. Comparative analyses with other traditional buildings in the region may also provide broader insights into the role of vernacular architecture in contemporary contexts.

The study faced several limitations that should be acknowledged. Methodologically, relying solely on qualitative methods may not capture quantitative trends, and the subjectivity of user responses in interviews and focus groups could impact the reliability of the findings. The sample size was limited due to time and resource constraints, potentially restricting the diversity of participants and their perspectives. Additionally, focusing on a single case study, the Khizana Ezziania Library, means the results are specific to this context and may not be generalizable to other heritage buildings with different architectural or cultural contexts. The study was also conducted over a short period, limiting the ability to account for seasonal variations, such as changes in temperature or lighting conditions. Environmental factors, such as potential disruptions from ongoing activities within the library, may have influenced user behaviors and perceptions. Lastly, challenges in analyzing and interpreting complex sensory and behavioral data may have led to some oversimplification.

of nuanced user experiences. These limitations emphasize the need for cautious interpretation of the results and suggest areas for improvement in future research, such as employing mixed methods, expanding the participant pool, and examining multiple heritage sites to provide more comprehensive insights.

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