

ADAPTIVE REUSE AND PEOPLE'S PERCEPTION OF CONTEMPORARY NEEDS: TOWARDS A DECISION-MAKING PROCESS TO INCLUDE PEOPLE IN REPURPOSING CAIRO'S HERITAGE

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Abstract. Previous studies have shown a strong correlation between people's positive perception of functions for adaptive reuse buildings with their historical compatibility. With the growing significance of adaptive reuse in the MENA region, an investigation of three case-studies in Cairo was undertaken to uncover (1) the different typologies of function interventions, (2) people's perception of functions in conjunction with their façades and relevance, (3) enhance the design-making process to incorporate people's perception prior to conservation practices. An interpretive study with a purposive sample for survey and semi-structured interviews was conducted in Cairo followed by enhancing a decision-making process for people's inclusion. The three case-studies were selected to represent different interventions of adaptive reuse: Bayt El-Kretliya, a medieval courtyard house becoming a museum; Consoleya Building, the French Consulate in colonial Egypt during the 1930s becoming co-working space; Dar El-Kotob, governmental institution in late 19th century becoming a contemporary museum and library archives. People's perception to Dar El-Kotob's inner-functions was the highest due to a number of issues: (1) a hybrid combination of insertions, installations and intervention, (2) the building's new narrative aligns with the original function, (3) affordability of access. Based on the investigation, four aspects are key to people's perception of adaptive reuse buildings (1) harmony, (2) relevance, (3) evolutionary. An enhanced decision-making process for developing inner-functions of adaptive reuse buildings has been introduced incorporating the four issues of research contribution for future application.

Keywords: *Heritage, adaptive reuse, decision-making, people's perception, Cairo.*

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1. Introduction

This article identifies the gap in today's adaptive reuse practices that are disjunct from people's perception of their inner-functions and future possibilities. Often located outside the decision-making process, the inner-functions of adaptive reuse are being reconfigured through neoliberal private-public partnerships to attune with contemporary needs (Hassan *et al.*, 2020) without people. Research has focused on the role of experts and technocrats as central in the process of heritage conservation (Othman & Mahmoud, 2020; El-Husseiny & Ossama, 2020), acting as patrons and protectorate of

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historical buildings, yet research on people's perception remains understudied. Attempts of people inclusion in heritage have been limited to community participation *after* conservation (Shehata, 2014), where the role of community in determining the path of heritage conservation is subsumed to an after-effect of planning - sometimes, staged by performances of "participation", "empowerment" and "engagement" (Morsi, 2020).

Vafaie et al. (2023) show that the success factors of adaptive reuse lie within a multi-stakeholder decision-making model arguing that conserving heritage requires an attentive consideration to the overlap of paths, initiatives, efforts, layers of evolution and years of practice, with the presence of people, elected municipalities and grassroots, to co-lead the process *together* with experts. Such process of inclusion in the planning phases of decision-making for adaptive reuse ensures its extended life-span, acknowledging that inner-functions encompass social, economic and environmental factors (Moosa, 2018; Ragheb & Naguib, 2021).

Through an interpretive research, the paper develops such a decision-making model for adaptive reuse based on three different typologies of interventions to examine people's perception. Bullen and Love (2011) define adaptive reuse as the renovation and reuse of pre-existing structures and buildings for new determinations. Fisher-Gewirtzman (2016) explains that new functions are a form of *heritage renewal* that requires a study trajectory to include stakeholders and trace their perception of existing and future developments.

Currently, there is an upsurge of adaptive reuse buildings in Cairo due to the relocation of governmental buildings and many old institutions from Downtown Tahrir to the New Administrative Capital (El-Husseiny, 2022; 2023). Some historical buildings are rehabilitated as banks or office buildings (Mourad *et al.*, 2021), others are appropriated for contemporary needs such as co-working spaces under the name of "the creative city" and entrepreneurial spirit (Mourad *et al.*, 2024), others are rehabilitated in the normative sense of museums and schools (Farrag & Abouhadid, 2018), shopping malls (Bullen, 2007), universities and hospitals leading to potential frictions between the original designs and their spatial rearrangements (El-Hadedy & El-Husseiny, 2021). Such growing demand instantiates a cohesive mechanism for adaptive reuse and decision-making process within a well-planned strategy for the typology of functions and distribution across the city together with people's needs and perception. According to Elsorady (2014), a thorough conservation practice comes from understanding the relationship between the exterior skin with the interior usage from relevance, compatibility and more significantly how people perceive them.

Hence, the main focus of the research is to explore the question of harmony and dissonance between the renovated physical structure and exterior of historic building and the function it is adapted to and how members of society perceive this relationship between the visual appearance of the building and its usage. The study involves literature analysis, observations on site sociological surveys and some theoretical considerations. As a result, the authors present enhanced model of decision-making process of adaptive re-use.

In doing so, the article conducts a survey and semi-structured interviews with a purposive sample of users for three different typologies of adaptive reuse in Cairo. Based on the findings, four issues have been identified that can benefit decision-makers when considering inner-functions from people's perception. Based on previous literature for decision-making models of adaptive reuse in Europe, the paper proposes

an enhanced model based on Cairo with the hope of gaining attention to people's role in imagining the future of adaptive reuse. Specifically, three overarching questions are investigated:

1) What are the different inner-function interventions for adaptive-reuse buildings?

2) How do people perceive the inner functions' interventions in relation to the building's history and character of the external façade?

3) How to enhance a design-making model to incorporate people's perception of proposed interventions?

This investigation is timely due to the booming adaptive reuse approach in Cairo and the MENA region. In dense historical neighborhoods, the creation of new building typologies, functions and public spaces comprise a challenge due to limited vacant land. Appropriating historical buildings to incorporate new spatial typologies that break away from classical inner-functions and ordinary interventions can render a new socio-spatial relationship between people and heritage. To incorporate people's perception in the decision-making model of heritage's future trajectory would safeguard its longevity.

2. Research design

Three case studies are selected to represent the different interventions of adaptive reuse in Cairo, Egypt, namely: Bayt El-Kretliya, a medieval courtyard house in Historic Cairo that has been rehabilitated by French *Comité de Conservation des Monuments de l'Art Arabe* to become a museum and named after a British Colonel (Gayer Anderson Museum); Consolleya Building, which has been the French Consulate in colonial Egypt during the 1930s, located in Khedivial Cairo, Downtown Cairo today and has been rehabilitated by a private real-estate conservator to become a contemporary co-working office space; Egyptian National and Library Archives, Dar El Kotob, a rehabilitated government institution to become a museum located in Bab el-Khalq between the two urban quarters of precolonial Historic Cairo (Islamic Cairo) and Khedivial Cairo (Parisian Cairo). The selected case studies communicate different principles of adaptive reuse demonstrating how functions change variably within the skin of historical buildings.

The paper is structured into four parts. The first part addresses the "literature review" section covering previous work on (1) typologies of inner-function interventions for adaptive reuse, (2) experts' benefit-criteria for adaptive reuse, (3) people's perception of adaptive reuse, (4) decision-making process. The second part covers the research "methodology", justifying the selection of case studies, methods and tools used to investigate the three case studies. Methods involve observational analysis, semi-structured interviews and questionnaire. The third part of demonstrates the research's "results". And the fourth part, "discussion and findings for an enhanced model" section explains the research's contribution with a proposition for an enhanced model of decision-making. Finally, the "conclusion" section recaps the research's significance, limitations and future prospect.

3. Literature review

Typologies of inner interventions

Fisher-Gewirtzman (2016) notes that adaptive reuse of heritage buildings includes three approaches of interventions to accommodate contemporary inner-functions within the skin of heritage: a) insertion: which depicts the addition of new elements harmoniously with the existing envelope; b) installation: entails the integration of compatible additions with the original skeleton and c) intervention: which involves significant changes to blend old and new structures. The selected approach or approaches depends on the new functional needs, building's integrity and authenticity and desired outcomes. Conejos *et al.* (2011) define adaptive reuse as the act of modifying a heritage building to accommodate uses that are different from those originally intended. Experts, conservators and state officials undertake a number of issues, benefit and effectiveness criteria while selecting the inner-function of a historical building to attain social, economic and environmental returns (Bullen, 2007; Dyson *et al.*, 2016). As historical preservation focuses on repairing the old (Spennemann, 2011), conservation practices must accomplice the skin and skeleton to their multi-layered history (Murtagh, 2005), while rehabilitation involves the possibility of introducing new inner-functions, which entails an intervention approach as laid out by Fisher-Gewirtzman.

Sustainability benefits of adaptive re-use

Adaptive reuse of heritage buildings offers significant sustainability benefits, including social, economic and environmental advantages. Socially, transforming underutilized heritage buildings into vibrant, modern spaces can enhance their longevity and usage, fostering a new social bond between the building and its surroundings while revitalizing the community (Conejos *et al.*, 2011). Involving people in the decision-making process for inner functions can enhance social conviviality and open possibilities for self-financing (Mohamed *et al.*, 2017). Economically, successful adaptive reuse requires evaluating the potential market, social fabric, surrounding demographics, development type and competition, alongside the building's location, services and accessibility (Murtagh, 2005). Historical, social, technological, environmental and economic values must be equally considered (Austin *et al.*, 1988; Architectural Institute of Japan, 2007; UNESCO, 2009). Environmentally, adaptive reuse can retrofit historical buildings to sustain materials, reduce energy waste and move towards green building standards (Yung & Chan, 2012). This approach lessens the carbon footprint, saves construction costs and revitalizes historical districts by retooling abandoned buildings to meet contemporary needs without new construction (Bullen, 2007; Dyson *et al.*, 2016; Zuo & Zhao, 2014; Zhou *et al.*, 2022).

People's perception of inner-functions

Society is aware of the negligence of historical buildings as an ecological waste and disposal of local identity and cultural heritage and would rather be part of their future plans of development (Othman & Elsaay, 2018). In many cases, public inclusion is dependent on the nature of expertise's and official's personal characters and preference rather than any regulated-driven process of inclusion (Coeterier, 2002). Therefore, the relationship between people and the historical building remains at the level of seeing an exterior façade or roaming its interiors after conservation, without

necessarily participating in rethinking the inner-functions. While exterior facades are significant in shaping public perception, people bond with the narratives and history of the buildings' protagonists and historical figures (Vardopoulos, 2023). Accordingly, various forms of inner-functions may evolve knitting the past's history/histories and present conditions with future potentials. Therefore, a decision-making mechanism needs to be regulated to incorporate officials, experts and conservators. In Egypt, the National Organization of Urban Harmony (NOUH) attempts to create a bilateral function outside the government yet assigned by it, hence people's inclusion remains unregulated and at the grassroots level (Gharib, 2011).

Some studies have shown how the number of local-visits to an adaptively-reuse building is affected by locals' perceptions of inner-functions (Vardopoulos, 2023). At times when people experience a disconnection of inner-functions with the exterior skin, it becomes less legible to discern and connect with heritage. In massive cities like Cairo, where the urban poor comprise a big portion of the population living in informal settlements or pushed away to gated communities and the desert settlements (El-Husseiny, 2015; Hassan *et al.*, 2020), the historical urban cores are becoming less of a destination. A successful application of adaptive reuse enhances the connection between people and heritage (Vafaie *et al.*, 2023), therefore, there is a need to reconsider the relationship between the historical buildings and their contemporary inner-functions. Thus, investigating people's opinions when making plans for adaptive reuse requires a decision-making process engaging experts, municipalities and people (Coeterier, 2002).

Usually decision-making models for adaptive reuse of historical buildings involve various stakeholders and a wide range of international and local experts including World Heritage organizations, national governments and ministries, each with their unique concerns (Haroun *et al.*, 2019). Scholars however advocate for a more holistic approach that democratizes decision-making by incorporating community voices (Mısırlısoy & Günce, 2016).

Initially, the analytic hierarchy process (AHP) structured stakeholder relationships hierarchically (Saaty, 1980), later evolving into the analytic network process (ANP) to balance hierarchical powers and address adaptive reuse (Saaty, 2006), considering interdependent feedback and evaluation criteria. Techniques like the Delphi method facilitated expert input free from hierarchical pressures, though public involvement was lacking. Collaborative rationality, engaging regulators, producers, investors and users with transparency and common goals, proved effective (Aigwi *et al.*, 2021). Spina (2019) expanded social dimensions in decision-making through methods like "Social Multi-Criteria Evaluation" (SMCE) and "New Approach to Imprecise Assessment and Decision Environments" (NAIADE).

As a qualitative approach - towards a simpler analytical structure to engage society, Mısırlısoy and Günce (2016) developed a comprehensive five-step guideline from analyzing 16 heritage buildings across nine European cities: defining actors, analyzing existing fabric, deciding on conservation actions, defining adaptive reuse potentials and deciding on new functions, with feedback loops for a cyclical process (Mısırlısoy & Günce, 2016). This study builds on social collaborative rationality frameworks, particularly Mısırlısoy and Günce (2016), to propose a decision-making model integrating empirical field data (observations, interviews, questionnaires) for future adaptive reuse projects.

Gaps in literature review

A central gap in the literature review of decision-making models is refining the terms of engaging people's perception in adaptive reuse buildings. Many decision-making models are developed through examining European cultural contexts through analytical case studies. In Egypt, policy-makers yet to take people's accounts when it comes to heritage. Over the past decade many studies developed attempts for a decision-making model through a single-case study of conservation practices whether temporarily as in the case of Attaba Market in Cairo (Imam *et al.*, 2020) or strategic development such as Aziza Fahmy Palace in Alexandria (Haroun *et al.*, 2019) or industrial heritage in Minet El-Bassal at Alexandria (Nassar & Eldin, 2013). Building on these incisive investigations, the paper contributes with: 1) integrating a qualitative analysis that is empirically-driven to explore people's perception with regards to adaptive reuse buildings with contemporary inner-functions and 2) enhance a model for decision-making based on multiple inner-functions from insertion, installation and intervention.

4. Materials and Methods

Research tools

A qualitative interpretive research (Groat & Wang, 2013) is adopted to investigate people's perception of the inner-functions of adaptive reuse buildings. The aim is to identify the different layers associated with people's perception of conservation and introduction of inner-functions with their various interventions (insertions, installations and interventions). Three adaptive reuse buildings were selected for the study (Figure 1). The criteria of selection were based on the representation of the three different typologies of interventions and access to buildings. The three interventions of inner-functions for adaptive reuse are: insertion approach (changes are limited to furniture design), installation approach (changes include dividing spaces, adding partitions, decorated walls and new lighting fixtures) and intervention approach (changes encompass influential transformation of main interior space for a phenomenal experiential effect), as based on Fisher-Gewirtzman (2016).

Case Studies

1. Bayt El-Kretliya (Gayer Anderson Museum) at Sayeda Zeinab District, Historic Cairo: Built circa 1631, it was originally a residential medieval courtyard house consisting of two buildings built in the Ottoman Period that was conserved and appropriated as a museum of artifacts.

2. Consoleya Building at colonial Khedivial Cairo in Downtown Cairo: Built circa 1932, it functioned as the French Consulate until 1952 with Egypt's decolonization. The property is now owned by a private real estate, Ismaelia company, which rehabilitated it into a contemporary co-working space inviting youth and entrepreneurs.

3. Dar El-Kotob (Egyptian National and Library Archives), at Bab el Khalq between Downtown Cairo and Historic Cairo: Built circa 1870, the building housed the first library of archives, that was remodeled in the early 2000s, then recently renovated and opened in 2019. Its initial adaptive reuse was designed by architect Ahmed Mito.



Figure 1. Location of the three case studies across Cairo based on Historic Cairo's boundaries
Source: Authors based on Elmenshawy and Shalaby (2022)

Non-participant observations and semi-structured interviews

A total of 30 semi-structured interviews was conducted for users of each adaptive reuse building. The research was conducted between October 2022 and December 2022 over a 4-month period with bi-weekly visits for non-participant observations and another round of questionnaire surveys was conducted between June and July 2024. The questionnaire was circulated and filled in person and it lasted for 10-15 minutes on average. A follow-up set of questions took place in the form of intercept interview for further clarification that lasted for an average of 10 minutes. These questionnaire-survey visits were conducted mostly over weekends. The research subjects included visitors, youth entrepreneurs, librarians, workers, students and local tourist-guides, reflecting the distinct nature of each building and its new target users. Oral consent was taken for research inclusion, data was confidentially stored and anonymous names were used. The interviews represented a sufficient number to stipulate a qualitative response (Dworkin, 2012; Knott *et al.*, 2022). Some semi-structured interviews were intercept interviews that lasted for 10-minutes, while others took up to 20 minutes depending on availability of interviewee's time. The interview's guiding questions were:

1. How long have you been working in the place? /Or why are you visiting? How often do you visit? Do you live nearby?
2. What do you know about the history of the building?
3. What do you think of the inner-space? Which part do you prefer? Why? Is it relevant to the history of the building?

4. From your observation, who are the most common users of the place?

Survey and Questionnaire

A questionnaire was randomly distributed among a diverse group of users. It consisted of six sections, guiding respondents through various levels of understanding adaptive reuse and inner-functions of the case study. The exploratory nature of the study and a commitment to transparency regarding limitations justify the modest sample size, which remains insightful. The target was to gather around 30 responses per historical building, totaling 90 respondents, acknowledging that this is a pilot sample. Despite its size, this sample serves as a preliminary indicator for assessing the phenomenon, paving the way for broader demographic studies. The aim is to identify anomalies among respondents and interviewees, thereby refining a more inclusive decision-making model. By focusing on these pressure points and deviations, the study seeks to enhance the generalizable consensus of existing decision-making mechanisms, regardless of the quantitative limitations.

Section one: Focuses on identifying the respondent and their background.

Section two: Covers general questions about the respondent's knowledge about preservation and adaptive reuse of historical buildings and whether they know about the importance of preservation and agree with the process and the different benefits of rehabilitating a heritage building.

Section three: Exterior images of the three case studies are provided to examine their perceived assumption of the inner-function for each building. No information about the building is provided other than the location and they are asked to select from a given list of options what they believe could be a possible original and new function.

Section four: Interior images - before and after - adaptive reuse of the building are presented, also without prior information about its original function. People are asked to choose what they think could be a possible original and new function for each building.

Section five: In this section, the story of each building is introduced, explaining the transformation and reasons behind it. The respondent is asked to evaluate whether renovating the functions and zoning spaces are suitable and appropriate.

Section six: In the last section, they are asked to generally evaluate the adaptive reuse for each example and whether the rehabilitation practice matches the history of the area and whether the outcome addresses social, economic and environmental benefit to the context.





5. Results



Case studies' analysis

Bayt El-Kretliya, a medieval courtyard-house complex overlooking Ibn Tulun Mosque was transformed into Gayer Anderson Museum circa 1930s. The museum was named after the British colonel, Gayer Anderson, who acquired its title after evicting its original inhabitants. With the help of the French *Comité de Conservation des Monuments de l'Art Arabe*, the new owner conserved the house's façade and its mashrabiya windows. Being committed to its Arab outlook, the house was fantasized as as one of the on-sets of "one-thousand-and-one-Arabian-nights" (El-Husseiny & Ossama, 2020). Rooms were turned into thematic galleries exhibiting the Colonel's travel collections from Southeast Asia, Middle East and Africa. In late twentieth

century, his grandson visited Egypt to update the collections, where the house is now under the endowment of the Ministry of Culture and Antiquities. The inner-function retained an “insertion approach” (Table 1).

Table 1. Adaptive reuse approach of intervention with experts-based benefit analysis

Case Study Intervention Strategy	Exterior Skin		Contemporary Inner-Functions	
<p>Gayer Anderson Museum</p> <p>-</p> <p>Insertion approach</p>	 <p>Medieval Courtyard House</p>		 <p>Exhibition halls</p>	
	<p><i>Social Benefits</i></p> <ul style="list-style-type: none"> • Developing lively places, social nodes and touristic destinations in historical neighborhoods. 	<p><i>Economic Benefits</i></p> <ul style="list-style-type: none"> • Cost saving of new constructions and materials. 	<p><i>Environmental Benefits</i></p> <ul style="list-style-type: none"> • Save building demolition and lower material generation. • Encourages sustainable reduction of land waste. 	
<p>Consoloya Coworking space</p> <p>-</p> <p>Installation approach</p>	 <p>Old French Consulate, administrative building</p>		 <p>Coworking spaces, cafes and meeting rooms</p>	
	<p><i>Social Benefits</i></p> <ul style="list-style-type: none"> • Generate class-based, creative-oriented and entrepreneurial-focused activities. • Flexible interchangeable spaces for different activities. 	<p><i>Economic Benefits</i></p> <ul style="list-style-type: none"> • Employment growth through introduction of new job opportunities albeit not to locals. • Future objective: develop local economy and connect with the community. 	<p><i>Environmental Benefits</i></p> <ul style="list-style-type: none"> • Growth of green building adaptation market in a culture. • Reduction in the consumption of natural resources and energy usage. 	

<p>Dar El-Kotob</p> <p>-</p> <p>A hybrid of insertion, installation and intervention approach</p>	 <p>Old administrative, Khedivial archive, building</p>	 <p>National library and archival museum</p>	
	<p><i>Social Benefits</i></p> <ul style="list-style-type: none"> • Host educational trips from schools, universities and research centers. 	<p><i>Economic Benefits</i></p> <ul style="list-style-type: none"> • Not available 	<p><i>Environmental Benefits</i></p> <ul style="list-style-type: none"> • Enhance daylighting quality and energy-saving for optimizing performance.

Consuleya building, the French Consulate was at the heart of Colonial Cairo also known as Khedivial Cairo with an urban planning following Haussmann’s Paris. The administrative function of the foreign affair building changed with Egypt’s national independence in 1952. In 2008, a private real estate company *Ismaelia* company bought the estate in Downtown Cairo transforming it into co-working spaces (Mourad *et al.*, 2021). This new typology boomed in Cairo responding to the new wave of entrepreneurial spirit. The conservation of Consuleya concluded in 2018 becoming a central building for co-working spaces in Downtown. With Covid-19 pandemic, the building gained popularity after many institutions applied the “social distancing” restriction and needed more office-cubicles. The building accommodates an adaptive reuse strategy of “installation approach”, where partitions subdivided the floor-spaces to fulfill the needs of “hot desks”, “quiet zones” and interactive workshop/meeting rooms. Various acoustics, lighting fixtures and devices were installed carefully.

Dar El-Kotob was the first administrative archive building in the Middle East. The building belongs to the Khedivial monarch with a neo-Islamic architecture. Surrounded by Abdeen Palace, the building echoes a bureaucratic institutional power. In 1998, a competition was announced to rehabilitate the inner atrium space and turn the building into a digital archival library and museum. Architects were invited to submit proposals. That was the time of the “Bilbao effect” when Frank Gehry’s Guggenheim Museum created a worldwide spectacle. In 2001, architect Ahmed Mito, known for his deconstructive architectural style similar to Gehry, won the competition. Believing in the need to garner change, glass bridges penetrated the historical atrium space with a challenging flying structure to provoke a phenomenal experience of the heritage space. As such, the building followed an “intervention approach”, with “installation” and “insertions”. The monumental effect stipulate contemporary needs and recalls the original building’s spirit.

Non-participant observations and semi-structured interviews

Building 1: Gayer Anderson Museum

The first observation is how the original dwelling space accommodates a museum. The skeleton of the building, interior circulation and rooms’ division still reflect the original function. Visitors sense the domestic effect even if they did not

know the history of the building. Some re-zoning and re-purposing of functions have been done to some rooms. First and second-floor bedrooms, living room, library and dining room hold both their original furniture with Gayer Anderson's artifact-collections. According to the interviewees, there is a consent to how both "insertions" are displayed side by side to showcase the building's story and transformation. For the ground-floor rooms, furniture has been removed except for the birth room and bride's room to display the items used for such occasions. The kitchen and restroom have been transformed into storage spaces. Most interviewees commented on the courtyard and spacious atmosphere of the double-height hall that conveys a meticulous quality of craft for wooden lattice windows; the inner-function reflected the building's origin that communicates to a tourist visitor, without necessarily integrating the locals and reflecting contemporary needs.

Building 2: Consoleya Building

Looking at the façade renovations, the building has the spirit of a governmental embassy-building. As a Parisian style of architecture, visitors expected grand-spaces with a ceremonial classical experience. However, the co-working spaces developed by *Ismaelia* embody a contemporary spirit to fulfill a modern-day function. Some users commented on how the building acted as a "time capsule" with spaces feeling disjunct from their historical origin in a surprising yet delightful way. The spaces have been provided with facilities, technologies and state of the art modern furniture to attract youth specifically, together with entrepreneurs for invigorating the spirit of a "creative class". Visitors vary between graduates, Egyptians returning from abroad to establish their businesses and students of private-universities seeking study rooms equipped with strong internet facility. Also, there is some presence for youth employees working outside their headquarter office or working collaboratively with employees from other firms. The building provides plenty of technological advances with a docile telecommunication infrastructure. As expressed in the interviews, users find the building comfortable and safe to meet for work, study and socialize, particularly girls. Some commented that it is a welcoming, safe and hospitable, "female friendly", allowing different respectful settings for work whether to be alone or in groups. A group of female students mentioned how they come three times a week to study. With the new function of the building, it is becoming a suitable place for Downtown youth's artisans and new start-up businesses to go there when needing a collaborative and productive environment. Yet, the connection between the building's inner-function of contemporary needs and approach of "installations" of subdividing rooms and remaking new articulations is disjunct from its historically well-conserved architectural façade.

Building 3: Dar El-Kotob

Similarly, the exterior façade of Dar El-Kotob delivers an institutional classical expectation. Thus, conservators maintained the grand arches of Islamic identity at the interior and the architect respected the inner skeleton and spatial arrangement and introduced advanced screens as "insertions" and "installations" with new material additions at the ground floor (museum). Yet, the striking contrast was in the re-appropriation of the double-space atrium with high-tech flyover bridge as a striking "intervention" to transport visitors to the rest of the upper-floors (archive and library). The intervention of flying bridge in the "air" embodied today's architectural language to communicate with modern-day users. The articulation of the inner-atrium space enhanced the quality of daylight penetration into the building as mentioned by the

interviewees, creating a pleasant atmosphere and supported the grand monumental feeling of classical and old historical buildings. In contrast, other smaller spaces were dimmer for exhibition purposes and to provide state-of-the-art touch-screens to navigate books and archives digitally. Visitors of Dar El-Kotob were mainly readers, researchers, architectural graduates and students. The hybrid interplay of the different intervention approaches of inner-functions did not override the building's integrity and spatial authenticity.

Analysis of questionnaire responses

The questionnaire was conducted on a sample of 90 participants, randomly selected from groups of various backgrounds and interests between the age of 20 to 50.

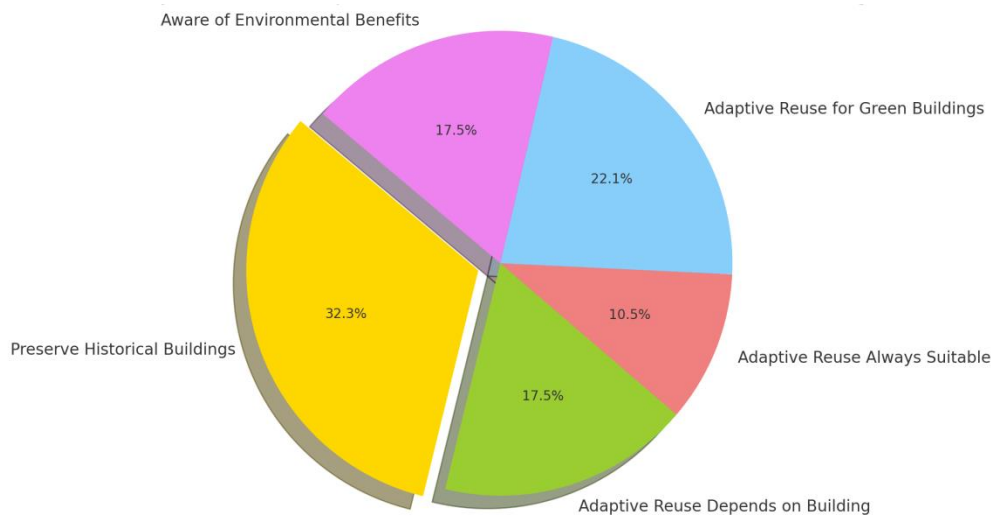


Figure 2. Distribution of the responses to the questions of 1 and 2 survey's sections

The pie chart in Figure 2 illustrates key findings from a survey on the preservation and adaptive reuse of historical buildings. An overwhelming 92% of respondents believe in the importance of preserving historical and heritage structures. When considering adaptive reuse, opinions were more divided: 50% felt its suitability depended on specific building characteristics such as original function, current condition and location, while 30% deemed it suitable regardless of the building's history. A significant 63% agreed that adaptive reuse supports environmentally-friendly building practices. However, only 50% of respondents were aware of the environmental benefits associated with adaptive reuse. These results highlight a strong consensus on the importance of preservation and a general endorsement of adaptive reuse, though with varying levels of awareness and conditional support.

For sections 3 and 4, responses on the compatibility between new and original function were as follow:

For Gayer Anderson Museum, 65% chose that it was initially a residential building and 25% thought it was an educational building. Towards its new adaptive reuse function: 60% believed it can be a museum, while the rest thought it can be a governmental building or educational facility. After looking at the building's interior images before and after: the percentage of people thinking it was originally a residential building was 70% and 75% believe it is a museum now.

For Consoleya Building, 75% thought it was initially a residential building in

Downtown and 25% thought it was a governmental building. When asked about its possible function for adaptive reuse: 40% thought it can be appropriated as a co-working space, 40% as a museum and 20% as a residential building. However, when shown the old interior images: 25% thought it was a residential building and 27% thought it was a governmental building. And when shown the images of the current space: 80% thought it has been rehabilitated into a co-working space and 16% thought it has turned to a museum.

For Dar El-Kotob, 45% of the responses thought it was initially a government building, 45% thought it was a museum and 10% thought it was a library. When asked about its possible function for adaptive reuse: 65% thought it can become a library and museum, 25% thought it can only be a museum and 10% thought it can only be a library. After looking at the old interiors: 40% chose that it was initially a governmental building, 46% thought it was a museum and 14% thought it was a library. And after looking at the new interiors: 60% thought it has transformed into a museum and library, combined.

For section 5, after they have been given the story of each building, they were asked to rate the compatibility of the new inner-function and which of the three adaptive reuse cases was the most appropriate. Section 5 presents the suitability of new functions for three adaptive reuse projects in relation to their exterior façades and surrounding contexts. For the Consoleya co-working space, Most respondents found the new function appropriate, with few dissenting. More than 85% supported transforming the medieval house into a museum, considering its exterior and nearby Islamic monuments like Ibn Tulun Mosque. Almost 90% believed Dar El-Kotob's new function suited its exterior façade and proximity to Abdeen Palace, enhancing the Khedivial era's iconic symbolism. Additionally, 48% felt Dar El-Kotob's reuse was the most fitting in relation to its original function, 44% endorsed the Gayer Anderson Museum's contextual relevance and 24% approved the Consoleya Building's adaptation for contemporary needs. These findings highlight the public's appreciation for adaptive reuse projects that integrate new functions with historical and cultural contexts, underscoring the importance of public perception and contextual relevance for social, economic and environmental sustainability.

6. Discussion and findings for an enhanced model

The decision-making process for adaptive reuse remains a remote undertaking detached from people's perception and community's engagement. The mechanism regulating the process can be enhanced and developed towards a holistic approach (Misirlisoy & Gunce, 2016). Based on the survey, knowing the building's original function and past narrative affected people's responses and perception of contemporary activities. Comparing the three case studies with their different inner-functions made it clear that each application of adaptive reuse made sense in its own right. However, there is some consensus that the most suitable inner-function is consistent with the building's historical narrative with the possibility of becoming an urban catalyst for other forms of economic and social rehabilitation. Based on the findings, the paper extrapolates four registers shaping people's perception of the inner-functions for adaptive reuse buildings:

1. Harmonious with the exterior skin and architectural character,
2. Relevant to the historical narrative of the building,

3. Appropriate to the surrounding context,
4. Evolutionary with respect to contemporary and future needs.

The study analyzed observations, semi-structured interviews and questionnaires to assess people's perceptions of adaptive reuse in three Cairo buildings, focusing on their inner functions through insertions, installations and interventions. The Gayer Anderson Museum's approach of displaying a medieval courtyard house alongside a British Colonel's travel collections added value by preserving historical elements and creating a lively social space (Othman & Elsaay, 2018; Aga Khan Award for Architecture, 2007). The Consoleya building's transformation into a coworking space surprised many positively, highlighting its success in meeting contemporary needs and potential economic benefits, despite concerns about gentrification and the fragmented historical experience (interviews, observations and questionnaires). Dar El-Kotob's adaptive reuse seamlessly blended original and contemporary features, attracting visitors with modern amenities and technological innovations. Overall, the public showed strong awareness and appreciation for adaptive reuse, recognizing the importance of connecting inner spaces with historical and cultural contexts while maintaining heritage objects and practices. The findings emphasized the positive social, economic and environmental impacts of adaptive reuse and suggested that hybrid approaches of insertion, installation and intervention could effectively restore memory and cultural heritage (Fisher-Gewirtzman, 2016; Bullen & Love, 2011; Vafaie *et al.*, 2023). Successful adaptive reuse relies on integrating new functions with original buildings to enhance user experience, as supported by the decision-making models emphasizing contemporary needs and people's perceptions (Mısırlısoy & Gunce, 2016).

These four registers were deducted from analyzing observations, semi-structured interviews and questionnaire. While each case study represents a different inner-function using insertions, installation and intervention as technical solutions, the perception of people takes into consideration the contextual factors, building's narrative, historical continuity, together with social, economic and contemporary needs of the present time (Figure 3).

For Gayer Anderson Museum, after seeing the past-and-present inner setting, people commented on the renewed experience of the building and how the insertion approach of displaying the domestic life of the medieval courtyard house overlaid with the British Colonel's travel collections (chairs, objects and treasured artifacts) was an added knowledge-value. Also, how the new function preserved the skeleton of the building with its well-crafted mashrabiya windows and making it a lively social place, inside-out (Othman & Elsaay, 2018). The approach of using the original furniture of the precolonial era and adding the collection of the colonial era's user preserves the building's lifeline and profoundly showcase the element of time and change with the multiple layers of Egyptian history (Aga Khan Award for Architecture, 2007). Visitors to the Gayer Anderson Museum are more interested in its history and Anderson's collection of artifacts, while locals focus on its relationship with the context.

For the adaptive reuse of the Consoleya building, interviews, observations and questionnaire have shown people's surprise to its inner-function rehabilitation in relation to its outer skin. Such surprise should not be conceived negatively. In fact, views have expressed that it is successful in meeting contemporary needs and opening up the horizon for future transformation of office buildings in the neighborhood of Downtown Cairo. Hence, the adaptive reuse of historical buildings and their evolution to host new functions serve to expand the future becoming of the area and refiguring

new economic benefits, with job opportunities and start-up culture that could sustain new business models in a changing economy. The only tension, however, is that the current target user is highly educated young entrepreneurs as the rental space is relatively unaffordable, making the inner dynamics and overarching atmosphere seems to welcome a particular kind of users, a phenomenon that many urban theorists pointed out to as a process of gentrification. Meanwhile, the adaptive reuse approach of “installation” by subdividing the space has fragmented the historical experience of the French consulate during the 1930s. As much as users enjoyed the cafeteria at the ground floor level with its New York brick-style interior, they highly acknowledged the ballroom at the second floor with the 3-meter art deco mirror and chairs that were preserved from the belle époque era. These objects acted as exhibition-pieces and “go-to” spots to visit and recall the old days.

The adaptive reuse of Dar El-Kotob received the highest score of relevance of inner-functions to the exterior façade in the questionnaire. From the site visits, observations and interviews, the variations of insertions, installations and interventions seamlessly blend the original and contemporary aspects of the building. The archival museum and library attract visitors with its modern amenities and advanced technological innovation. The bold skylight and flyover bridge appeal to users, researchers and a young generation of architects, making it a contemporary attractive space.

In general, the interpretive study has revealed a strong public awareness of the significance of adaptive reuse with a deep appreciation for the restoration of the exterior skin and retooling its inner-functions in various ways. In all three case studies, respondents recognized the importance of connecting the current inner-spaces with the building's history and culture and the possibility of maintaining some heritage objects, artefacts and traditional practices while shaping programmatic activities for the future. The positive impact of adaptive reuse on society, economy and the environment was also acknowledged. The findings highlight the successful transformation of inner-spaces into vibrant, functional areas while maintaining the original essence through thoughtful preservation and adaptation.

To reflect on the practices of adaptive reuse driven by “insertion”, “installation” and “intervention” as inner-function approaches (Fisher-Gewirtzman, 2016), it is obvious from the three cases studies that a hybrid modality of the three practices may serve a number of benefits and may indeed help in restoring memory and cultural heritage. Developing inner-functions and hybrid approaches of intervention by way of people's perception can complement the valuable experts' criteria of benefits (Bullen & Love, 2011; Vafaie *et al.*, 2023). Evaluating the success of adaptive preservation relies on how contemporary users perceive the integration of new functions with the original building. The relationship between old and new as expressed through architectural form and space re-articulations significantly influences users' experience. Successful decision-making models employ tactics to engulf contemporary needs, new functions and people's perception during conservation (Mısırlısoy & Gunce, 2016).

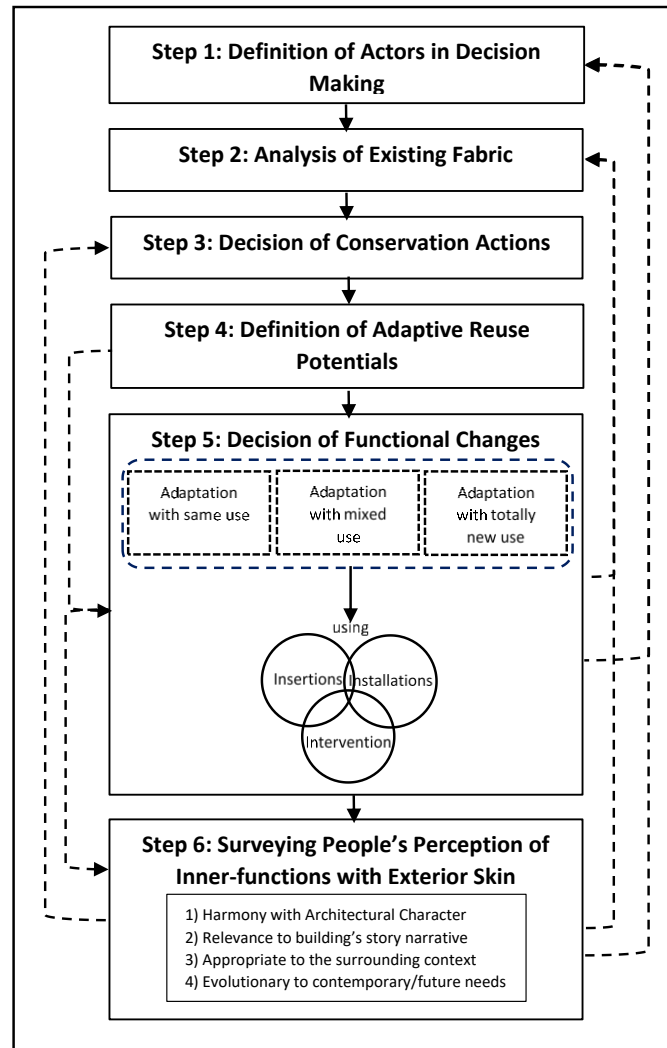


Figure 3. An enhanced model of decision-making process for adaptive reuse
Source: Authors based on (Misirlisoy & Gunce, 2016)

7. Conclusion

This article explored people's perceptions of the inner functions of adaptive reuse buildings within heritage contexts. Through qualitative and interpretive research on three different adaptive reuse buildings in Cairo—a museum, a co-working space and a library/archival museum—the study proposes additional steps to enhance Misirlisoy and Gunce's (2016) decision-making model. The integration of public input into the expert criteria benefit analysis is emphasized, highlighting the importance of involving people in the decision-making process to maintain buildings and extend their life expectancy with social, economic and environmental benefits.

The analysis revealed a shared awareness of conserving heritage for its cultural value while adapting to contemporary needs. Compatibility of intervention approaches and their hybrid modalities were crucial in retrieving the original memory and spirit of buildings. Case studies demonstrated diverse adaptive reuse approaches to engage younger audiences and meet modern needs. Transformations like the Consolaya

building and Dar El-Kotob showcased innovative techniques appealing to youthful users, while the Gayer Anderson Museum attracted a specific audience. Overall, these approaches encourage rehabilitation, transforming neglected buildings into vibrant, dynamic hubs, contributing to economic, social and environmental vitality.

The study's limitations include the short time frame for analysis and site visits, which were conducted bi-weekly over four months, limiting observations and interviews. Additionally, the timing of the visit to the Gayer Anderson Museum on a Thursday afternoon may have affected visitor numbers. The questionnaire responses were also fewer than intended, with only thirty-six responses, insufficient to represent diverse backgrounds. The comparative perspective and urban analysis could have added further insights. For future research, extending the observation period, conducting more interviews and distributing the questionnaire to a larger pool would enhance results. Creating focus groups could also ensure sample variability and reliability. Applying the decision-making process to upcoming adaptive reuse projects would further refine the model. In conclusion, this research was necessary to understand public perceptions of adaptive reuse and heritage building functions.

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