

Exploring Diverse Approaches to Adaptive Reuse in Function in Yogyakarta: Comparison of Omah UGM and Restaurant Lumbung Mataram

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ABSTRACT

Buildings play diverse roles dictated by human activities within them. When a building loses its effectiveness or the owner seeks income without major changes, adaptive reuse can revitalize it. This approach considers architectural and cultural integrity in design decisions, influencing spatial and functional transformations but is this approach accurate in real-life scenarios, and do untrained individuals consider architectural integrity when restoring or adapting buildings? Our research explores adaptive reuse by examining two Javanese houses turned into a museum (Omah UGM) and a restaurant (Restoran Lumbung Mataram). Using qualitative research through surveys and interviews, we compare these buildings to highlight differences in decision-making processes and their impact on cultural and architectural integrity.

By comparing data from these buildings, the research aims to highlight differences in decision-making processes for adaptive reuse and their impact on cultural and architectural integrity of the repurposed buildings.

Keywords: adaptive reuse, architectural, cultural integrity



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1. Introduction

The adaptation of buildings to meet present-day needs poses a dynamic creative challenge. Adaptive reuse, defined as an aesthetic process, strives to tailor buildings for new functions while preserving their historic features. This sustainable approach entails the preservation of the entire building system, encompassing the structure, shell, and interior materials, thereby extending the building's life from inception to decommissioning. While often conducted by experts, some adaptive reuse initiatives emerge organically within communities, with community members actively shaping functional spaces. So, it's crucial to recognize the importance of understanding the adaptive reuse concept before implementing it in old buildings as projection in the case of Omah UGM or otherwise the adaptive reuse can be purely for economical purposes like the case of Restaurant Lumbung Mataram; The approach of changing the function of old houses into various functions is common in big cities in Indonesia, where old houses are frequently transformed into various functions, including restaurants. Adaptive reuse harmonizes between humans and history, and between past, present, and future. Safeguarding the essence of the past while accommodating the

demands of the present and future, this delicate balance finds a resolution in adaptive reuse, a transformative process that breathes new life into aging structures according to the experience of a couple of references like [1], [2], [3], [4], [5].

This research seeks to answer the following questions: How do cultural and architectural integrity guide adaptive reuse decisions in the case studies of Omah UGM and Restaurant Lumbung Mataram? What are the differences in adaptive reuse approaches when comparing community-led initiatives to economically driven projects? The purpose of this research is to examine how cultural and architectural integrity guide adaptive reuse decisions in these case studies. This study aims to compare community-driven adaptive reuse initiatives with economically driven projects, highlighting the importance of preserving historical and cultural elements. Adaptive reuse involves the conversion of antiquated building functions, outdated in services and technology, into spaces that align with contemporary needs. This metamorphosis is achieved by infusing fresh materials and functions while steadfastly preserving the original structure and fabric. Theories such as those articulated by [6] advocate respecting a specific and measured scale of change and emphasizing the preservation of key aspects of integrity during the adaptive process. Preserving and repurposing these buildings becomes not only a practical solution but a vital means of safeguarding the rich cultural history of societies, as underscored by [7], [8], [9], [10].

The 2006 Yogyakarta earthquake was a devastating event that significantly damaged infrastructure, including housing in various areas according to [21]. Kodegede, a historic neighborhood in Yogyakarta, was also affected. In the aftermath, adaptive reuse became a practical solution in the reconstruction efforts. One example is the transformation of damaged or partially destroyed buildings into spaces with different functions, preserving cultural and historical elements while meeting the changing needs of the community. This study focuses on two old houses in Kodegede: Omah UGM and Restoran Lumbung Mataram. These houses have been turned into a museum (Omah UGM) and a restaurant (Lumbung Mataram) through the architectural and cultural integrity of adaptive reuse. There are several scales used in the adaptive reuse method: small scale implemented by minor changes like architectural aspects, medium scale indicating changes of surface or major functions, and large-scale involving remodeling internal and external structures and reconstruction of the building. Additionally, building integrity, as outlined by [6], comprises architectural, constructional, cultural, and structural aspects. This research focuses on the architectural and cultural integrity of Javanese heritage, particularly in the context of these two case studies, which were previously Javanese-style residential buildings before their functional alteration.

By comparing data from these buildings, the research aims to highlight differences in decision-making processes for adaptive reuse and their impact on the cultural and architectural integrity of the repurposed buildings. This comparative analysis will shed light on how various adaptive reuse approaches can influence the preservation of heritage and the adaptation to contemporary needs, providing valuable insights into effective strategies for balancing these often-competing priorities. Through this examination, the study seeks to contribute to a deeper understanding of adaptive reuse practices and their implications for cultural and architectural conservation in Kotagede, Indonesia and beyond.

2. Method

2.1. Research methodology

To delve into how Omah UGM and Restoran Lumbung Mataram are being repurposed, we will use a qualitative research approach. This method involves talking to people involved in transforming these spaces to explore their experiences and perspectives. Finding historical context and gather it from online sources and research papers. Then afterward, We'll conduct on-site interviews with the owners to learn about their motivations, challenges, and decision-making processes in repurposing the structures. We'll also interview frequent users to understand how adaptive reuse affects the community. Additionally, expert interviews that are part of Indonesia's cultural and heritage board will provide insights into the decision-making process for

choosing specific functions in these adaptive reuse projects, giving a comprehensive understanding of the reasoning behind the transformation process and both architectural and cultural integration.

2.2. Research question:

This research has several objectives with answering these questions, namely: (1) To provide an overview of perceptions regarding implementing the adaptive reuse of function concept in preserving cultural and architectural integrity of Omah UGM and Restoran lumbung Mataram ; (2) Explain the importance of efforts to maintain old Javanese buildings as historical values that make up a city's identity like Kotagede area case and prove that preserving old buildings is a better way than destroying them.

3. Result and Discussion

3.1 Literature Review

3.1.1 Kotagede post-earthquake

On May 27, 2006, Yogyakarta and Central Java experienced an earthquake with a magnitude of 5.9 on the Richter scale. The region was struck by multiple aftershocks following the initial quake. The earthquake caused extensive damage, leading to the collapse and destruction of numerous homes and office buildings (Figure 1). Additionally, many heritage sites and structures in the Yogyakarta Special Region and Central Java were significantly affected.

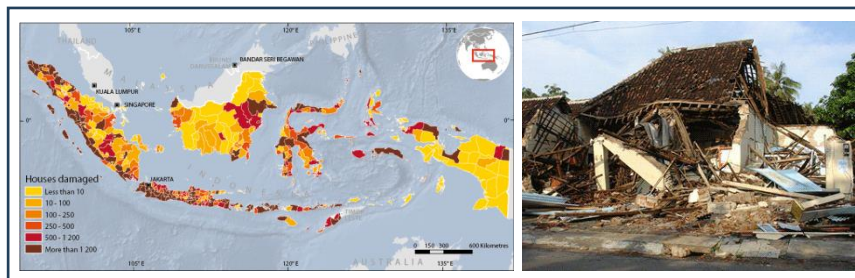


Figure 1 Results of earthquake (a) Houses damaged and destroyed in extensive disasters in Indonesia, 1970-2009; (b) destroyed houses in Yogyakarta

Source: Internet

Kotagede, which was the former capital of the Islamic Mataram kingdom in the 15th century, is known to represent the ideal Javanese village and offers a unique character according to the UNESCO [22]. The 2006 earthquake affected old buildings in Kotagede which were unable to withstand it due to the dominant material being wood and the effects of age. Since the 2006 earthquake, the recovery process in Kotagede has been carried out gradually. Many parties took part, from local communities, conservationists, the government, to local and international private donors. The almost 200-year-old house which is now Omah UGM is one of the old buildings that was able to withstand the earthquake even though it suffered some damage according to [23], [24].

Omah UGM, being renovated as It was and rebuilt the descruptive parts like the Joglo, both of the old couple owning this Javanese dwelling died and then became owned by their only nephew who is an architecture lecturer in UGM, so later on purchased by UGM Department of Architectural Engineering and Planning, Omah UGM currently is used for lecture and research activities at the UGM Department of Architectural Engineering and Planning because of its function as a learning medium for heritage preservation, including disaster risk management for heritage, and even as material for student studio assignments related to heritage architectural design.

On the other hand, Restoran lumbung Mataram being build and has a very long history for 5 decades, It has been affected also by the earthquake on what concerns the architecture and along with the owner that wanted

to have another income after raising his children and them leaving to pursue their life and carrier so the owner wanted to make out of the house that was heritage from his ancestors that came from china to Indonesia to spread Islam a very interesting building that preserve its historical memories. The earthquake has affected the change of the building for some part because the owner became conscious of adding other facilities and by that nowadays the restaurant building is actually combining 2 houses with the same spatial organization (Pendhapa, Gandok, senthong, Senthong Tengah, Pawon, Pringgitan)

3.1.2 Case Study (Omah UGM and Restoran Lumbung Mataram)

The study was based on a case study of two houses that has been transformed only in function into coffee shop/restaurant and the other into a museum which are Omah UGM and Restoran lumbung mataram. They are all located in Kotagede area with the transformation is conducted by either the government or the owner.

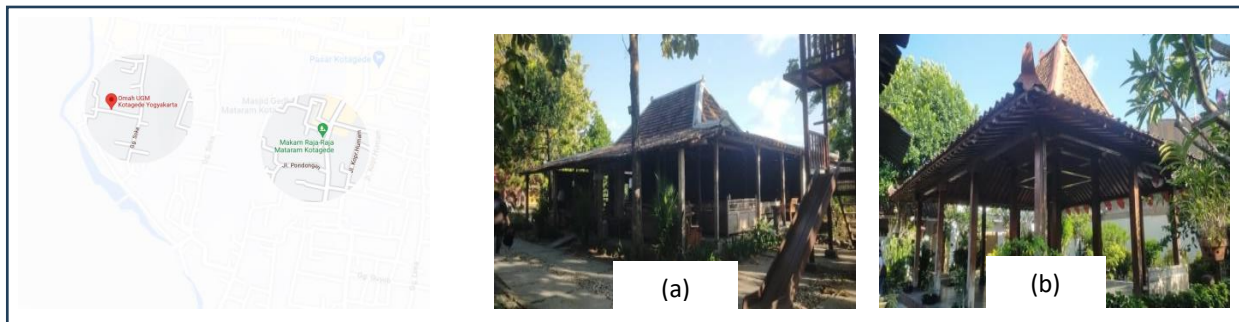


Figure 2 Case Study (a) Omah UGM; (b) Restoran lumbung Mataram
Source: Personal Documentation

The Javanese style houses was built in a distinctive timing ; according to (Figure 2) (a) after the reconstruction of post-earthquake period in 2006 then there's (b) standing in a 270 Years applying a tropical architectural design Joglo houses, traditional Javanese structures, exemplify this approach. Characterized by their intricate wooden carvings, high ceilings, and a spacious layout add up to the distinctive roof design that typically large and intricate, acts as a shield against the tropical sun, contributing to the overall thermal comfort. With different functions; museum that mostly host architecture students to learn about the heritage of Kotagede and Restoran Lumbung Mataram that was a typical Javanese house occupant from certain social class and big family but change to a restaurant attracting people that want to feel nostalgic in this place.

3.1.3 what's adaptive reuse, its measures?

According to [11], [12], there is a need to scientifically evaluate traditional building techniques and address the challenges in preserving building craftsmanship, especially regarding the supply of appropriate materials for the conservation of historic buildings. The conservation of our built heritage should employ a multidisciplinary approach, coordinated by a central body funded by the government. This body would oversee all aspects, from town planning and the preservation of historic buildings to the prevention of damage to their contents through control of the internal environment. Historic town centers require this multidisciplinary approach, with teams led by independent consultants employed by local authorities, as successfully demonstrated in Chester, Chesterfield, and Wirksworth. Future efforts should focus on revitalizing the industrial cities of northern Britain.

That's why the approach of adaptive reuse was introduced so according to [13], [14]. Adaptive reuse is referred to "transforming an unused or underused building into one that serves a new use" and its importance includes not only the reuse of existing structures but also the reuse of materials, transformative interventions, continuation of cultural phenomena through built infrastructure, connections across the fabric of time and space and maintaining memories. Also he mentions the term of 'change of use' as a key aspect quoting: change of use is at the heart of adaptive reuse practice that gives new purpose to an unused or underutilized structure

When It comes to the rules of that change according to [6], [13] there are several key principles to follow. First, changes should be kept to a minimum to preserve the basic structure and character of the building, intervening only as necessary to maintain the integrity of the original design. Second, any new installations should avoid causing unnecessary damage to the building and should not limit the possibility of future adaptations. Third, the architectural style post-reuse should not falsify historical records, and new changes should be clearly distinguishable from the original for future generations to recognize. Fourth, when adding contemporary extensions, consider the contrast between new and old elements, replication, size and volume, color and material harmony, the importance of location, and surface articulations' characteristics. Lastly, the building's interior and exterior should be constructed with durable materials that can be retained for future uses of the building according to [20].

3.1.4 Javanese house components

What makes then a Javanese house, a Javanese house so we can understand what can be changed and what shouldn't be changed as crucial part of any old traditional dwelling; So the distinctive essence of a Javanese house lies in its intrinsic cultural and philosophical underpinnings, guiding both its preservation and adaptation. Built upon profound cosmological principles, the spatial arrangement of a Javanese house embodies a profound connection to Java's societal fabric. Each space within serves a distinct purpose imbued with cultural significance, reflecting the multifaceted role of these dwellings beyond mere private domains—they also serve as integral social artifacts of Javanese heritage [15]. In the Javanese worldview, these houses harmoniously blend physical and spiritual elements. Physically, structures like the pendhapa, resembling a mountain in its frontal aspect, and the dalem with its internal senthong, manifest a structured layout comprising interconnected spaces that symbolically unite physical and spiritual realms. According to [16], [17] the complete structure of a traditional Javanese house includes the following buildings, according to (Figure 3): (1) **Pendhapa**: situated at the front of a Javanese house, this open area with four main pillars (saka guru) serves as a meeting hall; (2) **Pringgitan**: positioned between the Pendhapa and Dalem, this space is used for performances, especially during ruwatan ceremonies; (3) **Dalem**: located at the rear of the house, it is divided into three rooms (Senthong). The central room, Senthong Tengah, functions as a storage area, while Senthong Kiwa and Senthong Tengen, located on either side of Senthong Tengah, are used as bedrooms; (4) **Gandhok and pawon**: The Gandhok is a long room extending along the left and right sides of the Pringgitan and Dalem, while the Pawon, serving as the kitchen, is located at the back of the Senthong; (5) **Gandok**: which refers to an additional building or extension that is attached to the main house. It is typically located on the side or at the back of the main structure. The Gandok can serve various purposes, such as additional living space, storage, or quarters for guests and servants. It helps to expand the functional areas of the house while maintaining the overall architectural harmony of the traditional Javanese home; (6) **Dapur**: means "kitchen." It is the area in a house where cooking and food preparation take place. In traditional Javanese houses, the dapur is often located separately from the main living areas to keep smoke and cooking odors away from the main parts of the house. The kitchen can also be a place where traditional cooking methods and utensils are used, reflecting the cultural heritage of Javanese culinary practices; (7) **kamar mandi**: In Javanese, as well as in Indonesian, this word means "bathroom." It is the room in a house where bathing and personal hygiene activities take place.

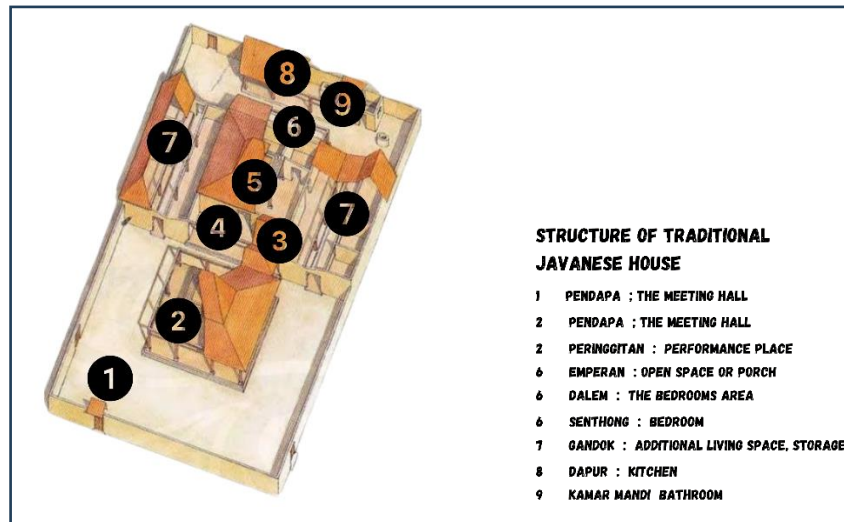


Figure 3 Layout plan of traditional Javanese house

Source: Internet

It's important to make the landscape for basic components of a Javanese house in order to make later a comparison between the previous houses functions and the changed were made in the process of adaptation especially in the part of function.

3.1.5 Douglas's key problem areas in adaptive reuse

Preserving cultural integrity entails ensuring that the new use complements the previous one and acknowledges the evolving roles and functions of historic buildings within their communities. This perspective finds support in the work of [18], [19]. To uphold the integrity and cultural significance of a building during reuse, it is crucial that the historic site's original cultural significance remains unaffected, even if different materials are employed. Architectural integrity allows for significant alterations to the building's interior while preserving its exterior. The utilization of original building materials, whenever feasible, serves to define and maintain the authenticity and architectural integrity of the structure. In conclusion, adaptive reuse should be carried out with utmost respect for the building's historical context and its surroundings. According to [6] (Figure 4) key problem areas in adaptive reuse this concept involves a transformative process that goes beyond mere preservation, delving into the interplay between cultural and architectural aspects. Let's break down the sublimation process into two key dimensions: Cultural Aspects and Architectural Aspects:

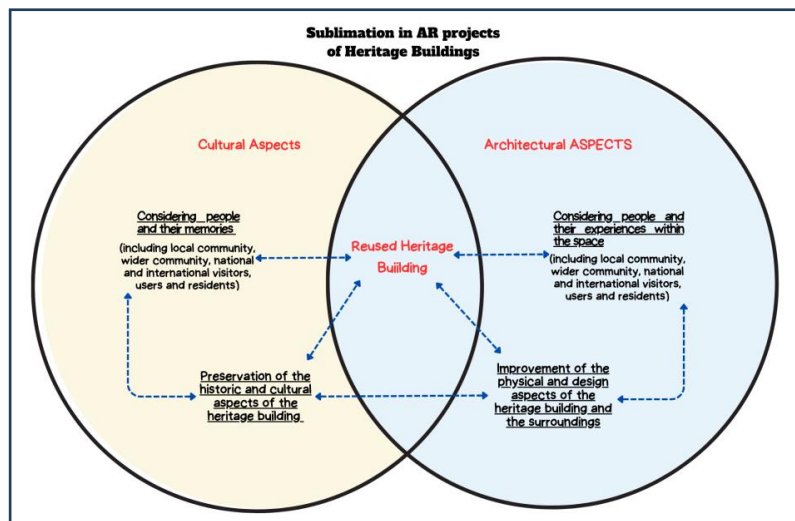


Figure 4 Bilateral relationship of cultural and architectural integrity

Source: internet then modified by Author

Cultural Aspects

Considering People and Their Memories: when we're reusing an old/heritage building, it's important to think about the memories people have with it. This includes locals, people from nearby and far away, and those who will use the building. It's better to consider making sure everyone's memories are respected and included in the changes to be made for instance the atmosphere of Javanese style in Kotagede captivating blend of cultural richness and historical significance for instance during important cultural or religious ceremonies, the open space of the pendopo becomes the focal point for rituals and gatherings, It's a part of the Javanese style that everyone would want to relive again.

Atmosphere: Besides keeping the building looking old, we also want to keep the stories and traditions it holds. This means making sure we protect the special history and culture tied to the building. It's not just about how it looks but also about keeping the meaningful parts alive for example how Kotagede maintains a strong sense of community, with locals often engaged in traditional ceremonies, communal activities, and cultural events. This communal spirit enhances the Javanese atmosphere; the meaning of the term "Javanese atmosphere" likely refers to the cultural and environmental characteristics associated with the island of Java in Indonesia from traditions, arts, and the way of life of the Javanese people to be quantified by looking at specific cultural markers. For instance, we could measure the prevalence of traditional Javanese customs, art forms, language usage, or architectural styles. And that's the case of Javanese houses they are not just dwellings to be living in but also where to create an environment where traditions are not just preserved but actively celebrated.

Architectural Aspects

Considering People and Their Experiences within the Space: we should think about how people feel and what they do in the building. This goes for locals, visitors, and anyone who uses the space. By understanding what people need and like, we can make the building work well for everyone.

Improvement of Physical and Design Aspects: While we're keeping the old parts, we also want to make the building better. This means fixing it up and adding things that make it more useful and nice to look at. We're trying to make it a mix of the old and the new so that it stays important and works well for today for example in Kotagede keeping elements like intricate carvings, wooden structures, and a harmonious blend of indoor and outdoor spaces but changing the function or the layout of some rooms in the heritage building but still not altering or destroying any wall or making huge architectural change from the original state.

In simple terms, when we're reusing an old building, we're not just keeping it the same. We're thinking about the memories people have with it and making sure its history is still important. We're also making it better so that it's useful and looks good for the people who use it now. It's like keeping the best parts of the past while making it work well for today.

3.2 Discussion

According to [6] elements of integrity are important in making a study about any adaptive reuse building that's why in this study we are trying to fill the lack of this area making a comparison between the 2 buildings: Omah UGM and Restoran Lumbung Mataram based on the parameter of the elements of building integrity, particularly architectural and cultural integrity, but also estimate the adaptation scale of and break it down into what changed and what has been kept the same

3.2.1 Architecture integrity of Omah UGM

Historical view



Figure 5 (a) Omah UGM damaged caused by 2006 earthquake (b) Omah UGM recently

Omah UGM was founded in 1860 with an area of 900 m before it was called Omah UGM. This Joglo house belonged to the Parto Darsono family, located in Bodon Village, Jagalan, Kota Gede, Yogyakarta. In the past, the owner of the Joglo house, which is now called Omah UGM, was a batik entrepreneur at that time, but over time the batik making activities at the Joglo house faded. On May 2006, an earthquake hit Yogyakarta, several parts of the Joglo house belonging to the Parto Darsono family were destroyed, especially the gandhok which was to the east of the Joglo house (Figure 5). Then, after the earthquake, the Joglo house changed hands to Gadjah Mada University (UGM), because inherited by their cousin (architecture lecturer at UGM), UGM took the opportunity and purchased the Omah UGM to make it a heritage destination. Now the Joglo house belongs to the Faculty of Architecture and Planning, and is named Omah UGM.

Considering People and Their Experiences within the Space

The place was repurposed to a museum due to the exigence of UGM and the only times that is used to another function like for lectures or organizing events It's usually under the request of the architectural department. The approach of repurposing Omah UGM into museum is based on the intention of giving a cultural value to the building especially that the owner is UGM an educational side that want to use it for academic purposes like a study center, in contrary with the reflection of an ordinary person that could use it definitely for other functions like a home stay or café (Figure 6).

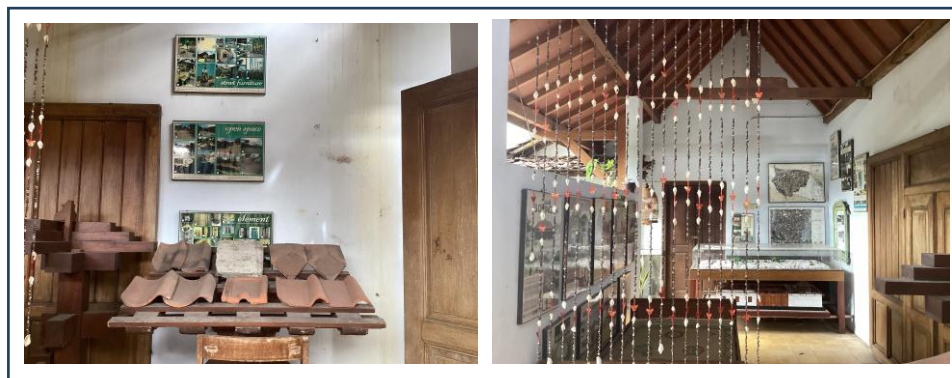


Figure 6 Omah UGM exhibition areas
Source: Personal Documentation

To deepening the understanding of the adaptive reuse on Omah UGM we need to analyze the change that has happened after being owned by Gajah Mada University (Figure7). BPKCB stands for the Kotagede Cultural

Heritage Area Management Agency, according to Mr. Erwito, the Joglo house, which is now called Omah UGM, had been almost neglected for a long time from 1900 to 1975. And the front porch was sold to become a yard and some of the furnishings of the Javanese house layout were lost. Before the 2016 earthquake began in 1999, many heritage observers outside Kotagede stepped in and collaborated with local people and local NGOs to create a movement to save traditional houses in the environment and area. Then after the earthquake, Gajah Mada University bought the house. That's explains (Figure 7) the part in green which is Pendopo its reconstruction was funded by JICA, the area in purple which is (Emper, Ndalem, Senthong Tengah, Senthong kulon, Senthong wetan and last gandok Kulon) was reconstructed by Total Indonesia, the part in light yellow which is (Gandok Wetan and Gandok Samping Pendopo) was funded by Exxon Mobil and last the Yellow area which is the additional part that was back then Pekiwan was funded by other contributors. This whole changes has made the new owner which is Gajah Mada University to give a value to the contribution of this community in the state of Omah UGM and makes the function to be Center for Heritage Movement, Gadjah Mada University.

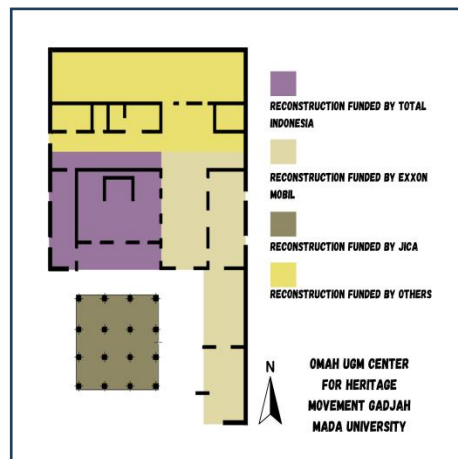


Figure 7 BPKCB contributors and which area funded by them
Source: Personal Documentation

Before Gajah Mada University bought the Joglo house, maintenance was only carried out patchily, not totally, because the owner was experiencing a tremendous economic downturn. Gajah Mada University wants to have a center for vernacular architecture, namely in Kotagede. Omah UGM was purchased as a conservation pilot as well as a center for studying vernacular architecture in its natural habitat. That explains the change of function in total to a museum and center of learning and the same way; the function of the spaces itself has had a change. Starting from the pendapa which had been destroyed and rebuilt again, according to Javanese perspective It's a front pavilion and serves as the main area for receiving guests and conducting formal ceremonies so even till today It's still an open space with a raised platform and decorated with intricate carvings that for nowadays the community still use it for doing Aerobic or if UGM allowed community events; however It's important to mention that the Pendopo in Omah UGM actually was not original from this place as it was bought from a place few kilometers away from Kotagede after the damage happened caused by the earthquake. Moving to the Gandhok in the east or the one called (Gandok Samping Pendopo) that was also rebuilt while preserving the former walls which were no longer intact for the old function It was to store valuable possessions, ceremonial items, and other important objects used in formal ceremonies and events held in the pendopo, for nowadays It's use as in (Figure 6) to exhibit the earthquake damage on Kotagede and the transformation that happened to the area with a small part in the front (Figure 9) that still under reconstruction till today.

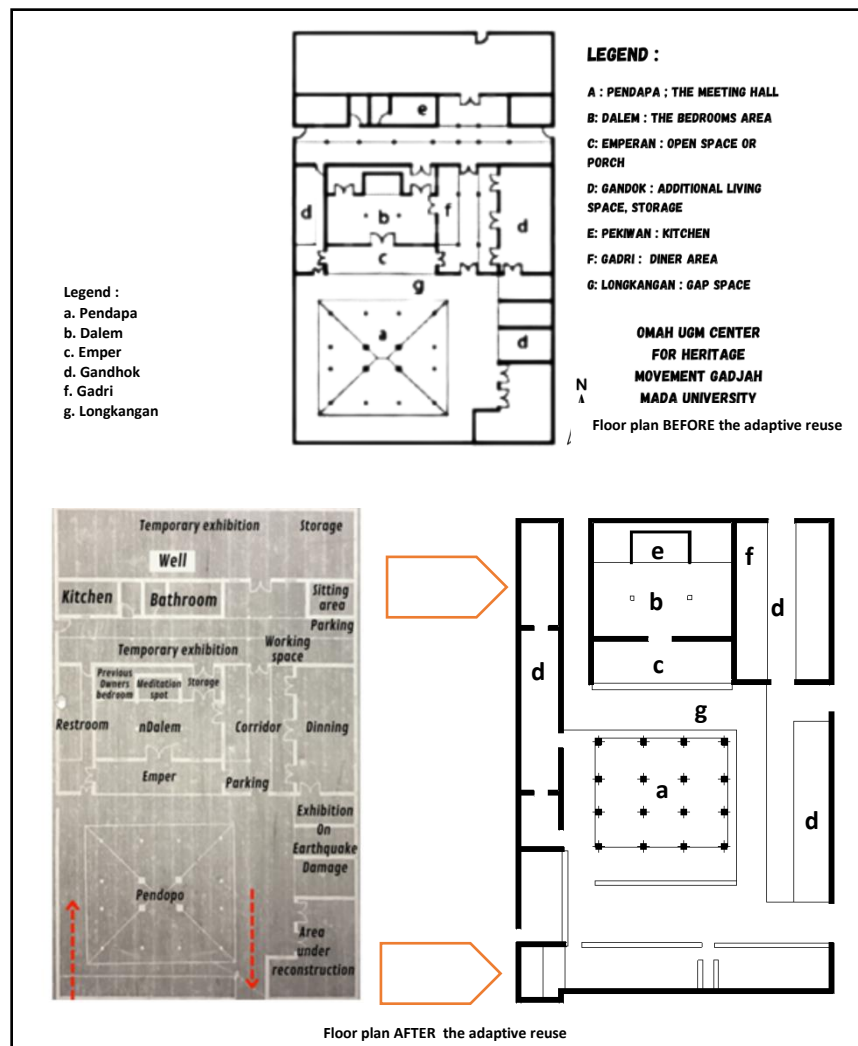


Figure 8 Omah UGM floor plan Before and After the adaptive reuse
Source: Modified from the site

Improvement of Physical and Design Aspects

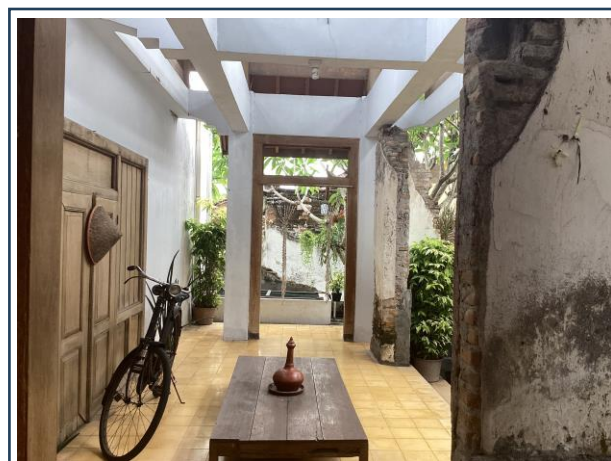


Figure 9 Gandok Samping Pendopo under reconstr Senthong kulon, Senthong wetan uction
Source: Personal Documentation

Next the (Dining, Ndalem, Senthong Tengah and Emper) are still the same with the only changes is that the area is public and the visitors can see by themselves every room stated. For the private areas that now they still has the same function as the past but just the visitors aren't allowed to check by themselves or take

pictures to are: Senthong kulon and Senthong wetan because one is a storage for weapons and the other one is the old room of the owners before they died. Moving to Gadri or what we can call in the new function a dining because there is no difference between It's old function and the new one, the only change is in the entrance of that corridor where there's a spot used as parking for motorcycles (Figure 10).



Figure 10 Gandok Samping Pendopo under reconstr Senthong kulon, Senthong wetan uction
Source: Personal Documentation

For the last part which Pikiwan, the old area has been completely destroyed like the kitchen but then rebuilt the same as It was (Figure 11); for this area It hasn't experience a change of function because the bathroom and the well connecting even the past way of getting water from a well and other infrastructure; that stayed the same, the kitchen stayed also the same and the sitting area and also the working space but with more precise names for each function as the floor plan in (Figure 8) explained. There's also another corner that used to be a corridor but for now the person in charge made it a rest space for her and also she decorated it with documentations of Omah UGM and furnishers from the previous owners that as she said no one is allowed to use it but they are object of contemplation by the visitors.

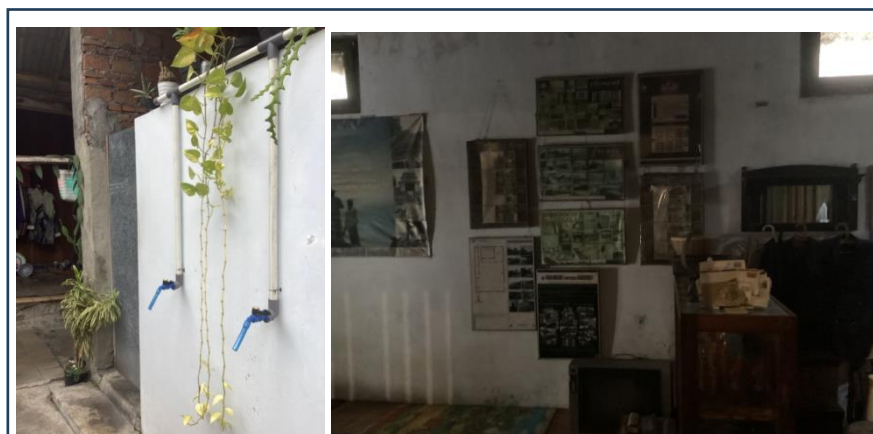


Figure 11 Omah UGM (a) bathroom, (b) the corridor changed to room
Source: Personal Documentation

3.2.2 Architecture integrity of Restoran Lumbung Mataram

Historical view

Owned by the ancestors of current owner that they aren't Indonesian but from Tiongkok China the exact date isn't precise but It's already the 5th generation that this house exist so I was built around 1500 – 1523

(Figure 12). They came to spread Islam religion in Indonesia especially Kotagede and they became part of Mataram kingdom his grandfather as minister in that era who got married to one of the princes of the kingdom. Mataram was a prominent kingdom on Java that existed from the late 16th century until the 18th century, when Dutch influence began to dominate Indonesia. Following the death of Sultan Agung in 1645, his successor proved to be weak and harsh, eventually negotiating a treaty with the Dutch that facilitated their colonization of the archipelago. In 1755, Mataram was divided as a consequence of the Third Javanese War of Succession, an event known in Javanese as 'Palihan Nagari'.

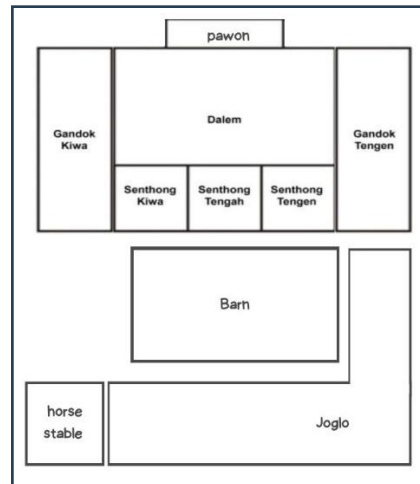


Figure 12 floor plan starting from 1500
Source: Modified from the site

Considering People and Their Experiences within the Space

The Restaurant Lumbung Mataram, was before a traditional Javanese house that his changement was processed through the years like this (Figure 13); when the ancestors start living with Kotagede community, they start doing buisness inside the Javanese house calling it house industry (West house), they start with producing traditional textiles for clothes, then they produced kitchen tools from copper that they still have some pieces of it, then later on around the independence of Indonesia on 18 June 1946 , they start producing Batik. The living area was around the private house areas and the production area was only limited in the Joglo part, then the new building was Built in 1750 (East house). In 2020 the adaptive reuse of this Javanese house into a retaurant started, this change that's happening little by little started with the change of the room's functions and minimal adhesion in spatial organisation by changing placement of the bathroom and the abandon of what was horse stables with intention to change it in the future.



Figure 13 Floor plan BEFORE and AFTER adaptive reuse

Source: Modified from the site

The adaptive reuse approach idea (Figure 14) came from the owner, he was struggling financially and needed to make a new income that's why he decided to change the house to a restaurant with minimalizing the change's costs; first the horse stable that used to symbolize the wealth of a Javanese house has been changed to a platform due to the shift away from horses as a primary mode of transportation that happened mainly because of the rise of automobiles in the late 19th and early 20th centuries. The bathroom placement that becomes a platform for the aesthetic of the restaurant, for the owner It's not a good idea that the costomer when entering the first thing to see is the bathroom due to its placement in the center so It was moved to the Joglo (West house) area. The Gandok Kiwa (West house) and Gandok Tengen (East house) now is combined in which we can see both roofs meet and changed in function into Mushallah and that's because primally as storage room and in Lumbung Mataram case the need for space to go to kitchen in the back and also the need for more space for other activities beside storing that is still there, they add a Mushallah and opened both Gandok without separation wall. The private rooms and areas like Gandok Tengen (West house), Gandok Kiwa (East house), Senthong, Dalem and Pawon are still the same with either the function and the previous furnishings because the owner still want the restaurant to keep the heritage of his ancestors. And last for the barn, Joglo are used as sitting areas for the restaurant with keeping the same

old atmosphere by the furnishings and keeping the old material and structural elements.



Figure 14 Joglo and current bathroom area

Source: Personal Documentation

Improvement of Physical and Design Aspects

The restaurant owner's plan for adaptive reuse goes beyond changing the function of the building. In addition to repurposing the space as a restaurant, the owner intends to create a sitting area on the platform identical to the sitting area created in front of the entrance and to transform the horse stable into an exhibition corner to showcase the memory of his family and ancestors who made a significant impact in Kotagede (Figure 15). This approach to adaptive reuse not only preserves the historical significance of the building but also adds a new layer of cultural and personal meaning to the space.



Figure 15 (a) sitting area in the entrance, (b) the platform that will transform into sitting area

Source: Personal Documentation

Improving the design aspect is crucial for adaptive reuse, especially when transforming a traditional house into a functional space like a restaurant while preserving its history and identity. Adaptive reuse projects require a creative approach to design, as they present unique challenges different from those of new construction. The process of adaptive reuse offers surprises and prompts questions that need to be addressed creatively, such as how to connect the new elements with the old and highlight unexpected features of the existing structure. Another thing is the platform in the place of the old bathroom; to be changed in the future to a sitting area. It shows the deep understanding and thoughtfulness of the owner by making a good use of the whole space.

Finally, this is the comparison on the aspects changed according to Douglas's (2006) considering architectural integrity in both Omah UGM and Restoran Lumbung Mataram (Table 1).

Table 1 Comparison of architectural integrity of Omah UGM and Restoran Lumbung Mataram

Evaluation Of The Adaptation			
Architectural Integrity	Aspects	Omah UGM	Restoran Lumbung Mataram
Considering People and Their Experiences within the Space	Change of Building function	✓	✓
	Improviung the quality	-	✓
Improvement of Physical and Design Aspects	Repainting	✓	✓
	Replacements	✓	✓
	New openings	-	✓
	Re flooring	-	✓
	Re roofing	-	-

Source: Personal Documentation based on findings

3.3.1 Cultural integrity of Omah UGM

Considering People and Their Memories

The cultural aspect make in consideration the people and their memory with the place and also the symbolic meanings of architectural elements, from the direct survey, the columns of the Pendopo or Pendapa (Figure 16) are simple when It comes to the decoration and the size It might be more bigger than other columns of a Joglo but also there's more columns than Its usual state, because the original pendapa building has been sold, Gajah Mada University bought a Pendapa from Panggang village, Gunung Kidul so we can see 4 pillars with large dimensions, namely 20 cm brought from somewhere a few away from Kotagede. The typical column size in Kotagede ranges from 17 to 18 cm, adhering to a standard wooden structure. This structure is composed of wooden beams and columns, with the fundamental design centered around a solid wooden framework. This framework is created by connecting four columns (saka guru) with double beams, specifically the blandarpamidhangan (blandarpamidhangan panyelak and blandar pamidhangan pamanjang) and sunduk (sunduk panyelak and sunduk pamanjang). The stability of the structure relies heavily on these joints. For example, the primary framework of a joglo consists of an open arrangement of sakas (columns) and blandars (beams), including blandarpamidhangan panyelak, blandar pamidhangan pamanjang, sunduk panyelak, and sunduk pamanjang. The original design was closely followed, and the slight variation in size did not significantly impact the structural integrity.



Figure 16 Omah UGM pendapa

Source: Personal Documentation

For the symbolic of decoration of the structure; the symbol of the timber blinders used in a Javanese house, specifically in a Joglo (Figure 17), is a specially-shaped wooden peg that is used to connect each layer of blandars. This arrangement of blandars is more likely to satisfy architectural purposes rather than structural

necessity. The use of wooden pegs to reinforce the joints is a traditional technique that has been used for centuries in Javanese architecture. The pegs not only provide structural support but also add to the aesthetic appeal of the building. The use of traditional techniques and materials in the construction of a joglo is an important aspect of preserving the cultural and historical significance of the building. The joglo is a symbol of Javanese architecture and culture, and the use of traditional techniques and materials helps to maintain this identity.

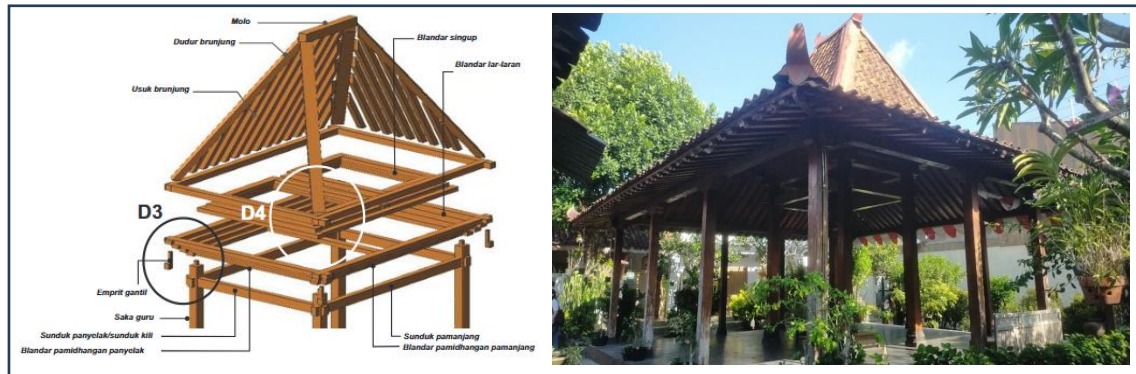


Figure 17 Joglo structure, Omah UGM Joglo structural elements

Source: <https://unesdoc.unesco.org/ark:/48223/pf0000180608>

Also another side that can be related to features like doors and windows colors; the color of the doors and windows at Omah UGM is green (Figure 18), which doesn't mean they are of royal descent. However, it is a form of public admiration for the colors used by the palace, because only the palace has a good reference. Not all houses in Kotagede are included in cultural heritage, especially Omah UGM. But after 2010 there was some decision from the government regarding the cultural and identity of areas like Kotagede, now a new regulation has emerged, the owner of the proposed house must have an important meaning for cultural knowledge, it could be the house of a movement figure, a craftsman figure, an arts and culture figure.



Figure 18 Omah UGM doors and windows

Source: Personal Documentation

However, according to the Homeowner's Conservation Manual for the Kotagede heritage district in Yogyakarta, Indonesia, it is advised that doors, windows, and ventilation openings be constructed from plain, unpainted timber. A varnish or natural-colored paint finish is also acceptable for weatherproofing purposes. If materials other than timber, such as aluminum, are used, they should be painted in natural wood colors to maintain the district's character. The choice of wood for these elements, along with the use of natural hues, preserves the symbolic significance for the community, even when adaptive reuse approaches are implemented.

3.3.2 Cultural integrity of Restoran Lumbung Mataram

Considering People and Their Memories

From the first glance we can notice the damaged wood in the Joglo structure (Figure 19), the material looks old and even the lamp as the owner said they only use the furnishings from the construction when it was a Javanese house; the symbolic of keeping the material and everything we can still preserve is for showing the identity even if the owner still have future dimensions for the other areas but for the Joglo he consider it a heritage as long as it still serve as a shelter we still can keep it. Other symbolic dimensions for this preservation it can create a sense of nostalgia and familiarity for users, as they are able to connect with the history and memories associated with the building. This can lead to a more meaningful experience for visitors and customers, which can contribute to the success of the restaurant. And last, it can be more sustainable and cost-effective to reuse existing materials and infrastructure rather than building from scratch, which is beneficial for the environment and the economy.



Figure 19 Restoran Lumbung Mataram Joglo structure
Source: Personal Documentation

Another aspect which is keeping the old material that didn't change since 1750 except for the repainting during the adaptation in the last 3 years. By keeping the old material, the unique character and history of the building can be maintained, contributing to the cultural identity of the community. Adaptive reuse is a conscious decision to preserve the past while planning for the future, allowing old, abandoned, or historic structures to be repurposed and given new life. There's the creativity also in using old window frames as decoration in order to recycle these frames and they gave an interesting aspect meanwhile keeping the adaptation reuse approach that is in Restoran Lumbung Mataram circounded on minimizing the costs of turning this building into a restaurant and to make it reveal the history of the owner's family and ancestors (Figure 20).



Figure 20 Restoran Lumbung Mataram sitting area
Source: Personal Documentation

Another aspect that translate this core memory of the users, It's related to the functionality; Kopi Lumbung Mataram was previously a coppersmith workshop and since 6 decenies this sitting area nowadays was used as a side buisness like Batik and copper depending on the owner's craftmanship and the people that worked for him; then nowadays the change into a restaurant triggering the visitors memories and the house identity also has that aspect of keeping the old machines in the Mushulah area and keeping some of the furnishing they made the ancictors to use it for the decoration of the restaurant so no need for outside architectural elements or decorations and that's how the building preserve its cultural identity throught the change that happened from the creation of the first building till the whole restaurant Lumbung Mataram combined.

Finally, this is the comparaisn on the aspects changed according to Douglas (2006) considering cultural integrity in both Omah UGM and Restoran Lumbung Mataram;

Table 2 Comparaisn of cultural integrity of Omah UGM and Restoran Lumbung Mataram

Evaluation Of The Adaptation			
Cultural Integrity	Aspects	Omah UGM	Restoran Lumbung Mataram
Considering People and Their Memories	Symbolic ornement	-	-
	Old activities	✓	✓
Atmosphere	The building style	-	-
	Preservation of nostalgia	-	-

Source: Personal Documentation based on findings

4-5. Degree of adaptation

Table 3 The degree of change based on cultural and architectural integrity

	Cultural integrity		Architecture integrity		The degree of change
	Omah UGM	Restaurant Lumbung Mataram	Omah UGM	Restaurant Lumbung Mataram	
Tangible Aspect	-Symbolic ornement: blander and Jogo's columns - Javanese style	-Symbolic ornement: using windows as ornaments - Javanese style	-Adaptive reuse made by the community, It respects the identity of Kotagede and act as cummunity center. - The change of some aspects like function of some rooms but overall keeping the previous furnishings and atmosphere -Kept the	- The adaptation to a restaurant still respect the old function of the house and its identity as Javanese house in Kotagede - The change of some aspects like placement of some rooms for the overall aesthetic of the restaurant	Midium scale of change due to the tangible aspects that was altered but It has justifications and all make just the constructions adapted to the new function

	Cultural integrity		Architecture integrity		The degree of change
	Omah UGM	Restaurant Lumbung Mataram	Omah UGM	Restaurant Lumbung Mataram	
			wood and the exact material from before the adaptation	-Kept the wood and the exact material from before the adaptation	
Intangible Aspect	-Changed from a dwelling for family to live into a museum showing the house identity - The house make the visitors have nostalgia for the old style of building	-Changed from a dwelling for family to live in in with some side buisness like Batik into a restaurant triggering the visitors memories and the house identity - The house make the visitors have nostalgia for the old style of building	- The visitors come to experience the struggle and damage that caused the earthquake on Kotagede and its building while Kotagede kept its identity	-The visitors come to experience a good meal and food experience with the nostalgia and memories made by the space.	Low scale of change due to the intangible aspects respected
Source: Personal Documentation based on findings					

The adaptive reuse of both buildings involved a similar degree of change, with a low scale of change due to the intangible aspects respected and a medium scale of change in the tangible aspects. The adaptive reuse process respected one hundred percent of the cultural integrity of the buildings, as small changes were made to the architectural elements to improve aesthetics or spatial arrangements as the table above explain. These changes were necessary to adapt the buildings to their new functions, ensuring that the spaces were functional and economically viable while preserving their cultural significance. The adaptive reuse approach allowed for the reuse of existing structures, which is a cost-effective alternative to demolition and new construction . By respecting the cultural integrity of the buildings, the adaptive reuse process contributed to the preservation of valuable cultural and historical resources, ensuring that these buildings continue to serve a purpose in the modern world.

4. Conclusion

The process of adaptive reuse requires a delicate balance between preservation and functional transformation espically in the case of old houses like Javanese house in Yogyakarta. The paramount consideration should be the preservation of the fundamental aspects that define the integrity of the architectural and cultural elements. While accommodating additional elements like bathrooms may be more flexible in terms of placement, altering the essential features, such as removing walls, can jeopardize the inherent integration of

the space. A cautionary example is the case of a pendopo in Kotagede near Omah UGM, where the introduction of a new Joglo altered the overall appearance and essence of the structure. This emphasizes the importance of maintaining the original character and architectural identity during adaptive reuse projects.

Furthermore, whether the transformation is for commercial or non-commercial purposes, the challenge lies in strategically placing new elements without compromising the integrity of the original design. For instance, converting a pendopo into a café requires careful consideration, as adding chairs may be a minor change, but incorporating a kitchen and other installations can result in a more major transformation and alter the integrity of that adaptive reuse.

Therefore, it is crucial for owners and experts engaged in adaptive reuse to be mindful of the decisions they make. They should prioritize preserving the essential elements that make the architecture culturally significant, ensuring that the adaptation remains integrated and respectful of its heritage. Recommendations for future endeavors include thorough research, consultation with cultural experts, and a thoughtful approach to strike a harmonious balance between preservation and adaptation. And for the government and community to promote community engagement, offer financial incentives, establish clear guidelines, collaborate with heritage conservation organizations, and support research and education can help encourage adaptive reuse in old houses.

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6. Conflict of Interest

The authors whose names are listed below certify that the manuscript does not have a conflict of interest.
Rania Ababssi

This statement is signed by all the authors to indicate agreement that the above information is true and correct:

Author's name (typed)

Author's signature

Rania Ababssi



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