

RECONCILING BUILDING CHARACTERISTICS IN ADAPTIVE REUSE

Adapting a garage an a pendopo into a Café

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ABSTRACT: Adaptive reuse gains importance considerably in current times as this strategy has ecological, economical and socio-cultural benefits especially related to attempts in urban renewal. In adapting a building into commercial services, it is advisable to consider the preferences and the behavior of the customers to ensure the success of the business. The author participate in the adaptation of a mundane garage and an elegant Javanese traditional buildings into a café and eating place serving university students. Employing research by design method, this research aims to understand the strategies applied in reconciling these two very different buildings into one integrated facility. The result is by understanding the characteristics of the buildings and the behavior of the customers these two different buildings may play distinctive roles yet integrated into one service with coherent atmosphere.

Keywords: adaptive reuse, café, industrial building, integration, traditional building

INTRODUCTION

Considering rapid urbanization, environmental concerns, and a growing appreciation for cultural heritage, adaptive reuse has emerged as a preferable tool in reimagining the built environment, rather than simply adding new buildings and infrastructure to fulfil contemporary needs. By repurposing existing structures for contemporary needs, adaptive reuse bridges the past and the future. This strategy provide solutions to ecological, economic, and cultural challenges.

Adaptive reuse fully aligns with the principles of sustainability. The demolition of buildings generates great amount of waste. On global scale, construction and demolition activities contribute to nearly 40% of all waste (Ghosh, 2020). By retaining parts of existing structures, adaptive reuse also reduces the need for new materials and therefore considerably lowers the carbon footprint associated with construction.

As climate change and its effects become increasingly conspicuous worldwide, the adaptive reuse of existing architecture emerges as more sustainable than the demolition of old buildings and the construction of new ones. (Münster, 2024). By repurposing existing structures, adaptive reuse reduces waste, conserves materials, and helps mitigate the adverse effects of climate change.

“Adaptive reuse is the ultimate form of recycling” (Langston, 2012) as it extends the lifecycle of buildings while mitigating environmental degradation. It enhance the circular economy model, by continuously repurposing a structure rather than demolishing. Wong (2016) states that adaptive reuse is essentially applied since time immemorial, as it is rooted in the human resourcefulness. For instance, a prehistoric cave was used as dwelling, storage, shrine as well as burial place interchangeably.

There are great varieties of building types, sizes and scales to adapt in great spectrum of use to suit contemporary needs. A simple wooden barn can be repurposed into a comfortable house, a serviceable office, a distinctive exhibition space, a cozy restaurant and many other types of functions to accommodate.

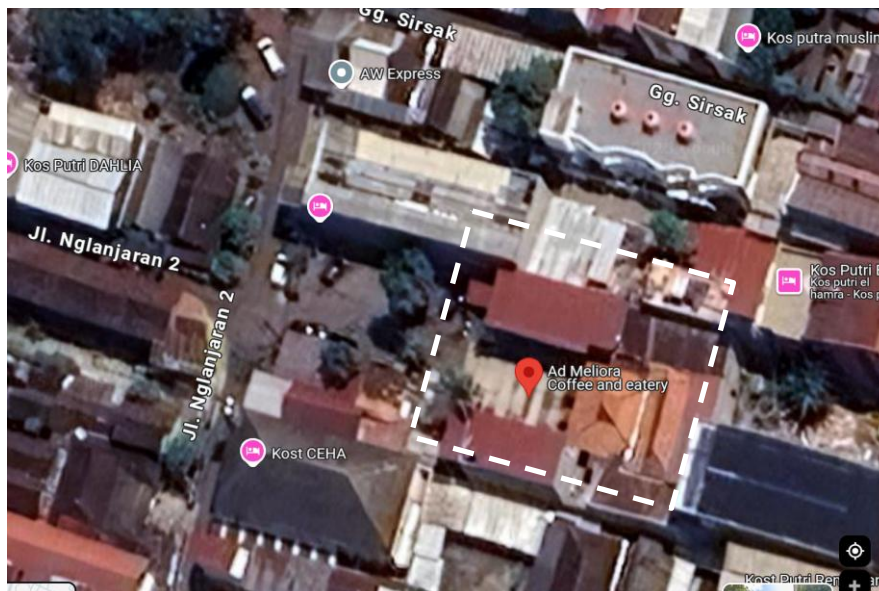
In adapting an old building stock, there are a number of necessary steps:

a. to observe and identify the characteristics and conditions of the existing building,

- b. to determine the viable use of the building in the future,
- c. to plan for alternative strategies in adapting the building,
- d. to implement the plan in building construction, conservation and refurbishment,
- e. to use the adapted building into new functions and purposes, and
- f. to evaluate the result of the adaptation.

Recently, the author had a chance to participate in the adaptation of two buildings on one site for a new purpose in 2023-2024 in a design-built project as assistant architect and construction supervisor. This paper aims to reflect the experience in the project and derive lessons from the process.

This project is relatively simple in technical terms yet is quite challenging in architectural terms. Two under used buildings next one another are adapted into a café. These buildings have very different physical characteristics and aesthetic styles. Both are united in the new functions. One building is a classical style Javanese pendopo with many pillars and steep clay tile roof. The other building is a two storey utilitarian structure with corrugated metal roof. The lower floor serves as a garage and the upper floor is for sitting and relaxing.



Picture 1. The Buildings to adapt and their surroundings
Source: GoogleEarth image, January 2025

LITERATURE REVIEW

In the quest for sustainability, adaptive reuse has emerged as a powerful alternative to demolition and new construction. By breathing new life into old buildings, cities can reduce waste, preserve architectural heritage, and extend the lifespan of structures that might otherwise be lost. Yet, despite its many advantages, adaptive reuse comes with its own set of sustainability challenges. From balancing embodied carbon with operational efficiency to ensuring resilience against climate change, the process demands thoughtful solutions that merge historical integrity with modern sustainability standards.

One of the strongest arguments for adaptive reuse is the preservation of **embodied carbon**—the energy and emissions embedded in building materials like brick, concrete, and steel. Every time a building is demolished, these resources are lost, and constructing a new one requires massive amounts of raw materials and energy. According to Giesekam et al. (2016),

While adaptive reuse prevents demolition waste, the process still generates significant construction debris. Many older buildings contain hazardous materials such as lead-based

paint, asbestos, and outdated wiring, all of which require careful removal and disposal. In some cases, walls must be reinforced, foundations strengthened, or roofs replaced, leading to considerable waste generation—a factor often overlooked in sustainability discussions.

From an economic standpoint, adaptive reuse can be a catalyst for urban renewal. Older buildings often occupy prime locations, and their reuse can stimulate investment in neglected areas. According to Bullen and Love (2011), adaptive reuse projects are often more cost-effective than demolishing and rebuilding from scratch, as they require fewer raw materials and less labor-intensive construction. Moreover, they generate employment in specialized restoration trades, urban planning, and creative industries.

Beyond economic and environmental benefits, adaptive reuse plays a crucial role in preserving cultural identity. In many cities, historical buildings are markers of collective memory, embodying architectural traditions and historical narratives. The loss of such structures can lead to cultural erasure. As Lynch (1960) famously argued in *The Image of the City*, a city's identity is deeply intertwined with its built environment.

Far from being merely an act of conservation, adaptive reuse is also an avenue for architectural innovation. The juxtaposition of old and new materials, the challenge of integrating contemporary functionality within historic forms, and the necessity of creative problem-solving make these projects unique. Architects often see constraints as opportunities—wherein the limitations of existing structures inspire innovative design solutions.

For instance, the Zeitz Museum of Contemporary Art Africa (MOCAA) in Cape Town transformed a century-old grain silo into a striking art space. Designed by Thomas Heatherwick, the project carved out cylindrical spaces within the thick concrete walls, creating an entirely new spatial experience while preserving the original industrial character (McGuigan, 2017).

Similarly, co-working spaces and boutique hotels repurposed from old warehouses in cities like Berlin and Shanghai exemplify how adaptive reuse caters to contemporary lifestyles while maintaining architectural heritage. Such projects blur the boundaries between the past and the present, demonstrating that innovation need not come at the cost of history.

In a world increasingly aware of the need for sustainable development, adaptive reuse stands as a testament to human ingenuity—proving that buildings, much like societies, can evolve without erasing their past. By preserving history, reducing environmental impact, and revitalizing urban spaces, adaptive reuse offers a blueprint for the future of architecture and urban planning. As Bullen & Love (2011) aptly put it, “the most sustainable building is one that has already been built.”

Through its blend of environmental responsibility, economic pragmatism, cultural sensitivity, and creative reinvention, adaptive reuse is not merely an architectural trend but an essential strategy for the contemporary world. It encourages us to look at our surroundings with fresh eyes, seeing potential where others see obsolescence—and in doing so, it crafts a legacy for generations to come.

RESEARCH METHOD

As the author participates in the design of this adaptation, this research employs research by design method. “Research by design is a type of academic investigation through which design is explored as a method of inquiry, by the development of a project and also exploring the different materials by which a design is carried out—sketches, mapping, among others” (Roggema, 2017)

In determining the future use of a building, Kincaid (2002) suggests some consideration, namely:

- a. The supply characteristics: the set of physical opportunities and constraints of the building, its location, site, facilities and support services.
- b. The demand characteristics: the set of use requirements by function and specific type of use, describing the demand-led needs of user and organisation.
- c. The performance requirements: the interface between supply and demand, matching the set of physical provisions with the set of operational requirements.

The decision procedures: the means by which the use viability, physical viability and financial viability of alternative options for change may be assessed.

RESULT AND DISCUSSION

Following step-by-step actions in adaptive reuse, the process can be described as follows:

- a. to observe and identify the characteristics and conditions of the existing building and surroundings

The site of these two building is situated on Nglanjaran 2 road some 130 meters away from UII Campus. With this proximity to the Campus it is very reasonable to conceive the future use of these building is to serve students' needs living around, as many buildings in the vicinity are functioned as boarding house of UII students.

One building is a pendopo facing west to Nglanjaran 2 road. This building has two layers of roof and supported by 16 timber pillars with floor measuring 8 by 10 meter. This pendopo has elegant wooden structures to expose including rafters supporting all roof areas and piles of beams supported by four main pillars called tumpangsari in Javanese terms. This tall pillars and tumpangsari create a strong centerpiece unifying the entire space. With only wooden panel wall at the rear side, the pendopo space is open to the front and on both sides.

The other building is a two storey structure with footprint of 5 by 10 meter. Three sides of both floors are covered with brick walls. Long side facing the yard are covered with glass on the upper floor and with rolling doors on the lower floor. A quite steep stair is placed on the rear side of the building. This building is simple, plain and pragmatic with almost flat roof made of corrugated metal. The walls are plain with no articulation, and the lower floor is simply cemented.

There are two open space on the site. The first is an empty yard measuring about 10x15 meter covered with conblock adjacent to the two buildings. Another open space is placed in between the buildings and the road. This open space is larger than the first with few big trees grow in the middle.

- b. to determine the viable use of the building in the future

With the location near the Campus, it is understandable that the owner would like to convert his property into a café with students as primarily the prospective customers. The choice of café seems very simple and conventional. However, the competition among cafés in current situations is very tight. Some innovations are necessary to propose in the way to serve customers affecting the design of building, interior and landscape.

The café is intended to serve customers continuously 24 hours a day and 7 days a week. This decision have some implications in the characteristics of activities and the types of services provided. Morning, noon, afternoon, evening and late night have different atmosphere and vibes which require certain design innovations.

- c. to plan for alternative strategies in adapting the building,

Most people come to a café with friends or to meet friends there. Some may only sip drink and refreshment for about half an hour, but many of them may spend hours in good

conversations, doing assignments or else. In developing the design to adapt existing buildings into café, the architect pay meticulous attentions how to serve different types of gatherings of the customers.

Each space has some particular characteristics. It is necessary to understand these characteristics in order to adapt these spaces into variety of rooms to serve different needs and behavior of the customers.

Table 1. Characteristics of the Existing Spaces

| | Sizes and proportion | Access and connection | Boundary and enclosure | Articulation and materiality |
|---------------------|-------------------------------|---------------------------------------------------|--------------------------------------------------|--------------------------------------------|
| Garage floor | Rectangular, wide and shallow | Direct access from the yard | Glass wall on front side, massive on three sides | Clean, geometric, industrial material |
| Garage floor | Rectangular, wide and shallow | Accessed from the lower floor | Doors on front side, massive on three sides | Clean, geometric, industrial material |
| Pendopo | Almost square | Direct access from the yard | Timber panel on rear side, open on three sides | Exposed natural wood, strong craftsmanship |
| Front yard | Rectangular | Direct access from the street, garage and pendopo | Pendopo and garage as boundary | Hard ground cover |

Source: author, 2025

Considering those characteristics, the spaces in this complex can be assigned for different types of customers and their behaviors. Generally speaking these customers tend to be differentiated according to the size of groupings and the seriousness of their activities. In terms of grouping, they may gathered in small scale group (2-4 people), medium scale group (5-8 people), large scale group (more than 8 people). The degree of seriousness can be differentiated into serious activities dominated by computer or paper works or organized meeting, semi-serious activities with more conversation among group members with informal and spontaneous topics to talk about. The less serious activities can be identified in convivial gatherings or events such as celebrating birthday or watching football match together, often with the joyful and noisy atmosphere.

With its narrow space and indirect access, the upper floor tend to accommodate more private or serious activities. This seriousness can be supported further by providing a meeting room for some organized gatherings. The lower floor with its direct access and connectivity to the front yard tend to invite people for more informal and less serious activities. However, due to its limited size, this part can only accommodate medium scale gatherings.

Pendopo is special since it is traditionally created for place of gathering accommodating substantial number of people. More than forty people may gather in variety of moods in this place. To enhance the intimate atmosphere of this place, some old-fashioned wooden and iron arm chairs are arranged as if this hall is fully functioned as ruang tamu or guest reception room in a Javanese house.

The front yard is very simple yet it plays distinctive roles. It serves as an entry point for customers from the parking area and also a hub to connect between two buildings. In certain convivial occasions it even becomes the center as in large scale watching football match on giant screen installed in this open space. In this configuration the gathering space is

extended to both buildings, while the upper floor may function as tribune to watch the game on the screen as well.

Table 2. Spatial allocation for each type of gathering

| | Serious activities | Semi-serious activities | Joyful event |
|---------------------|----------------------------|------------------------------------|-------------------------|
| Small scale | Upper floor working table | Upper floor | Lower floor and Pendopo |
| Medium scale | Upper floor lounge | Lower floor and upper floor lounge | Pendopo |
| Large scale | Upper floor (meeting room) | Pendopo | Pendopo and Yard |

Source: author, 2025

- a. to implement the plan in building construction, conservation and refurbishment, The plan is relatively simple to implement. Glass wall is installed on the lower ground replacing the rolling door and matching with the enclosure of the upper floor. The lower floor serve as a lobby and serving counter where customers may order food and beverages before they sit. Behind this corner is the kitchen to prepare all meals and drinks for the whole area.

The upper floor is divided into three parts. Near the stair a set of table, sofa and chairs are placed to accommodate more quiet yet intimate gatherings. Long working table with some chairs are placed on the front corner serving those who would like to work more seriously with laptops and other gadgets. While the rear corner is created as a meeting room with formal arrangement of furnitures and fully covered with glass walls to provide acoustic barrier but maintaining visual continuity. With the front part of the upper floor is fully glazed, the visual connectivity between the garage and pendopo continues.

The pendopo is already complete in itself. It only needs some seating and table to flexibly arranged for variety of groupings. If necessary, a portable screen can be installed at the rear wall behind the central space.

- b. to use and operate the adapted building into new functions and purposes
 The manager of the café operate the business while managing the space. As this facility is intended to be operated 24 hours a day, the manager have to ensure the security, cleanliness and serviceability of the premises. With all front portions of both buildings are open or transparent, the surveillance is easier to perform. The position of the kitchen at the junction of both buildings make the service is easier and faster.
- c. to evaluate the result of the adaptation
 It is necessary for the owner and manager to evaluate regularly the conditions of the buildings and the performance of the space ensuring the quality of the place, integrity of the structure and serviceability of the infrastructure.



Picture 2 The Lower floor of the former garage building (documentation of AdMeliora Café and Eatery, 2024)



Picture 3 The Upper floor of the former garage building
(documentation of AdMeliora Café and Eatery, 2024)



Picture 4 The Pendopo
(documentation of AdMeliora Café and Eatery, 2024)



Picture 5 The Pendopo, front yard and former garage
(documentation of AdMeliora Café and Eatery, 2024)

The possibility to turn functional areas into centers of sustainability and social interaction is demonstrated by the creative conversion of the garage into a coffee shop at Jl. Nglanjaran. The significance of user comfort in adaptive reuse projects, especially in areas serving particular user populations like college students, is a major lesson to be learned from this study. The results emphasize that user happiness and engagement with the place are significantly influenced by comfort, both psychologically and physically. In order to create a welcoming environment that meets the demands of users, features like ergonomic seating

configurations, appropriate lighting, sufficient ventilation, and areas for both solo and group activity are essential.

It is advised that the coffee shop include design features that put students' demands for leisure and productivity first in order to further improve the space's comfort and usefulness. The user experience can be improved, for instance, by including flora to create a peaceful atmosphere, offering dependable and fast internet connectivity, and providing materials that reduce noise to reduce distractions. In addition to facilitating extended visits, these design decisions help users feel like they belong.

In order to improve user comfort and environmental sustainability, future studies should examine how adaptive reuse of small-scale facilities, such as this coffee shop, may incorporate cutting-edge ergonomic concepts and sustainable building materials. Incorporating user input into the design process can also guarantee that the updated area will continue to adapt to changing community requirements, especially those of students who regularly utilize these areas for social and academic reasons. This strategy will emphasize how adaptive reuse supports socially conscious and sustainable urban development.

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