Continuity of tradition: Vernacularity of the modern Javanese house transformation in Laweyan, Surakarta

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Abstract. Javanese architecture has transformed from vernacular tradition to modern. The outward appearance of modern Javanese houses in Laweyan seems heavily influenced by European styles because they are more permanent and are considered less suitable for a tropical climate. However, these houses are the work of the Laweyan people which are based on the Javanese house principle of 'shelter' architecture and are in harmony with the climate. This study attempts to understand the philosophical basis of the Javanese people in building houses. The method used in this study is a qualitative case study that seeks to uncover the vernacular concepts shaping some modern Javanese houses in Laweyan. This research has identified several vernacular strategies in the development of modern Javanese homes i.e., 1) responding to the tropical climate by using traditional Javanese architecture; 2) applying up-to-date construction technology and materials; 3) recycling used materials and elements from the past to remember and honor ancestral heritage. This paper concludes that the vernacularity of the Laweyan house does not always conflict with tradition. It has even enriched traditional knowledge, namely the principle of memetri and has helped the Javanese people in realizing their ideal homes that still adhere to traditions.

1. Introduction
Changes have occurred in the ways places of residence are built, from primitive to vernacular, then to the industrial and modern vernacular [1]. In the primitive process, there were types of buildings and models available with few variations; these buildings were built by everyone. In the preindustrial vernacular process, there were more types of buildings and more varied individual models; these buildings were built by traders. Whereas in the modern process there are many types of special buildings and each building is an original creation; these buildings are designed and built by a team of specialists. This change clearly involves a process of determining the differentiation of types and spaces, the development process, and the involvement of the trade sector.

In certain societies, the process takes place traditionally by forming unbreakable bonds over the course of time and generations and can last until now. Changes in traditional architecture occur during an inheritance. During this process, the exchange of ideas transpires between people and between generations, individually or in groups, which occurs by incorporating past conditions. These are then issued in the form of ideas and architectural works that are applied locally and within a limited period.
The pressure and demands of progress and modernity will always change and transform traditional architecture (Figure 1).

The change over from the late19th century to the early 20th century was a transition period for the development of Javanese architecture into modern times, which could be seen as the end of Javanese architecture development before undergoing a transformation into western-based architecture [3]. This leads to the question to what extent western thinking influences Javanese architectural knowledge, and how did the Javanese apply this mixed knowledge in their architectural work? Knowledge and theories of architecture that have been developed until now have not been able to fully explain the process of transformation, especially in the development of Javanese vernacular architecture in the modern era.

![Figure 1. Vernacularity in maintaining the tradition of the modern house (Modified from Cahyono [9])](image)

2. Methods
Morphological analysis is used to trace the architectural work formation process of the modern Javanese houses in Laweyan. Morphology studies the architectural elements as well as the shape and the mass of the building. The emphasis is on the change in shape, either in part or in whole, including the causal factors and effects of the changing shape. Laweyan is an area in the city of Surakarta that developed from an old village that has existed even before the Kingdom of Pajang (17th Century) and the Surakarta Palace (18th Century). In this area, many groups of houses are occupied by the extended families of batik entrepreneurs which have been developed for generations. Some groups of houses are chosen as a case study (Figure 2).

This paper presents the case studies of Cokrosumarto family’s houses in Laweyan sub-district, Pusposumarto family’s houses in the sub-district of Bumi, and Harjodikoro family’s houses in Sondakan Sub-district. In-depth observations were conducted by photographing, filming, measuring, and redrawing of the houses. Interviews were also conducted with informants who are knowledgeable about the houses. The discussion focuses on the vernacularity of the process of the houses’ development.
3. Vernacularity of the Javanese architecture

Javanese people living in a house is likened to people sheltering under a large tree [3,4]. Sheltering is an attempt to avoid the sun and rain. Sheltering is not running away from the climate, but being in contact with it. This explanation also defines the tree as a shelter in the real sense, i.e., a place to shelter from climate influences. This means that the leaves function as an umbrella and play a very important role.

Meanwhile cultural or religion-wise, sheltering is seen as a temporary action, or a short stop on a journey. The Javanese proverb "wong urip kuwi saderma mampir ngombe" means that life is just a transit to drink (rest), while the goal of a Javanese’s life is happiness in the eternal hereafter. The house is a kind of temporary transit station [5]. The embodiment of a traditional Javanese house is its temporary nature, not permanent, with a knockdown wooden frame system [6].

Over time, many Javanese houses have changed because of the mindset of their owners who continuously wanted to build a better house. People’s cultural products will experience changes due to external and internal influences [7]. An example of external influence is cultural contact with migrants whereas internal influence is the change of social roles and status. Meanwhile, Javanese culture is characterized by the wish to always maintain its authenticity [8]. External influences that are suitable can be accepted only as enrichment.

**Figure 2.** The research objects are groups of houses of batik entrepreneurs’ families in Laweyan district, mainly at A: Laweyan Sub-district; B: Sondakan Sub-district; and C: Bumi Sub-district. [9]
Figure 3. (a) The shelter system of the Javanese traditional house; (b) Protection system against humidity, heat radiation and glare in modern homes [4]

The physical manifestations of traditional Javanese houses that are identifiable comprise spatial patterns and building masses; the shape of buildings; use of building materials; and design of ornaments. The hierarchy of spatial patterns with an enclosed courtyard fence consists of the main building (core) and the additional buildings that surround the main building. The fence here is understood as creating moral-ethical boundaries that still allow interaction with the wider outside world [8]. However, for the palace, the noble house and the entrepreneur’s house, the principle of the fence is turned into a high and massive wall like a fortress. Javanese thinking is in fact very influential and significant in the construction of modern architecture in Surakarta [9]. The conditions of the modern Javanese houses could be seen in the walled houses complex of the batik entrepreneurs at Kampung Laweyan in Surakarta City (Figure 4).

Figure 4. a. One of the corners of Kampung Laweyan; b. Modern Javanese house hidden behind a high wall [9]

4. Maintaining tradition in modern Javanese houses

The Laweyans always begin the construction of their houses with careful planning strategies based on traditions. The strategies include 1) responding to the tropical climate by making a tower-shaped of the roof and wide terraces for the modern house that shows the climatically responsive system of the traditional Javanese architecture; 2) updating house materials and construction, and moving with
The progress of building technology; and 3) applying recycled materials and elements of the past to remember, honor ancestral heritage, and maintain socio-cultural values.

4.1. Responding to the tropical climate
The application of the shelter system to the development of modern Javanese houses in Laweyan is proven to be successful. It shows the creativity and intelligence of the maker or owner as most houses in Laweyan are planned and designed by the owner himself. Without a correct understanding of the principle of shelter for tropical climates, the utilization of natural potential would not be maximized.

Modern Javanese houses owned by entrepreneurs in Laweyan have undergone very significant developments to make the houses as comfortable as traditional homes. Brick wall houses require many openings for air ventilation, natural lighting, doors, and windows. Whereas the walls of traditional houses are made of woven bamboo which can absorb light and let natural light into buildings without using windows. The expression of 'shelter' architecture in traditional, as well as modern Javanese homes in Laweyan, is through an open and cool atmosphere, in harmony with the humid tropical climate, while shaded from the sun all year round. The process of change occurs over several periods and over a long period of time. Mid-20th century modern Javanese houses in Laweyan were very comfortable, such as the houses of the Cokrosomarto II and Pusposumarto II families. Openings in the form of doors and large transparent windows connect the dalem, pendopo, and gandok in the main house to visually link the rooms. These conditions make the Laweyan's houses suitable for large family gatherings and weddings.

1. Initial conditions: Air easily flows through the sidelines of the tiles that are not too tight.

2. Conditions with the creation of a ceiling that 'can breathe'.

![Old house of Laweyan](image1.png) ![Dalem Puspo house I](image2.png) ![Pendopo Puspo house I](image3.png)

![Dalem Priyo house I](image4.png) ![Pendopo Harjo house I](image5.png) ![Interior Puspo house III](image6.png)

**Figure 5.** Illustration of the development of ventilation holes in the ceiling. Learning processes took place to maximize the natural potential for comfort from a brick house. [9]

Javanese traditional houses generally do not have decking or ceilings. Thus, gusts of wind and a little light can easily pass through the roof, and pores of the walls of bamboo matting. This means that the room can remain cool and dim with light shining through the walls of bamboo chambers. After replacing the walls with bricks, small windows were initially made on each side of the house for ventilation and lighting. This was then changed to better maximize the natural potential of brick housing, after going through a long learning process (Figure 5).
Batik entrepreneurs in Laweyan need a suitable place to dry batik cloth which will allow its color to remain undamaged (ngisis). If dried in the full glare of the sun the color of batik cloth will fade. The best place for drying batik is in the attic or upstairs. There it would most likely experience harder winds, so that the batik cloth can dry without damaging the color, and is safe from rain. The addition of an upper floor also increases the clean area for the final process of batik production because the attic can function as a pavilion or factory. The attic or the upper floor could also be used as a place to sleep or rest for the workers. When batik production has stopped, the upper floor can be developed into additional bedrooms for the family to use or for rent. The upstairs room is more comfortable because it is cooler with the breeze blowing (Figure 6).

![Figure 6. Illustration of the passive cooling system in old homes and new homes. [9]](image)

4.2. Updating building material and technology
In Laweyan, the "spirit of the times" (njamani) or "zeitgeist" turns out to be in line with vernacularity. The development of the main house (omah gedé) is closely related to independence and authenticity. This is closely related to self-expression and the pride of each generation. The development of gandok houses, especially those that function as factories or workshops, appear to be spontaneous and 'as is' with the purpose of being able to functionally meet the needs for places to work and other domestic activities. Vernacularity is characterized by spontaneity and does not involve 'architects'.

The updating of building materials can be seen in Figure 7. The old house structure uses wooden frames with pillars resting on an ompak (base). The structure was then developed with a combination of masonry pillars and wooden beams for attics used for factories. Image A and B are Harjodikoro houses I and are used as a factory house.

The phenomenon of widening the veranda or overhang as a place for various activities is evident in each of the entrepreneurs’ homes in Laweyan. The veranda is open without an outer wall, or if there is one, it has a maximum height of 80 cm, resulting in comfortable conditions for various activities such as receiving guests informally, smoothing batik, folding batik cloth, etc. To overcome excessive exposure to heat from the sun and rain, Laweyans use double teritisan or secondary roofs for their on a veranda with a height of about 3m. The construction of the veranda varies according to the wishes of the maker, but still with consideration of the need for shade and openness. The addition of porches or verandas indicates the nature of the openness of the houses in Laweyan. The values that can be drawn from this phenomenon are njamani (updating) and creativity through the use of new building materials and technology.
The old house’s wooden frame with pillars resting on an ompak is developed with a combination of masonry pillars and wooden beams for attics used for factories.

Open attic with brick arch openings

Concrete beams for an open terrace

**Figure 7.** Updating building material and technology A and B. Harjodikoro I factory house; C. attic above the steps of Cokrosumarto II’s house; D. Back porch of Cokrosumarto I [9].

The traditional way of living in Laweyan includes a strong attachment to family history. The two important familial aspects are *welingan* (message) and *kemandirian* (independence). The message is a tool to connect between generations. While independence is a means to realize the authenticity of the work of each generation fitting to the era. The transformation of the shape of the house can be explained by the theory of Adiyanto that states Javanese architecture is no longer fixed on the physical form, but is on capturing the ‘spirit’ of Java, that is ‘spirit’ to continue the noble traditional architectural values [10]. The vernacularity of the house’s shape transformation is also explained by (image) in architecture according to Mangunwijaya. *Citra* refers to something that is transcendent, which gives meaning and is able to see beyond the facts or behind what is visible [11]. Meanings and imagery include not only the aesthetics form but also the environmental insight that gives opportunities to differ from pre-existing forms. The vernacularity then can also explain the living configuration of
Habraken, tradition and modernity according to Adolf Loos, and sustainable architecture according to Bonenberg & Kaplinski [9].

4.3. Applying reused materials for a permanent house

Respect for ancestral heritage is felt in the Laweyan houses. Notably, various ancient interior elements are still kept, such as decorative mirrors, photos of ancestors and family members, antique lamps, antique furniture, and tables, etc. The initials or names of the makers and the year the house was constructed are carved on the walls and the wooden panels. However, many old elements of the house were replaced with simpler forms, with less wooden carvings. In these houses, simpler forms replace the patang-aring element of a carved wooden wall with a door to the sentong.

Recently, there have been two interesting developments to houses in Laweyan. First, elements of the old houses were for sale because they do not match the planned design of the house. Second, elements of old houses are reinstalled in new houses. This occurred in Rumah Puspo IV (Figure 8) which was built by the third generation of the Pusposumarto family in 2015. The old house’s wood materials including used wood factory materials were applied to the new homes. Moreover, many home elements from various regions are collected and applied to this house. In the context of the vernacular, the act of replacing old house elements and reusing them depends on the desire, idealism, independence, and appreciation (nglhuhrake) for the work of their ancestors.

Figure 8. The use of old building materials for new homes [9].
The permanence of the house in Laweyan can be seen from the examples of the grand and elegant walls of the houses. This can be viewed as the desire of the owner to create a kind of monument that can be seen and used for many generations to come. This permanence process depends on the present, meaning that it changes over time and depends on the economic conditions, spatial requirements, material technology, and models or trends. At the batik business’ peak period, with the availability of an unlimited budget, the permanence of the house was extraordinary. This can be seen in the use of high-quality building materials, dimensions of the house elements such as the construction of very large columns and beams, and consulting or using the services of the best building experts of the time. As a consequence of permanence with the merging of spaces or houses variations of the unification of the roof in the main house were produced by the concepts of ginanda (duplicating), pinotong (intersecting) and ginabung (unifying) [12]. Despite the complexity and the simplification of form occurring, it also has made the house larger and more elegant. Moreover, openings in the walls were constructed to maintain visual interaction and respond to the tropical climate. Meanwhile, the additional house (the gandok) is constructed simpler. This phenomenon contains the values of creativity and development, while still paying respect to the messages of their predecessors.

5. Conclusion
The forms of modern Javanese houses seen today in Laweyan are the result of a mature thought process and a gradual process of development according to the needs, abilities, and desires of its owners. This is the vernacularity in the process of change. The traditional values of how a house should be constructed always seem to change over time and in line with the needs of Javanese families in Laweyan. The modern Javanese house in Laweyan is a sturdy, permanent, yet flexible home to work and conduct business in. Besides that, interaction with the social environment and responding to the tropical climate is maintained in every change.

Nevertheless, each large family in Laweyan has houses with their own unique conditions (outstanding value). Every change in form that occurs can be traced by its reference. Memetri is the best Javanese term for this process of change, which means maintaining and developing. The process continues from the past to the present. Continuousness of the process that is in harmony with local conditions and in accordance with the times, will strengthen autonomy and offer pride. Although at specific periods of time there can be very different shape changes, it is still in line with the principles of maintaining traditions, local wisdom, and authenticity. This, in turn, will benefit the development of the architecture of Nusantara.

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