

# A Study on the Relationship between Majapahit Temple and *Joglo -nDalem* Architecture as Preservation of Ancestral and Cultural Values

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**Abstract** The so-called *Joglo* is a type of traditional house (*nDalem*) architecture since Islamic era on the island of Java that is still used today in Indonesia. *Joglo* architecture is currently not only used for residential buildings but has developed into a multifunctional feature, and so the *Joglo* roof models have been used for office buildings, airports, hotels, and the like. The originally *Joglo* construction made of wood is thought to have been unknown in the past, namely during the Majapahit era or the end of the Hindu-Buddhist era. Through an approach to analyzing the type of architectural form, traces of this temple building can then be identified in the *Joglo* building, although in the form of abstraction of its elements. Javanese society basically has a tradition to uphold the culture of its ancestors, regardless of the beliefs held by the Javanese. *Joglo* architecture can be seen as a representation of the preservation of the temple architecture. The relationship between the temple and the *joglo* is indicated by the shape of the roof, intercropping elements, ornamentation and linearity of the building layout. This preservation is making modifications while still displaying important elements with different materials. As a result, preservation is not orientated to the physical-material but rather to the values of its meaning. The spirit of respecting the past through preservation has unconsciously imbued the architectural ideas involved, so that permanence in architectural preservation can be dynamic through the adaptation process

**Keywords** *Joglo*, Preservation, Majapahit, Javanese, Temple

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## 1. Introduction

*Joglo* is one of the names for the architectural type of traditional houses on the island of Java which is still used today in Indonesia. The term *Joglo* refers to a type of traditional roof in the Javanese tradition. This building was used by kings, nobles, and commoners in the past in Java since the Islamic era (16th century) of the *Demak-Mataram* Kingdoms, as can be found in Yogyakarta (the Sultanate of Yogyakarta being one of the descendants of the Islamic *Mataram* Kingdom) and other areas in Central and East Java [1][2][3]. *Joglo* is part of a traditional Javanese house which is often termed as *Omah*. This *Omah* with a *Joglo* was later known as *nDalem* which in the past was associated with the houses of important people or aristocrats. There are several *nDalem* in Yogyakarta that are still used today [4][5][6].

In its form, the *nDalem* complex in Yogyakarta has a pattern that tends to be the same, that is to say it has two important buildings that are linearly arranged, namely the main building for living which is also known as the *nDalem* and the reception building in front of it called the *Pendopo*, both of which use the *Joglo* roof. In addition, in

the *nDalem* complex there are also other buildings that do not have a *Joglo* roof as a support. This *nDalem* area is limited by a fence wall around it, while the gate is placed obliquely, not aligned with a pavilion building[7].

Traditional Javanese architecture types are basically given names based on the shape of the roof, such as the *Panggung-pe*, the *Kampung*, the *Limasan*, the *Tajug*, and the *Joglo* roofs (Figure 1). The *Tajug* type is seen as the origin of the other ones, so that it is considered the main form [8]. This type of *Tajug* is generally only used for the roof type of mosque buildings or other sacred buildings such as the tombs of kings or saints. The shape of the crown is a

representation of the shape of a mountain so that it is tapered at the center like a pyramid.

Etymologically, the term *Joglo* itself comes from the Javanese words *Tajug* and *Loro* (two), meaning that *Joglo* describes the pattern of the roof of the *tajug* which consists of two like mountains. The *Joglo* type is the result of the development of the *tajug* type, which can also be indicated by the term *joglo* itself which comes from *ju-loro* = *tajug dua*. The shape is marked by the presence of horizontal elements at the top so that the shape has two central points that are connected horizontally, in contrast to the crown which only has one centered point [9].

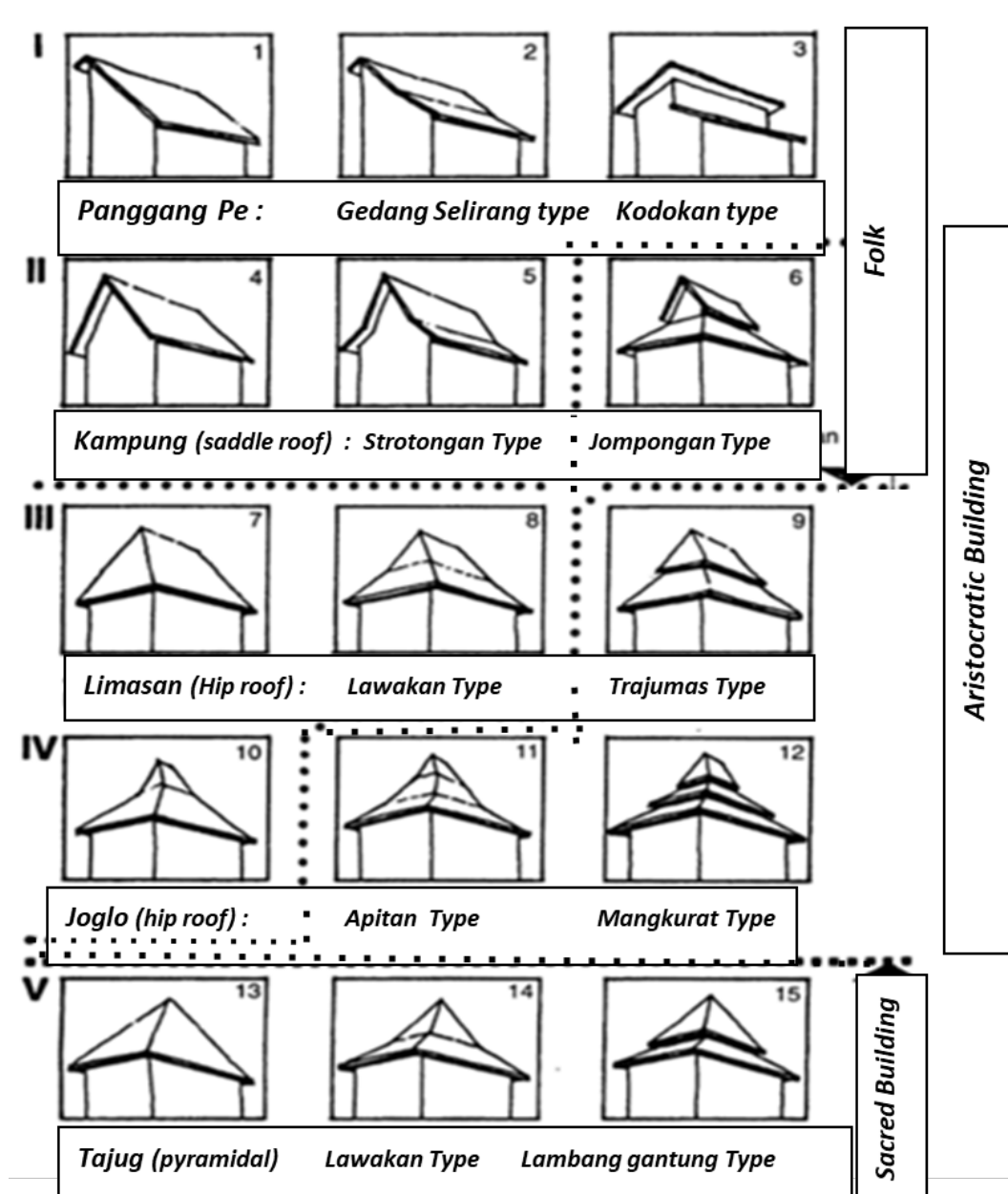
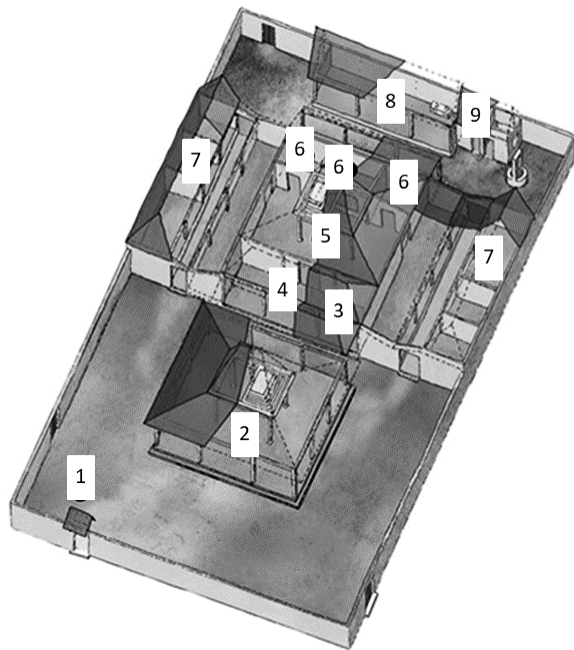


Figure 1. Type of Javanese Architecture [10]



#### *nDalem Complex*

1. *lawang pintu* (gate)
2. *pendapa*
3. *peringgitan*
4. *emperan*
5. *dalem*
6. *senthong*
7. *gandok*
8. *dapur* (kitchen)
9. *kamar mandi* (bathroom)

**Figure 2.** *nDalem* of Javanese Architecture Layout [11]

*Joglo* is a major part of the *nDalem*. The building with a considerable amount of mass in a Javanese house

arrangement consists of a pavilion element that uses a *joglo* roof and functions as a public reception area, and behind it is a semi-public *pringgitan* element. *Pringgitan* is derived from the word *ringgit* or skin (*kulit*). This building in the past functioned as an intermediate terrace that could be used to place a screen for shadow puppet shows (*wayang kulit*). This *wayang kulit* show is like television in modern times as a means of viewing for residents of the house. Behind the *Pringgitan* there is a main building is so called *nDalem* that serves as a residence. *nDalem* has three rooms called *sentong*. The middle part of the *sentong* is considered the most sacred one [12]. Behind this *nDalem* there are supporting functions such as a kitchen-dining area and a well/toilet. The *Pendopo-Pringgitan-nDalem* arrangement is commonly used by the upper middle class. Both *Pendopo* and *nDalem* use a *Joglo* shape as the roof, while the *Pringgitan* can use a saddle type (Figure 2 and Figure 3).

The interesting phenomenon is that this *Joglo* building emerged only during the Islamic period in Java and developed rapidly, estimated to be in the 16th century period between the Islamic *Demak-Mataram* kingdoms [13]. This wooden *Joglo* building was not found in earlier times. The traces cannot be found as in the picture of the reliefs of the temple buildings that were built in the Pre-Islamic era, namely the *Majapahit* Kingdom (13th -15th century) or older kingdoms such as the Hindu-Buddhist *Mataram* kingdom (7th -11th century). The reliefs of temple buildings in this era depict many sacred and non-sacred buildings that were built at that time. The temple building depicted shows similarities with the remaining relics. The appearance of a *Joglo* roof appears on the temple building, but the temple described is related to the construction of brick/stone instead of wood. Thus, it can be said that the shape of the wooden *Joglo* roof is a new form of architectural creativity that did develop in the Islamic era.

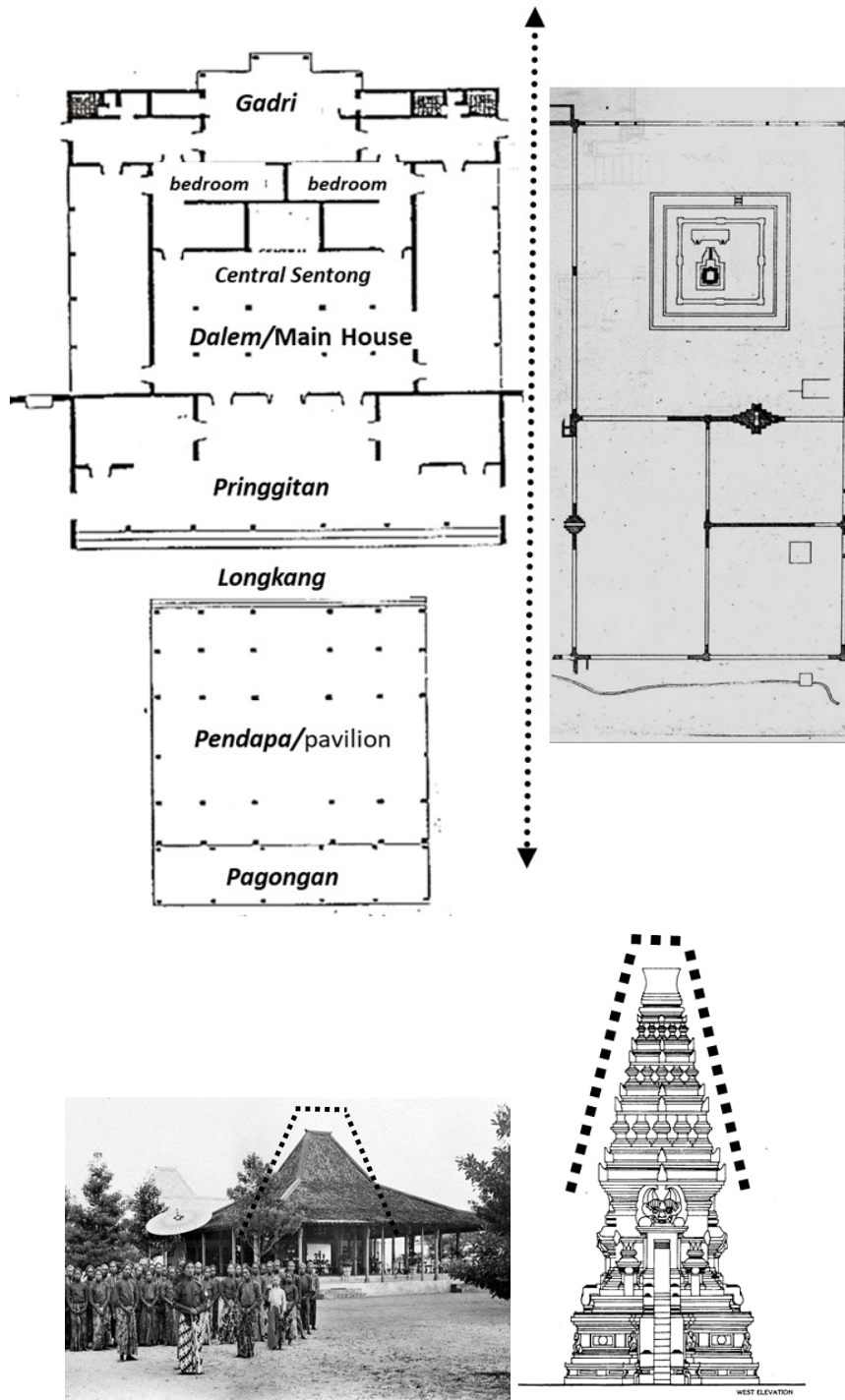


Figure 3. Linearity-Layout of *nDalem –Pendopo* and their roof with *Joglo* (left); Layout and Shape of Majapahit Temple (right)[14][15]

The purpose of this study is to understand the preservation of the *Joglo* form in its relation to the architecture of the previous era, namely *Majapahit*, considering that the form of the *Joglo* has become a timeless one to this day in Indonesia, especially on the island of Java. The concept of preservation cannot be separated from local wisdom that has been prevalent for a long time on the island of Java, especially with regard to ancient architectural traditions such as those belonging to the *Majapahit* earls and Methods.

## 2. Material and Method

### 2.1. Method

The research is qualitative in nature with a descriptive-exploratory approach through the comparative method. Furthermore, in data analysis, morphological and typological analyses were used that were supported by historical studies[16]. Descriptive studies seek to describe symptoms, variables, or circumstances such as the

architecture of *Joglo-nDalem* and Majapahit temple, while Exploration is used to explore possible relationships between these *Joglo-nDalem* buildings and Majapahit temples through comparative studies between the two.

**Data Collection:** The data sources in this study consist of primary and secondary sources. The primary sources of this research are the buildings of Majapahit temples and *Joglo-nDalem* buildings in Javanese architecture, including form, spatial and mass as well as tectonic aspects. Secondary data sources in this study made use of articles and previous research related to the object being studied, as well as interviews conducted with expert informants.

**Data Analysis:** The data analysis through a comparative study in this study attempted to analyze the morphological and typological relations of the architecture of Majapahit temples and *Joglo-nDalem* architecture in Javanese vernacular architecture. The typo-Morphological analysis was carried out through the architectural aspects of form, spatial planning and building masses. Furthermore, a comparative analysis of the two was carried out, supported by studies of Javanese history and culture. This study is connected with the preservation of the local community's past traditions in Java.

**Data Interpretation:** The interpretation stage can also be referred to as the answer to the research objectives. In this study, the interpretation of the data includes examining the similarities and transformation patterns between the architecture of the Majapahit temple and the *Joglo-nDalem* building which is supported by historical and cultural analysis. Thus, in this case the expectation is that the relationship between the Majapahit building and the *Joglo-nDalem* architecture can be reconstructed, bearing in mind that it is in the context of respecting and preserving the ancestral heritage in the Javanese tradition.

## 2.2. Analysis Approach

This research begins by conducting a historical study covering the background of temple architecture in the *Majapahit* era and residential architecture in the *Demak-Mataram* era. This historical study is supported by archaeological sources related to these buildings. This historical study is subsequently used as a basis for drawing comparisons between the architectural forms through a typological study including spatial and mass patterns, and the shape of the building. The study of typology is a tool used to explain the precedent of an 'architectural form', through the analysis of the elements/properties of its constituents. This study of typology will provide a clear picture of the elements that remain and change in the development of architectural forms [16]. Architectural studies generally emphasize the analytical process related to the correlation between aspects of the parts and aspects of the whole in a design. This correlation can be understood in terms of being interpreted through understanding coherence, ratio, unity, imitation and fragmentation in architectural design forms [17].

This study was also carried out by examining the cultural aspects behind the *Joglo* architecture. Therefore, in addition to the historical aspects related to typology, a study of the cultural background of the Javanese people has also been carried out based on anthropological sources. This cultural background is useful for understanding the cultural meaning of buildings in relation to habits in everyday life in the context of phenomenology. Thus, the values in the Javanese tradition can be recognized in greater depth, such as how the Javanese people respect their ancestors through their cultural expressions.

This study of cultural meaning is regarded as being able to understand the approach to preserving past values through architectural physical forms such as the *Omah Joglo*. [18][19][20]. This research is supported by literature studies and field observations including studies of *Majapahit* heritage buildings in the form of temples, and traditional Javanese *Omah* buildings. This research is further supported by interviews in the field, especially in understanding the preservation of these traditional Javanese values, especially in the *nDalem* type of building in Yogyakarta which was inhabited by several descendants of nobles in the past.

## 2.3. Preservation Theory

The purpose of preservation, among others, is to maintain the cultural meaning attached to an object, especially when dealing with a new culture that is developing. To continue the old with the new, it is necessary to preserve it. According to [21] cultural meaning is the meaning of the message of a place or historical building. Cultural meaning is composed of a set of values which, if lost, will reduce the value of a building. Cultural meaning consists of cultural values which include political/social values, spiritual values, architectural values, craft values, historical values, and symbolic values. Preservation plays a role in elevating the values that are considered appropriate [22].

Javanese society basically has a tradition to uphold the culture of its ancestors, regardless of the beliefs they hold. This trait does not just appear but has been preserved from generation to generation, as can be seen in the proverbs of the Javanese tradition [23], namely '*mikul dhuwur mendem jero*' (respect for elders); '*Kacang ora ninggal lanjaran*' (Children's habits are always imitated from their parents); '*Dumadining sira iku anane papa biyung ira*' (You came into being because of the creation of your mother and father, so that both parents must be glorified); '*Nguri-uri budaya*' (to preserve your culture ) '*memayu hayuning bawono*' (to make the world beautiful). Some of the proverbs inherent in the ideas or thought patterns of the Javanese people show that the culture of preservation is part of the appreciation of the past or ancestors.

The entry of Islam did not necessarily change the concept of habits inherited by the Pre-Islamic tradition and this is carried over with the new culture by making

adaptations. Javanese culture shows the spirit of preservation as expressed by modern conservation theories such as conservation to adaptation in order to maintain the cultural meaning. This can be recognised to this day for example through the *tumpengan* (rice cone) - *selamatan* (salvation) tradition. *Tumpengan-Selamatan* [24] is the use of food elements in the form of a triangular cone mountain in the shape of *tumpeng* (rice cone) for wedding ceremonies, celebrations of holidays, birthdays and other events, and is carried out by individuals ranging from ordinary people to the president. The shape of the cone is basically preserved and adapted from ceremonies in the Pre-Islamic period as a form of respect for gratitude to God in a new form. Analogous with the *Tumpeng* phenomenon, *Joglo* is also expected to be the same, which was adapted

from Pre-Islamic *Majapahit* architecture into a new form of architecture.

This *Joglo* shape is not recognized in the relief depiction in relation to wooden buildings in the *Majapahit* era, but it looks closer to the coherence of the stone/brick temple building. The use of a form like this temple shows the spirit of preservation/conservation of old architecture which is transformed into new forms and functions. The nature of Javanese society is basically to respect the ancestral culture. The form of this respect is not oriented towards maintaining its physical appearance, considering that beliefs have changed, but important values in that form are preserved. Through creativity, a new architectural form emerges but still contains the previous values (Figure 4).



**Figure 4.** *Majapahit* Temple Relief: Wooden Building – *Limasan* (upper) and Stone Building, *Majapahit* Temple (candi), and *Joglo* House (below) [26]

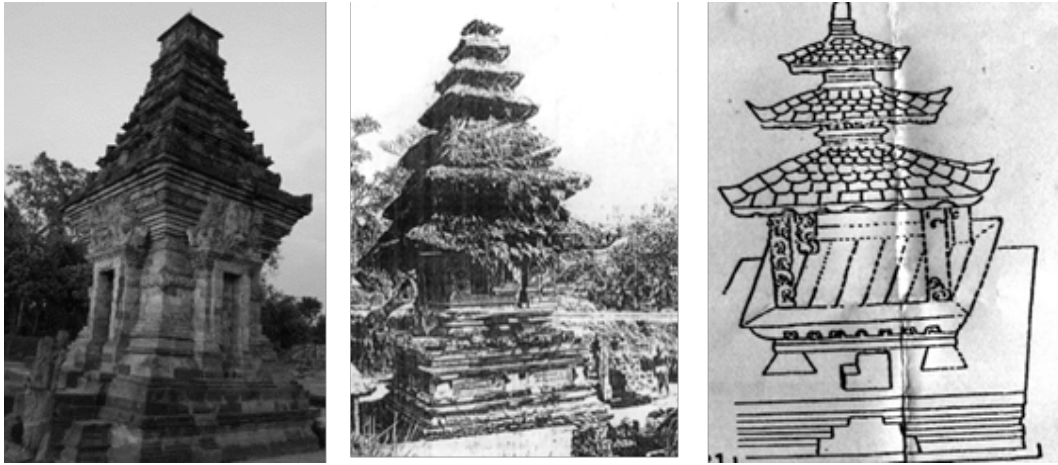


Figure 5. *Majapahit* Tower Temple [26]

### 2.3. Majapahit Temple (Candi)

Based on the material, the *Majapahit* temple has the following characteristics: The temple building is a tower type made of stone or brick from the feet or bottom part to the roof; The temple building is a tower type combination of stone/brick and wood; The temple building is a tower type made of non-brick/brick material from the feet to the roof (Figure 5). This type of building can only be seen in the depiction of reliefs. This is because the remainder of the artefacts has been completely destroyed [26].

Temples in Hindu-Buddhist cosmology are philosophical symbols or replicas of Mount Meru. The expression of a towering mountain is interpreted as connecting the earth and sky. The description of the cosmic environment is characterized by the page design laid out in layers and centered with the central courtyard in the highest place, the temple as a symbol of Mount Meru being located in the middle as the center of the world. In this light, the people at that time must have built the temple hoping to live as close as possible to the center and be able to communicate with the transcendental world [27] in general, based on the shape of the temple, it can be divided into three main parts [28][29][30] namely (Figure 5-left):

1. Foot. This section symbolizes the underworld or *bhurloka*. In the Buddhist concept it is called *kamadhatu*. This describes the world of animals, the realm of spirits such as demons, giants and asuras, as well as the place of ordinary humans who are still bound by low desires. The stairs to enter the temple are located in this section. In the center of the base of the temple, just below the main room, there is usually a well with a coffin of *pripih* at the bottom. *Pripih* can be ashes or relics of sacred objects such as gold sheets inscribed with spells, ancient coins, gems, glass, and others.
2. Body. The body of the temple is the middle part of the temple which is considered the transitional “in-between” world or *bhuwarloka*. In the Buddhist concept, it is called *rupadhatu*. This section describes

the world in which the holy man strives for inner enlightenment and perfection. The body of the temple consists of a *garbagriha*, which is a chamber (room) in the middle of which contains the main statues, such as statues of gods/deities, bodhisattvas, or Buddhas worshiped in the temple.

3. Roof. The roof of the temple became a symbol of the world above or *swarloka*. In the Buddhist concept this is called *arupadhatu*. This section describes the heavenly realm where gods and spirits that have attained perfection reside.

The interesting aspect of the *Majapahit* temples is that even though the three divisions are still the same, the manifestation of the shape differs from the ancient *Mataram* era temples with relics such as Borobudur and *Prambanan*. *Majapahit* temples have their own uniqueness that is markedly different from the temples of the Ancient *Mataram* era in the 6th-11th centuries.

Significant differences can be recognized in the silhouette that forms an inward curved silhouette pattern, the processing of the appearance in the form of horizontal lines, especially on the neck between the body and head, and the shape of the roof. The temples of the ancient *Mataram* era seemed to have no neck, while the *Majapahit* era featured a neck in the form of processed horizontal stripes that were processed in wide poles.

The roof of the *Majapahit* temple is made of brick or stone, arranged in a monolith with a slightly curved shape with a cuboid crown. The shape of this cube is reminiscent of the shape of the base of the seat like a coffin of *pripih*. The cube shape appears with a flat roof, possibly as a stand or *sthana* for the deity present. The principle of its presence is not manifested in the form of a phallus (physical), but in an abstract metaphysical nature, namely emptiness. This is also found on the island of Bali with the model of the chair being emptied on the *padmasthanapelingih*/worship media. *Padmastana* in Bali is a legacy of the final form of the *Majapahit* temple.[31]In the middle of the temple ceiling there is a sun symbol. Belief in the sun god was

very popular in the *Majapahit* era.

The mass arrangement of the temples of the *Majapahit* era is generally linearly arranged, which is divided into several pages in an odd number. The courtyards were bordered by gates and/or walls (though, nowadays many walls have been destroyed). This reinforces the concept of hierarchy for worship visitors. When viewed at a glance, the gates of the *Majapahit* temple complex are generally not aligned with the main temple, but are slightly shifted to the right or to the left (Figure 6).

**2.4. Relationship Roof Shape**

The shape of the *Joglo* roof forms a pattern that rises upwards. This towering form is a manifestation of the values of respect for the mountain. Mountains in old beliefs

are places where ancestral spirits unite the gods and reside. Using a towering shape like a mountain is an effort to preserve old beliefs. Although the religion has changed from Hinduism-Buddhism to Islam, the sacred values related to mountains have still been preserved. This slightly curved towering shape is identical to the façade of the brick/stone temple roof of the *Majapahit* era. The appearance of this curvy towering shape on the relief can be recognized to describe the sacred building known as the temple. The interesting aspect is that what is preserved here is the form that comes from sacred buildings, and not from non-sacred buildings in the *Majapahit* era. Thus, it can be understood that the roof of the house in the Islamic era represents sacred values derived from sacred buildings during the *Majapahit* era (Figure 7).

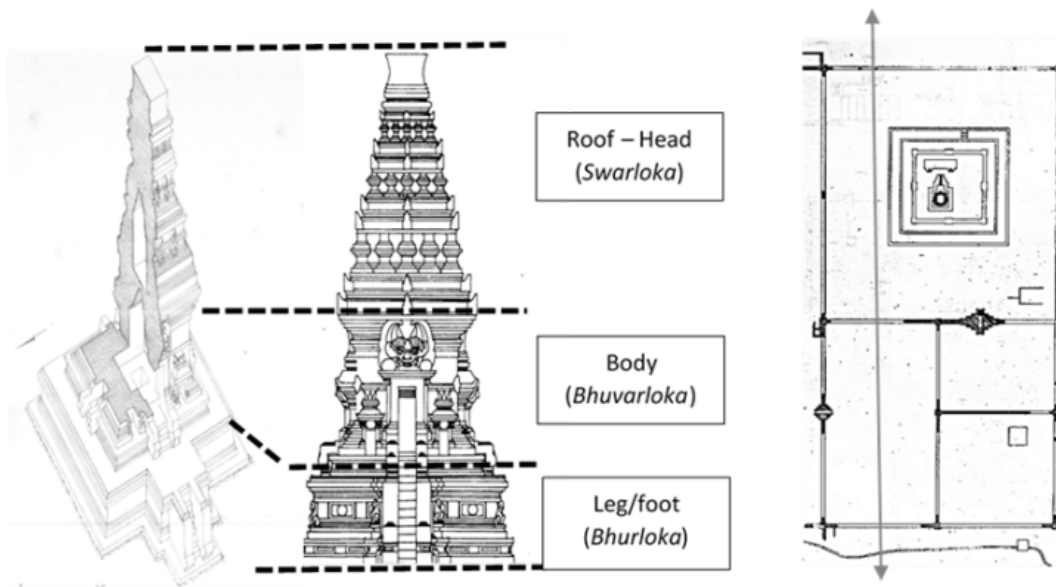


Figure 6. Temple (*candi*) division (left) and Layout *Majapahit-Singosati* Temple (right) [30]



Figure 7. Roof of *Majapahit* Temple (*candi*) (left) and *Joglo* Roof (middle - right) [14][30]



### 2.5. Form of *Tumpang Sari*

*Tumpang Sari* is one of the cores of Joglo architecture. The *Tumpang sari* character is a terraced pattern supported by four main columns or *sakaguru* in a *Joglo* building. At the very top of the *sakaguru* pole, namely the *Tumpang sari*, there are several layers of wooden blocks that form a tiered pattern that extends outward and inward. This expansion to the outside is called *elar*. *Elar* in Javanese means 'wing' whose function is to support the roof area, while widening to the inside to support the *Joglo* ceiling is called *elen*. The shape of the *elar* is reminiscent of the terraced shape of the neck of the temple façade from the *Majapahit* era, while the *elen* which is stepped on is reminiscent of the ceiling pattern of the interior of the temple [12].

The shape of the *elar* and *elen* is a preservation of the neck and ceiling of the *Majapahit* brick/stone temple. What distinguishes it from the *Majapahit* temple is the material, for the temple is made of brick/stone whereas the *Joglo* is made of wood. In addition, the difference is shown in the nature of the construction, for the temple uses a shear wall whereas this *Tumpang sari* uses a framework system with supporting pillars. However, even though the materials and construction properties are different, the expression is attempted to be the same, namely the appearance of the steps, both in the *elar* or the ceiling, resembling a temple. The use of the same expression with a different

construction system is nothing but an effort to preserve an appearance from the past, namely the *Majapahit* temple (Figure 8).

According to the *Kawruh Kalang* book, what is called a *Joglo* besides *Tumpang sari* has the main structure in the form of a *Rongrongan* structure (cavity or space), which consists of *Umpak, Soko Guru, Sunduk, Sunduk Kili, Pengret, and Blandar*. The *Joglo* construction is supported by 4 *Soko Guru* (main pillars) [1][32]. This number is a symbol of the influence of forces originating from the four cardinal directions, or commonly called the *Papat* concept. This concept is reminiscent of the legacy of the *Majapahit* era related to respect for the cardinal directions. In this concept, humans are considered to be in the middle of the intersection of the cardinal directions, a place that is considered to have magical value.

This place is hereinafter referred to as *Pancer* or *Manunggaling Keblat Papat*, which means the merging of the four directions and one center in the middle. The phenomena mentioned above reflect Javanese people who can be classified as archaic-minded people who place cosmology as something important in their lives. Those who believe that life is influenced by forces that arise from themselves (*Jagad Alit / Microcosmos*) and forces that arise from outside themselves or the natural surroundings (*Jagad Gede / Macrocosmos*) in the four winds [19][20][33].

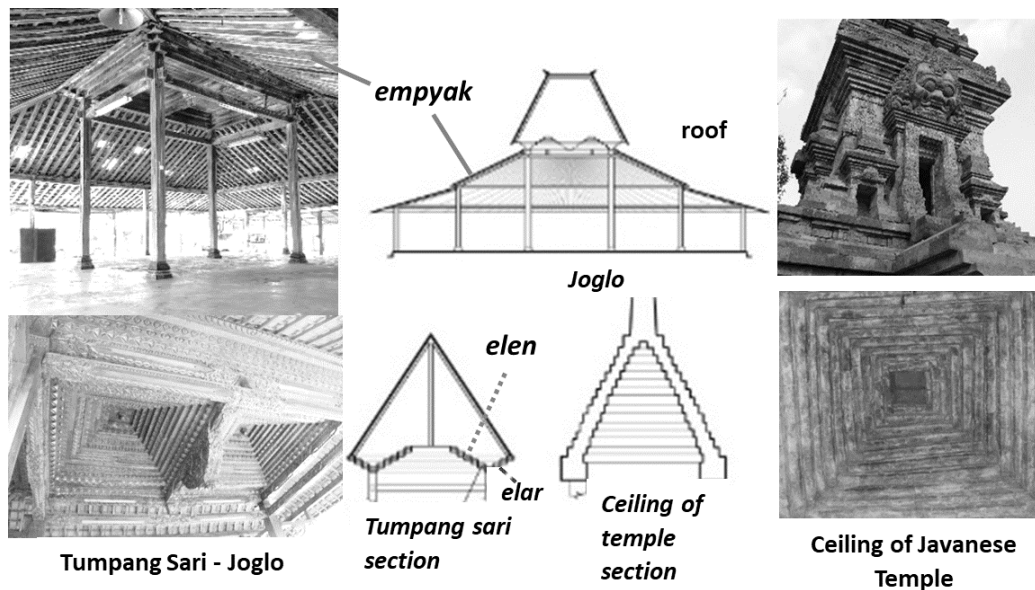


Figure 8. *Tumpangsari-Joglo* (left), Transformation from temple to *Tumpangsari-Joglo* (middle), *Temple* (right) [12][16]

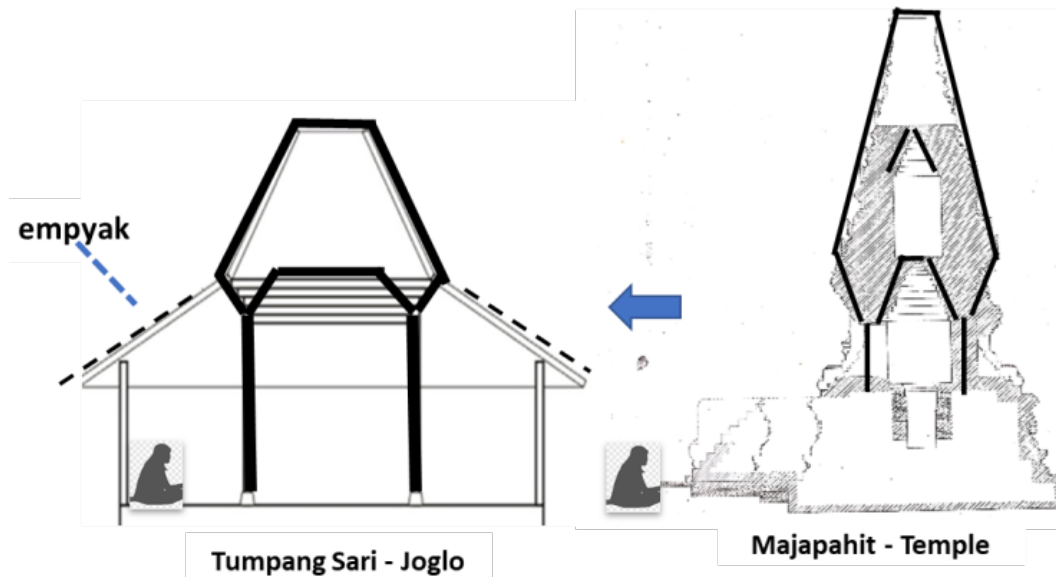


Figure 9. Preservation for respecting ancestral heritage

The existence of this *empyak* serves to support the function of the dwelling below it and functions like an overhang to answer the tropical climate factor where every 6 months there will be a rainy season. The core representation of *Joglo* architecture, namely *sakaguru-tumpangsari*, is nothing but a picture of the preservation of the form of the temple with a new approach, namely the transformation of the shear wall system to the frame, from stone/brick to wood in the context of respecting ancestral heritage (Figure 9).

## 2.6. Spatial Lay-out and Mass

This *Joglo*-roofed building in the form of a residence or house can stand singly or in pairs linearly. In a complete *nDalem* residence, there is usually a private core building known as *nDalem* and a public building known as *Pendopo*. This pavilion is reminiscent of the *Mandapa* which is the name of the reception building in front of a temple in India. The *nDalem-Pendopo* pattern is reminiscent of the *Garbha Griha-Mandapa* pattern which is arranged 1-1. The 1-1 pattern can be discerned in the lay-out of the main parts of the temples in the *Singosari-Majapahit* era such as *Kidal*

temple, *Jawi* temple, *Bangkal* temple, and others.

The arrangement of the temples in the *Majapahit* era on the site forms an elongated linear composition, slightly different from the temples of the Ancient *Mataram* era before *Majapahit*. This composition is reminiscent of the arrangement of temples in South India in particular. In the composition of an *nDalem* residence complete with a pavilion, the arrangement also forms an elongated linear pattern, with a pavilion in front of the main building or *nDalem*. In *nDalem* the use of linear patterns is basically the preservation of old patterns that are considered sacred in daily life, considering that in the Islamic era there was no longer any temple construction as a representation of the ancestors (Figure 10). The building of worship no longer uses a temple but has been replaced by a mosque. To preserve the tradition of glorification and respect for ancestors, it is then enshrined in the form of a residential arrangement so that it blends with everyday life. This preservation was originally thought to have started from the nobles or officials because the *nDalem* containing a pavilion is usually inhabited by this particular group in their dwelling.

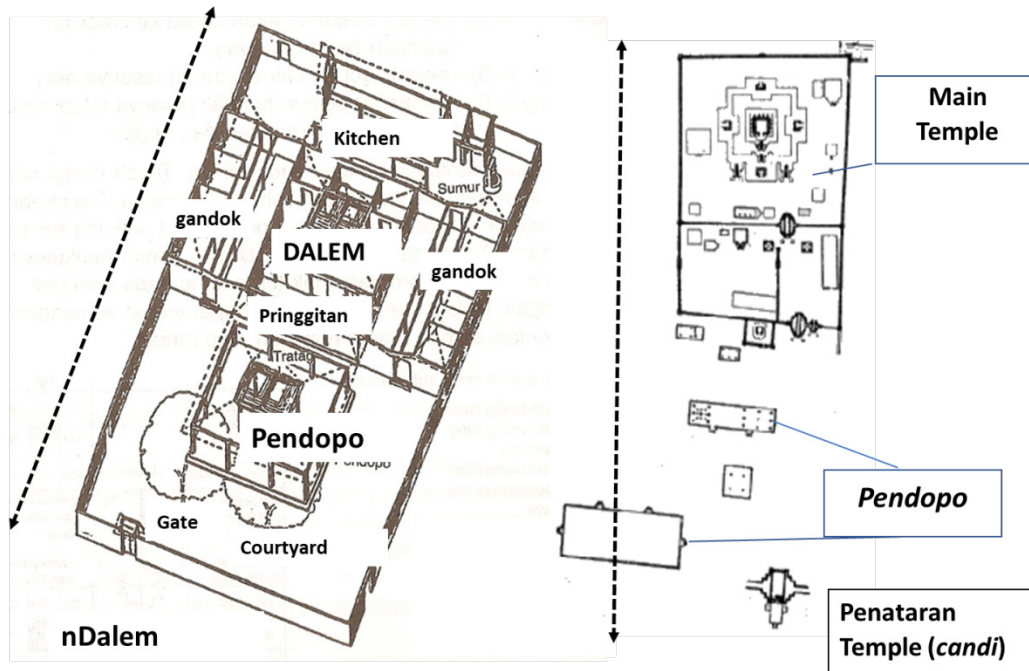


Figure 10. Linearity on *nDalem* (left) and *Majapahit* Temple (right) [10] [30]

## 2.7. Ornamentation

In the *Joglo* building, ornaments are also found on the crown-*wuwung* roof, the *jurai* roof, *Tumpang sari*, beams, columns, door-window darn, *umpak* foundation, and so on. This shows that the *Joglo* building is also ornamental from simple to complex forms. Although it seems plain, usually in the dwellings of ordinary people, ornaments are still presented in limited forms, such as the construction joints, the ends of the *jurai*, and so on.

*Majapahit* temple buildings also use ornaments [31]. The use of ornaments in *Joglo* [2][4][34][35][36] is a preservation effort that originates from past buildings, especially *Majapahit*. The use of this old ornament can be seen in the motifs of *lung-lungan* or tendrils of plants that are commonly used on temple walls. In addition, there is a pattern of mountains that resemble the idea of mountains. The temple is a representation of the mountain where the

Gods/deities reside. The most visible pattern is the use of *tlancapan* and *banaspati* which are identical to *tumpal* in *antefik* and *kala* temples. Another pattern that is recognized in temples is the Diamond. The diamond (*wajikan*) is in the form of a rhombus in the middle of which there is a flower style. On the *Tumpangsari* ceiling, it also shows the use of sun motifs such as on the ceilings of *Majapahit* temples (Figure 11).

The use of these patterns is to continue the *Majapahit* tradition in processing buildings, but adapted to the beliefs held. Islam does not justify the use of human or animal forms in buildings, therefore the old ornamental motifs used are geometric and plant shapes or adapted to shape so that they do not resemble human forms. This motif is then also found in the art of Batik. Some of these batik motifs continue ancient motifs such as *kawung* which is thought to have been used in *Majapahit* era clothing, as can be seen in the statues of *Majapahit* heritage.

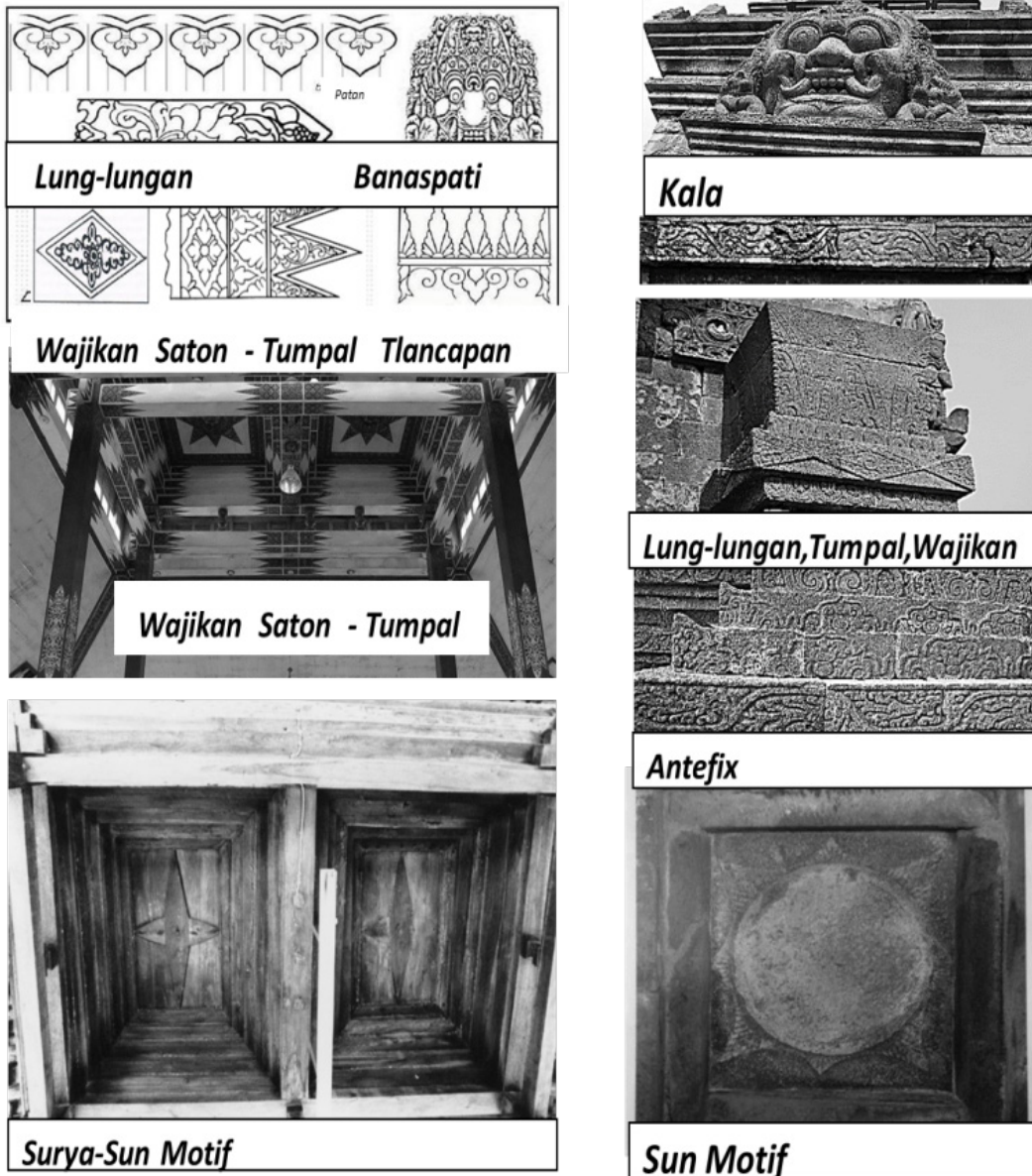
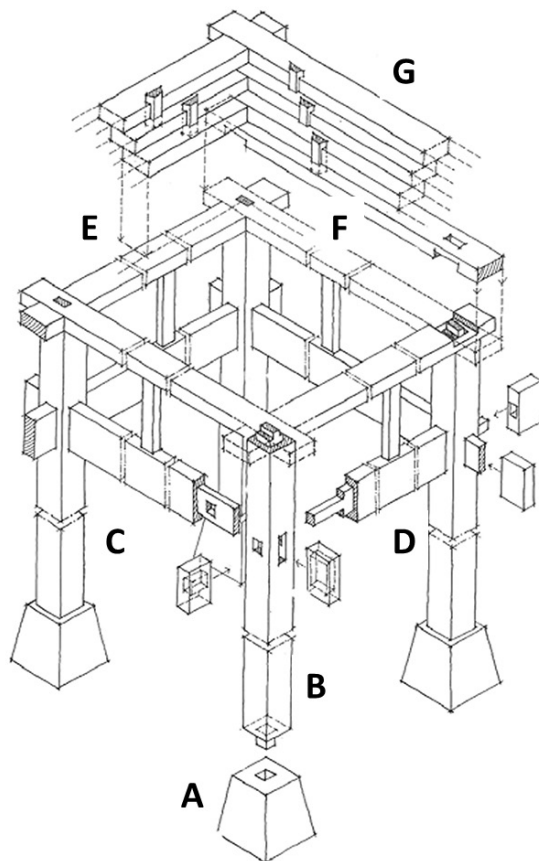


Figure 11. The Similarity of *Joglo* (left) and Temple (right) ornamentation [2][3]

## 2.8. Tectonic



- A. *Umpak* (Foundation)
- B. *Soko Guru* (Main Pillar)
- C. *Sunduk*
- D. *Sunduk Kili*
- E. *Pengeret*
- F. *Blandar*
- G. *Tumpang Sari*

Figure 12. The joint on wooden Joglo construction [38]

On the other hand, there is a modification of the temple building as seen in the tectonic context. The embodiment of the towering shape and the terraced neck was then applied to the wood material, considering that it was no longer possible to use heavy stones or bricks. Stone and brick were then used for the floor and the walls were not used for the roof [3]. The connection between the elements of the larger part in the structural system of the *Joglo* building is a flexible (elastic) bond (Figure 12). The principle of bending here is shown in the form of the connection system and has the meaning of the structural concept that the possibility of residents to save themselves in the event of an earthquake has the opportunity to get out of the house before the building is damaged, breaks or collapses [37].

## 2.9. Joglo Revisited

Preservation carried out in the form of *Joglo* from the architecture of the past can also be read in the perspective of postmodernism [39] today. Robert Venturi designed Franklin Court Philadelphia in 1976 to bring back the memory of an old building, and Michael Graves designed his Portland Building to present a keystone pattern in the figure of the building. Venturi alters the original material with a steel frame that resembles the shape of an old building in order to shed light on traces that come from the past, similar to the spirit that Graves evokes (Figure 13). *Joglo* can be said to be traces of the past that are preserved and come from sacred buildings.

Regarding the form of the *Joglo*, there are also other opinions that this towering shape resembles the architecture of Eastern Indonesia, namely that of Sumba – *Uma Batangu* [42]. However, on the other hand, based on age, it has not been proven that *Uma* is older than *Joglo*, moreover, it is located far from the island of Java. Javanese nobility, of course, if they have to make new ones, are bound to look at sources that are close and, needless to say, come from their past history. Sources could also refer to areas that are considered old, such as *Sumenep*, whose residential architecture is in the form of a *Joglo* [43]. *Sumenep* was an important area of *Majapahit*, and it is not impossible that *Sumenep* also imitated the shape of the temple. The *Sumenep* community no longer adhered to Hinduism and converted to Islam after the collapse of *Majapahit*, so it was also possible for the building to have been composed. In the past, Sumba was also the territory of *Majapahit*, so it is not impossible that a phenomenon identical to *Sumenep* occurred there (Figure 14).

This *Joglo* architecture was not discontinued in the Pre-Modern period, but has persisted to this day. *Joglo* architecture is not only completely preserved in its concrete form but also in its implemented shape or figure. Its form can be combined with others. Government buildings in Central Java make use of the *Joglo* type as their icon, and the same applies to other buildings in other Javanese provinces. The *Joglo* type has subsequently become an Architectural Icon following the Javanese tradition in the modern era. Several buildings that preserve *Joglo* architecture can be shown as in Paul Andrew's work (Figure 13), namely Terminal 1 and 2 of Soekarno Hatta International Airport [44] which in addition to the use of the hotel building is known for the use of *Joglo* architecture for its cottages. Even though today's housing is contemporary, there are still many housing compounds that employ the *Joglo* type, both as the main and supporting buildings. Thus, *Joglo* can represent cultural meaning composed of a set of values that have existed in past architectural traditions. Reusing *Joglo* architecture is synonymous with preserving these past values from both the Islamic and *Majapahit* eras.



Figure 13. Franklin Court Philadelphia and Portland Building [40] [41]



Figure 14. *Uma Batangu-Sumba* and *Tanean-Sumenep* (upper) Sukarno Hatta Airport (below) [44][45][46][47]

### 3. Conclusion

Based on the above study, it can be understood that Joglo architecture, especially in *nDalem*, is a preservation of ancestral architecture, namely Majapahit era temples by people who live according to Javanese traditions. This preservation is not in the nature of making the same replication as stone/brick temples but rather modifying it by still displaying important elements with a new look considering that there has been a change in material. Material changes do not affect the display expression to be realized, so that the silhouette of the brick/Majapahit stone temple elements is still clearly displayed through the intercropping and processing of the roof. This construction is no longer supported by bearing walls but is replaced by a wooden frame construction in the form of pillars-soko guru columns

The relationship between the temple and the joglo is indicated by the shape of the roof that is equally towering, the elements of *Tumpang Sari* that are identical to the neck and ceiling of the temple, the presence of identical ornaments, and the building layout that forms a linear pattern. It can be understood that the Joglo architecture, especially in *nDalem*, is a representation of the preservation of ancestral architecture, namely that of the Majapahit era temple by people who live according to Javanese traditions. This is also supported by the opinion of Sato [44] that the traditional house for Indonesian people is basically the residence of their ancestors, the current occupants are 'only' just a ride.

Ornaments are still displayed on the building elements even though they have been modified. The linear lay-out of the building shows similarities to the spatial arrangement of the temples of this era. Thus, the *Majapahit* brick/stone temple can be seen as an archetype in the post-*Majapahit* era buildings, especially those displayed in this *Joglo* form. Basically, an archetype communicates and underlies the expression of basic desires, meaning and purpose of life, and motivations of individual Javanese people, such as respecting their ancestors, namely Majapahit.

Preservation is an effort made in expressing the archetype in a form that is used daily, namely residential architecture, considering that the temple is no longer used because beliefs have changed. This spirit of respect has unconsciously imbued the idea of architecture. Respect for ancestors is a basic characteristic of Javanese society, which is not static but can be dynamic through adaptation processes such as the *tumpang-selamatan* tradition. The display material can be changed or replaced by a new one, but while still maintaining its cultural properties/values, it is sought to be preserved. This Javanese-style preservation makes the architecture dynamic, because it is not only centred on the material or physical, but on the values or meanings that are conceptual.

Permanence in the context of preservation here does not mean being orientated to the physical but is more conceptual. The shape of the temple can be preserved

through other preparations while maintaining its primal values such as its silhouette or others. In the Javanese proverb '*Dumadining sira iku anane papa biyung ira*' (You have come into being due to the creation of your father and mother, so both parents must be glorified), ancestors must be glorified and respected.

'*Kacang ora ninggal lanjaran*' (there is a habit of children always imitating their parents with certain dynamics) signifies that the *Joglo* has become an architectural bridge from the past, present, and future. The bridge from the pre-Modern era covers *Majapahit* to the Islamic era, followed by the pre-Modern era to the current Modern era with its embodiment into architecture with multiple functions, and adaptive reuse.

This conservation effort is very much needed in building a local identity in the face of globalization that can eliminate boundaries. Through preservation, this *Joglo* Architecture can be further developed as an embodiment of uniqueness that refers to these local values so that it distinguishes it from buildings outside Indonesia. As another Javanese proverb expressed, *nguri-uri budaya* (caring for, maintaining and preserving one's culture), in the context of *memayu hayuning bawono* (making the world beautiful [through architecture], but without leaving local traditions behind).

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