

EXPLORING SPATIAL TRANSFORMATION ON JAVA TRADITIONAL HOUSES BASED ON THE HIERARCHY OF NEEDS

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ABSTRACT

Housing is one of the basic human needs that is dynamic and more than just a place to shelter, so changes based on needs are inevitable. In the house, spatial organization often changes so that it transforms, especially in traditional Joglo houses that face pragmatic changes or still follow traditional values. A qualitative research approach was conducted using the observation method, combined with in-depth interviews, and integrated with Maslow's hierarchy of needs theory. Maslow divides the needs into five levels. Therefore, it is essential to understand changes in spatial and household needs. In this study, we found five cases of Joglo houses, spaces used for commercial activities economically tend to come from esteem and self-actualization needs; another five Joglo houses with spaces used as a place for social and cultural activities; based on belonging, esteem needs, and self-actualization; and another two Joglo houses that have spaces transformed and or converted into personal spaces based on fundamental and safety needs. Our findings show that spatial had altered based on user needs in a bottom-up and reciprocal manner. This can be demonstrated by the absence of massive facades and spatial layout changes, which still maintain spaces that are considered essential, such as *senthong*, *gandhok*, and *pendhapa*. Spatial transformation is also influenced by the capabilities and background of Joglo house owners, who mostly have businesses and or come from respected families to maintain the legacy of Joglo houses and make the house a residence and a symbol of prosperity and well-being. In addition, with spatial transformation, Joglo houses can still meet the needs of users/residents to the level of self-actualization. This study offers a new perspective on combining a hierarchy of needs and spatial transformation, specifically in joglo traditional houses.

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1. Introduction

One of the impulses in changing is needs. Because needs are the basic things of humans and human activities are based on needs, humans tend to want to fulfill them when there are unmet needs (Desmet & Fokkinga, 2020; Ford, 1987). In this life, changes will always occur, including in architecture. Transformation will always exist and is an inseparable part of human life, including housing (Durmus, 2017; Khan, 2014). Changes in big cities can occur on a macro-scale, such as changes in land functions, changes in urban spatial order, changes in population diversity, and changes in environmental quality (Li et al., 2024; Yang et al., 2024; Zhang et al., 2024) and a micro-scale, such as housing. Housing is one of the basic human needs that can be a dynamic determinant of social welfare (Amiryar & Asano, 2022; Rolfe et al., 2020) and can affect residential conditions and cause housing transformation (Avogo et al., 2017). The space in a residence must have value and function, and it must not only be in physical form (Zavei &

Jusan, 2012). One of the needs in residence that often changes is spatial organization (Aryani et al., 2015; Avogo et al., 2017). Spatial organization in residence can reflect how residents interact with each other and the outside realm (Spanedda & Fusaro, 2020).

Compared to modern houses, traditional houses have language and patterns that can describe culture and values and reflect the locality's identity (Asriana et al., 2024; Wazir & Indriani, 2020). Traditional houses, which are long-lived and have undergone changes, are faced with the risk of following traditional rules or pragmatically following more modern ways that can threaten the value of a traditional house (Asriana et al., 2024; Michelle & Purbadi, 2021).

In Yogyakarta, the Joglo traditional house is one form of Javanese house with an ideal, complete spatial arrangement, as a symbol of social class status, and it is generally owned by the upper middle class (Idham, 2018; Kusuma & Damai, 2020; Memmott & Ting, 2020; Santosa, 2000; Wazir & Indriani, 2020). Joglo traditional houses are

seen as part of the microcosmos, which is reflected in spatial arrangements, house structures, and ornaments that are visible and contain meaning (Prijotomo, 2005; Waterson, 2012).

In the past decade, many studies have discussed the spatial organization that transforms in the context of modern and traditional housing (Alitajer & Molavi Nojoumi, 2016; Ding & Ma, 2020; Lin et al., 2024; Obeidat et al., 2022; Yaylali Yıldız et al., 2018; Yenice et al., 2022), spatial transformation in tradisional houses (Al Husban et al., 2021; Ding & Ma, 2020; Hariza Hashim et al., 2009; Michelle & Purbadi, 2021; Sarmini et al., 2018; Susanti et al., 2018; Vitasurya et al., 2018). In addition, there are pretty several studies on Maslow's hierarchy that touch on the field of architecture and housing, housing quality (Idham et al., 2010), housing attributes (Zavei & Jusan, 2012), spatial transformation (Moshaver et al., 2024), spatial optimization (Zhai et al., 2023) and residential satisfaction factor (Jung & Lee, 2023). Although there have been many studies in this field, little is known about spatial transformation in Joglo traditional houses, especially from Maslow's perspective on basic needs, and it is essential to fathom spatial transformation in Joglo traditional houses.

In this study, the authors aim to examine and explore spatial transformation, especially in Joglo traditional houses in Kotagede, Yogyakarta, based on Maslow's hierarchy of needs. The research results are expected to provide a new perspective on spatial transformation regarding Maslow's hierarchy of needs.

2. Literature Review

2.1 Joglo Traditional House

Rumah or *omah* for Javanese people comes from the word *omah-omah*, meaning household (Santosa, 2000). For the Javanese, the house symbolizes prosperity and well-being and is considered to have a soul to provide strength for its owner (Budiwiyanto, 2013; Kusuma & Damai, 2020). The traditional Javanese house has a shape and hierarchy as the social strata formed in the community (Sardjono & Nugroho, 2015). One of them is the Joglo traditional house. In spatial order, generally, the conventional Joglo house is divided into two large parts: *njaba* is the outside, and *ndalem* is inside (Budiwiyanto, 2013; Djono et al., 2012). Then, it is further divided by the configuration of the outside-in axis, *pendhapa*, *pringgitan*, and *ndalem*. On the outside, there is generally a *pendhapa* and *pringgitan*. *Pendhapa* is an open building without a partition that is usually used as a place for social gatherings and celebrations to receive guests that are formal and symbolize the social status of the owner, while the *pringgitan* is generally located between the *pendhapa* and *ndalem*, which functions as a link between the two places (Budiwiyanto, 2013; Ju et al., 2018; Santosa, 2000; Tjahjono, 2002; Utomo et al., 2021; Wibowo et al., 1998). The *ndalem* is the central part of a traditional Joglo house. Generally, it contains three rooms called *senthong*. The *senthong kiwa* (left) and *senthong tengen* (right) are usually used for resting places for nuclear family members and storing essential items (Budiwiyanto, 2013; Djono et al., 2012; Hilba Yoga Pratama & Agung Budi Sardjono, 2023; Santosa,

2000). The *senthong tengah* is usually used as a well-arranged shrine and a tribute to Dewi Sri as a symbol of fertility and prosperity (Budiwiyanto, 2013; Santosa, 2000; Subiyantoro, 2011; Utomo et al., 2021).

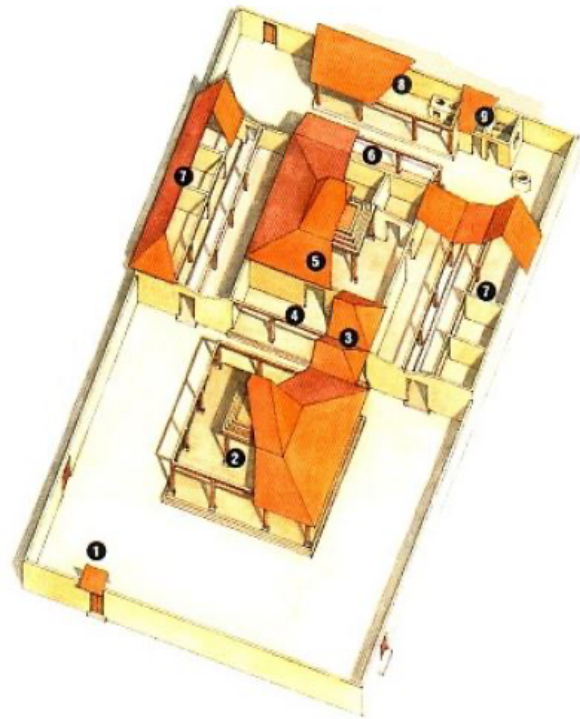


Figure 1. Joglo Traditional Houses
Source: Indonesian Heritage (1999)

2.2 Hierarchy of Needs

The researcher who pioneered the hierarchy of needs theory is Abraham H. Maslow (1908-1970), one of the most famous psychologist scientists of the 20th century (Desmet & Fokkinga, 2020; Kenrick et al., 2010; Koltko-Rivera, 2006). The hierarchy of needs theory explains human behavior and its motivation to fulfill needs until they reach their fullest potential (Abraham Harold Maslow, 1954; Desmet & Fokkinga, 2020; Kenrick et al., 2010; Zavei & Jusan, 2012). Maslow divides it into several levels: the base is physiology needs, safety or psychological needs, social or affection needs, esteem or ego needs, and the peak is self-actualization (Abraham Harold Maslow, 1954; Bridgman et al., 2019; Deci & Ryan, 2000; Desmet & Fokkinga, 2020; Israel, 2010; Jung & Lee, 2023; Kenrick et al., 2010; Soikkeli, 2024; Zavei & Jusan, 2012). The first level in the hierarchy of needs is the psychological basic needs of food, clothing, and shelter. The next level consists of needs, which include physical and psychological security. The third level of needs is belonging, which is related to social relationships with other individuals. The fourth level is self-esteem, which includes individual independence, achievement, and reputation. Lastly, the top level is the need for self-actualization, which includes understanding and developing individuals morally and ethically, which is transcendental.

Four basic levels of needs if an individual does not fulfill their four levels of needs, it will result in not being fulfilled physically and mentally (Acevedo, 2018; Desmet &

Fokkinga, 2020). Meanwhile, if the individual has reached the top level of needs in the form of self-actualization, it means that they have moved towards personal growth based on the other four needs that have been fulfilled (Acevedo, 2018; Desmet & Fokkinga, 2020; Kenrick et al., 2010).



Figure 2. Hierarchy of Needs
Source: Israel (2010)

In fulfilling a need, an individual can go back and forth and does not have to fulfill each level of need to reach the peak (Bridgman et al., 2019; Soikkeli, 2024). The bottom four are called basic deficit needs, while the level at the top is called being or growth needs (Acevedo, 2018; Desmet & Fokkinga, 2020; Soikkeli, 2024). These basic needs are very likely to vary in each individual due to external factors originating from the natural and built environment (Zavei & Jusan, 2012) and allow an individual to reach a certain level of needs without having to fulfill other levels of needs (Soikkeli, 2024).

One of the most essential attributes of an individual is shelter. The shelter is one of the residential levels for humans that protects them so they can do domestic work (Oliver, 2006). In addition, the meaning of a house in the denotative is that it is a physical and visible place to live. At the same time, the understanding of home in the connotative means the symbolism of the residents in it and can reflect the kinship relationship in the household (Oliver, 2006; Zavei & Jusan, 2012). Therefore, compared to shelter, the function of a house is more than just a place to shelter.

As a result, it is essential to understand household needs to create a home condition that is not only physically denotative but can also reflect the kinship relationship in the household. Thus, the house can be regarded as a product of culture and could influence the neighborhood and society (Ju et al., 2018; Oliver, 2006; Soikkeli, 2024). Individuals are encouraged by their needs in the household, which are influenced by the surrounding environment. One of the things that can change according to the needs and users is the house form, including spatial aspects of the house (Ju et al., 2018; Kim & Kim, 2017).

3. Research Method

This qualitative study used the observation method of a sample of traditional Joglo houses scattered in the Kotagede area, Yogyakarta, and in-depth interviews with homeowners. It is assisted by secondary data derived from literature. The selection of Joglo traditional house object samples had criteria including (1) Joglo traditional houses that are still inhabited, (2) at least have space components including *pendhapa* and *ndalem*, and (3) ease of licensing and access for researchers. The literature was reviewed based on established criteria and field surveys about Joglo traditional houses. After the study and compiled sample from the literature, the authors decided on twelve Joglo traditional houses. Field surveys were conducted in June 2024, and field data was collected as physical building data, namely house size and spatial layout. Non-physical data was obtained through in-depth interviews to understand the owner's background, residents' activities, spatial changes, and functions in traditional Joglo houses. The physical data obtained was then processed and analyzed to understand whether or not there were changes in function and space. This was reinforced by information obtained from in-depth interviews—this study combined qualitative with observation and in-depth interviews with Maslow's hierarchy of needs. First, examine and discuss the sample and the owner's background. Second, analyze the spatial transformation that occurred in all samples. Third, the data gained will be combined and integrated with Maslow's hierarchy of needs. This study aims to gain a deep understanding, especially of the things that underlie spatial changes from the perspective of the hierarchy of needs.

4. Results and Discussions

This section will explain the selected houses as the research object and analyze data from field surveys and in-depth interviews. Each sub-section explains each house, including the owner's background and activities, function, configuration, and spatial transformation. The table below contains significant information about the selected houses, including the front photo, location, year of construction, history of ownership, spatial layout, and its transformation and description. The colors in the spatial layout row have three primary colors that generally show the activities and space designation. These are divided into three: light blue for residence and domestic activities, yellow for commerce (economic), and pink for social and cultural activities (social relations).

4.1 Joglo Traditional House 1

Since 1998, the only remaining users are Mr. Sardjono and his wife. In the beginning, in front of the house, there were three shophouses, and then the earthquake in 2006 hit Yogyakarta, making all of them collapse. The owner originally had a silver shop and changed the business model into a small grocery shop. This house is occupied by Mrs. Sardjono and two of her nephews today. The shape of this house is elongated and has an N-S axis, where the primary access in and out is in the south. The spatial configuration of this house has *pendhapa-emper-ndalem*, and on the east side, there is a *gandhok kiwa*.

The *pendhapa* was used for various social activities such

as recitation, social gatherings, and receiving guests. Still, it was converted and is now used for primary access, grocery shopping, and receiving guests. After that, there is the *emper*, which originally functioned as a transition space between *pendhapa* and *ndalem*. In the *ndalem*, there are three *senhong* consisting of *senhong tengen* (west), *senhong tengah* (middle), and *senhong kiwa* (east). At *senhong tengen* and *kiwa*, it was used as a bedroom, and *senhong tengah* was used to store essential items. Today, it is only used at *senhong kiwa*, *ndalem*, and a new bedroom was added to facilitate Mrs. Sardjono. Initially, *gandhok kiwa* had three bedrooms to accommodate Sardjono's children. After 1998, when the children got married, the rooms were demolished, and today, there is an open space used as a kitchen and able to accommodate family belongings. According to Mrs. Sardjono, the current activities are mainly in the *pendhapa*, *emper*, her bedroom, and kitchen. In addition, the *pendhapa* becomes the central area and could be used as a 'barrier' between outside-inside and maintain her privacy as well.

In this case, spatial transformation occurred on the south side, where a shophouse was collapsed and replaced into a parking area due to the 2006 earthquake. If referring to the hierarchy of needs, this kind of need is related to the level of safety needs. Because the owner was worried about the earthquake and its risks, she decided not to rebuild. Furthermore, the *gandhok kiwa* was transformed into a kitchen and open space because it is no longer used, and the residents decreased. *Pendhapa* is the core area of this house because it becomes a transition space between public and private places and is used for most activities. It is shown in several studies that have been carried out that *pendhapa* and or core space is used for various activities (Ding & Ma, 2020; Michelle & Purbadi, 2021).

If we look at the hierarchy of needs, the spatial transformation happened in *gandhok kiwa* due to the disappearance of the residents who filled the space, so there was an underlying lack of psychological and belonging needs at the same time.

4.2 Joglo Traditional House 2

Since 1998, the house has been located in Prenggan, near Kotagede's traditional market. It was built in 1896 and inherited until today. It has never undergone significant renovations and space changes. The shape of this house is elongated and has an N-S axis, where the primary access in and out is in the south. The spatial configuration of this house is *pendhapa-emper-ndalem*, flanked by two *gandhok kiwa* (east) and *gandhok tengen* (west), and it also has a backyard.

Pendhapa is still used mainly for social and cultural events. In the past, the *gandhok tengen* section used to store goods, but now it has changed its function to become a library visited by many tourists. In addition, *gandhok kiwa* is the primary access and functions to receive guests, gather, and eat together. In the *ndalem* section, there are three *senhong*. In the past, *senhong kiwa* (east) and *senhong tengen* (west) were used for the main family's bed, but now they are not used because the number of residents has decreased. The praying room's *senhong tengah* (middle) is still used today. The *ndalem* part was the center of this house when the three *senhong* were still in

use, but nowadays, many domestic activities are carried out in *gandhok kiwa* since Mrs. Ngalim is getting older.

Additional space was added to the south of the *pendhapa* in the form of two bathrooms and one storage room on the library's north side. Two bathrooms were added because of the need for many visitors to this house. In addition, the storage room was added because of the need to store family belongings so that the house looks neat and clean. Based on the hierarchy of needs, the addition of two bathrooms is due to the need for relationships with other individuals, so it is based on self-esteem needs that the owner wants to achieve by providing suitable facilities. In addition, *Gandhok Tengen* is converted into a public library to meet the owner's self-actualization needs because she wants to make part of the house a part of the culture.

4.3 Joglo Traditional House 3

This house was built in 1868 and is located 30 meters on the north Kotagede traditional market. At first, there was a *pendhapa* at the south main house, then sold to other family members, and left main house consisted of *emper*, *ndalem*, *gandhok kiwa* (east), *gandhok tengen* (west), three *senhong* rooms, and backyard. At first, at least more than four residents lived in this house, but now, only a couple remain. The shape of this house is widened and has an N-S axis, where the primary access today in and out are in *gandhok kiwa*. This house looks symmetry with the configuration of *emper* and *ndalem* flanked by *gandhok kiwa* and *gandhok tengen*.

The *emper* or terrace section, from the past until now, is still used as a formal gathering place such as recitations and neighborhood gatherings. At the same time, *ndalem* tends to be used for more formal events and can provide many people such as weddings and family recitations. Three *senhong* used to function, *senhong kiwa* (east) and *senhong tengen* (west), as bedrooms and the *senhong tengah* (middle) served to store essential items and now in the *ndalem* section and two *senhong* have never been used since father and mother-in-law passed away. The *gandhok tengen* (west) section functions as a support room if there are activities or significant events. *Gandhok kiwa* (east) is the primary access and place to receive guests. Initially, next to the *gandhok kiwa* (east), there was one bedroom, and then a partition was added to become two bedrooms because of the need for children, which has lasted until now. The backyard has a kitchen, bathroom, and back door access. Additional space in the form of a warehouse in the west of the kitchen is needed to store cooking utensils and make them neater and cleaner. The rest of the rooms have survived from the past and have not changed until now.

In this case, a spatial transformation occurred on the east and south sides, transforming into a new room. The first is the addition of a sleeping room for children on the east side of *gandhok kiwa* because of basic psychological needs in the form of shelter or space and safety needs because children need psychological safety and privacy, as well as self-esteem needs to be able to develop individual potential and achievement.

4.4 Joglo Traditional House 4

One of the well-preserved Joglo traditional houses in the Alun-Alun village was approximately built since the end of the Java War (\pm 1830). This house was inherited by Mr. Joko's family, who owned a batik craft shop until the 1980s and is now part of managing a heritage village called "Between Two Gates". The majority of the materials on this house are still original, and there has been no significant repair or spatial transformation. The house form is elongated with an N-S axis with primary access on Rukunan Street, as if dividing the house into two but still a single unit.

The *pendhapa* section has always been used for social and cultural activities, both formal and non-formal, such as recitations, workshops, and meetings. On the east side of the *pendhapa*, there is a room that was once used for batik workshops and has now changed its function for PAUD (early childhood education) activities. In addition, there is a garden and kitchen. On the north side of the *pendhapa*, there is an *emper* and two rooms of *gandhok kiwa* (east) and *gandhok tengen* (west). The *emper* or terrace of the house is used to receive guests who are more non-formal. In the past, *gandhok kiwa* was a place to gather and store goods, but nowadays, the two *gandhok* rooms are only used to store goods. In the *ndalem* area, there are three *senhong* rooms: *senhong kiwa* (east), *senhong tengah* (middle), and *senhong tengen* (west). *Senhong kiwa* and *tengen* from the past until now still function as resting places, while the *senhong tengah* is used as a praying room and has a slight height difference from the other two *senhong* rooms. Therefore, in other cases, *senhong tengah* is considered sacred because of different floor heights; even if it is not used for certain activities, it remains holy (Michelle & Purbadi, 2021). The kitchen and laundry room are still in use and have not changed.

In this case, the spatial transformation had not occurred, and only a change of its function in the batik workshop space into PAUD. Therefore, it can be seen that there is an increase in the level of needs from business-oriented batik sellers (self-esteem needs) to social community orientation (self-actualization needs and belonging needs).

4.5 Joglo Traditional House 5

This house was built in 1890 and is famous for its "langgar dhuwur", which has been used for prayer activities by the local community since 2018. Today, this house is inhabited by a family of four people. The owner's family was a cloth merchant and stopped in the 1980s. The house form is elongated with an N-S axis, with the primary access located on the west side of the house. *Langgar dhuwur*-front yard is located on the south side, *pendhapa* adjoining an additional reading room and two bedrooms on the east side, *pringgitan-ndalem* and three *senhong* rooms and *gandhok kiwa* (east).

The *pendhapa* in this house provides formal and non-formal events/activities such as recitation, social gatherings, and stakeholder visits to family weddings. On the east side, an additional reading room and two bedrooms are exclusively for house residents. Previously, in the *pringgitan* section, there was no additional space, but since a few years ago, there have been two additional bedrooms used by the owner's daughter due to privacy

needs. The *ndalem* section is still used only to pass through, and few domestic activities are carried out. *Senhong kiwa* (east) and *senhong tengen* (west) were once used as master bedrooms, but now only the *senhong kiwa* is still functional, while the *senhong tengah* is still used as a praying room. Many domestic activities occur in the *gandhok kiwa* section, such as cooking, gathering, and relaxing.

In the case of this house, the spatial transformation occurred on the east side in the reading room and two bedrooms because the owner needed a special personal space to read and rest. This shows that the owner's needs are at the level of esteem and self-actualization needs. Furthermore, the additional two bedrooms for the owner's daughters in the *pringgitan* are a part of safety and esteem needs because of the need for individual privacy and independence.

4.6 Joglo Traditional House 6

It is located 300 meters east of Kotagede traditional market and was approximately built in 1890 and bought from the previous owner in 2000. Now, this house is inhabited by a couple, and the latest owner is a fabric businessman. This house form has an N-S axis, and initially, this house only consisted of *ndalem*, *gandhok kiwa* (east), and *gandhok tengen* (west), as well as a backyard. Then, after being purchased and renovated, it underwent many space changes.

The owner decided to buy a *pendhapa* located south of the house to accommodate various formal and non-formal activities. On the east side of the *pendhapa*, there is an additional bedroom for the housemaid, which is now empty. The *gandhok tengen* is transformed into various rooms, such as the family room, living room, and bedroom up to the second floor, while the *gandhok kiwa* retains its original shape. The *ndalem* section originally had three *senhong* rooms, but they were removed due to the damaged condition. At the back, the spatial transformation includes adding a prayer room, fabric cutting area, fabric warehouse, and sleeping room for housemaids.

In this house, many spaces have undergone the spatial transformation mentioned in the previous paragraph. The addition of the *pendhapa* is due to the esteem and self-actualization needs based on the owner's need to provide a space that can be used for various activities and as a representation of self to achieve self-fulfillment. Transforming the *gandhok tengen* into various spaces is simultaneously a basic need for safety and belonging. Basic and safety needs for personal space, such as bedrooms and communal space, are related to belonging and socializing with others. The back of the house, mainly used for business activities, can be seen as belonging and esteem needs because it requires space that can support the owner's achievements and, at the same time, the need for socialization with other employees. In a conducted study, *pendhapa* is used to receive guests and for different social interactions, and it also provides a tranquil relationship between others (Michelle & Purbadi, 2021). In this case, *pendhapa* has an important space to utilize as a manifestation of self-actualization.

4.7 Joglo Traditional House 7

This Joglo house is located in Jagalan with an area of $\pm 180 \text{ m}^2$. It was established in the 1900s and is inhabited by a single family. The shape of this house is elongated and has an N-S axis with a spatial configuration of the front yard and *emper* in the south, *pendhapa*, kitchen, *ndalem*, three bedrooms, and backyard.

Initially, in the *pendhapa* section, a *gandhok kiwa* (east) room was used as a resting place. Still, the owner renovated the house to get a wider space so that it could accommodate a variety of activities and residents. Until now, the *pendhapa* has been used to provide a variety of personal, social, and cultural activities. *Ndalem* functions as a gathering and relaxing area. To the north, there are bedrooms for the owner and two daughters

In this case, the spatial transformation occurs only on the *gandhok kiwa* and is removed, leaving only the *pendhapa*. This is due to the need for more space and maximum occupants and activities. When viewed from the hierarchy of needs, this is at the level of safety and belonging needs, the need for socialization with other individuals.

4.8 Joglo Traditional House 8

This Joglo house belongs to Bodon village and is located 300 meters west of Soka Alley. Built in the 1900s and inherited by five generations, this house is occupied by three people today. The owner's family was a furniture entrepreneur and stopped in the 1980s. The shape of this house is elongated and has a North-South axis, where the primary access in and out is in the south. The spatial configuration of this house is *pendhapa-emper-ndalem-gandhok tengen* (west), and it has a backyard.

The *pendhapa* in this house was used as a furniture production place but stopped. It is now used as a waste bank shelter managed by Muhammadiyah. The *emper* functions as a transition area from the outside to the inside of the house and could also provide a space for gathering and relaxing. On the east side, there was a *gandhok kiwa*, but due to the effects of the 2006 earthquake, the space was so severely damaged that it collapsed and was sold to a close relative, which is now just an open space. The *gandhok tengen* room is used for the kitchen and dining room. The *ndalem* section has an additional bedroom for the owner's grandchild to make it more comfortable and safer. Three *senhong* spaces in the *ndalem* area are still used today. *Senhong kiwa* and *senhong tengen* function as bedrooms, while *senhong tengah* stores family belongings. The back area has a backyard and an additional storage room.

Gandhok Kiwa was damaged and then collapsed due to the effects of the earthquake, so the owner decided not to rebuild again due to safety factors. Then, the property was sold to their close relative. This shows that spatial changes other than external factors in the form of earthquakes are due to safety needs based on the safety factors of the occupants of the house. In the *ndalem* area, there is an additional bedroom because of the needs of the owner's grandchild. This action refers to safety needs because it needs physical and psychological security, belonging needs for the grandchild's development with other residents emotionally and socially, and esteem needs for individual growth.

4.9 Joglo Traditional House 9

Still, in the exact location as the previous case, this house is estimated to have been built in the 1900s. Based on information from the current owner, who bought the $\pm 900 \text{ m}^2$ house in 1991, this house used to belong to the tumenggung of Surakarta Sunanate. The owner's family has a business in the form of a jewelry shop, and it is still running today. In the past, this house had a *pendhapa* on the south side, but the current owner sold it due to renovation and maintenance costs. The house has an N-S axis and has a widened and elongated shape, where the primary access in and out is in the south.

The spatial configuration of this house has a front yard, a silver production room, rental spaces, *emper*, *ndalem*, three *senhong* rooms, *gandhok tengen* (west) and *gandhok kiwa* (east), a back yard, and a kitchen. On the west side of the current front yard, the owner decided to build a silver production room, and on the west side, two rooms for rent to increase income and wanted to make the house more crowded. The *gandhok kiwa* was initially used as a resting room but is now used as an employee room. *Gandhok tengen* was originally an open space but was converted and used as two bedrooms for other family members when they visit. The southern part of *senhong tengen* added a small bathroom for the owner to facilitate movement and safety because she is elderly. Lastly, there is a backyard and three bathrooms that have not undergone any functional or spatial changes. In this case, the *ndalem* and back side become the core space because main domestic activities occur and are close to the exterior; thereby, the separation between the inhabitant and society is closer (Ding & Ma, 2020).

The spatial transformation, such as selling the *pendhapa* for renovation and maintenance costs, is included in the safety needs level. Because the owner needs to fulfill financial strength to maintain the Joglo traditional house's legacy and maintain it for a long time. In addition, the addition of space for rent and silver production space is still at the level of safety, belonging, esteem as well as self-actualization related to the family's financial power to be able to meet family needs, the need for relationships and communication with other individuals, independence, and reputation of the owner's family and fulfill family-business legacy's growth. Finally, adding a small bathroom is due to the insistence on safety at the safety needs level because family members are concerned about the mother's safety.

4.10 Joglo Traditional House 10

This Joglo house is about 300m north of Omah UGM, with road access that can only be passed by two-wheeled vehicles. It is estimated to have been built since 1920 and has been passed down from generation to generation. The owner's family had a silver craft business in the past, but it stopped because no one was left to continue. The house's condition is generally good and well-maintained, and space has been added to the eastern part of the house. The house's current occupant is only one person and is visited by relatives at certain times.

In the past, this house had a *pendhapa* in the south and was sold to a close relative. In the past, the *emper* used to receive guests, but now it is used as a transition room. The *gandhok kiwa* (east) area is still a gathering place for formal

and non-formal activities. The eastern part of the *gandhok kiwa* has three bedrooms connected with a connecting door used as a resting place for relatives or families who are visiting. The *Senthong Tengen* used to be used as a bedroom but is currently being converted into a storage room. The *ndalem* section and three *senthong* rooms are presently not used daily except for *senthong kiwa* (east) and *senthong tengah* converted into one, which the owner now uses as a master bedroom because she feels uncomfortable and needs space expansion. In the back, a kitchen, bathroom, dining room, and laundry room were added in 2006. The addition of space is due to increased spatial needs. In addition, at the back, a former space was used for a silver craft workshop, which was dismantled because it had stopped operating.

The spatial changes in *senthong kiwa* (east) and *senthong tengah* (west) were converted into one room because they felt uncomfortable and needed an ample space when viewed from the hierarchy of needs, then at the level of esteem needs that reflect the desire for well-being and individual autonomy. In addition, the silver craft workshop area was converted into open land because it was no longer running a business. It was originally a self-actualization need to be limited to safety needs. This is because if the building is maintained but not used as it should be, it can pose physical and financial threats in the future. Physical threats can come from the age of the building, and financial risk comes from maintenance costs.

4.11 Joglo Traditional House 11

This Joglo house is located about 300m north of Omah UGM. It is located in Soka Alley adjacent to the main access road, Mondorokan Street. It was established in 1880 and has been owned for generations. It is occupied by four family members: the owner, her brother, and her sons, and it has a business in the form of a traditional Javanese noodle seller. The house's condition is fairly well maintained with good condition, facing south with spatial order with an N-S axis in the form of *pendhapa*, *emper*, *ndalem*, three *senthong* rooms, and *gandhok kiwa* (east).

The main access in and out is through the east side, and the secondary is in the west. Initially, an empty courtyard was on the eastern side, but it was sold and converted into a building. Spaces such as *pendhapa*, *emper*, *ndalem*, and three *senthong* rooms are still in use today and have not undergone spatial changes. *Pendhapa* was used for various social and cultural activities such as gamelan and dance but stopped in 2018 because it was converted to selling Javanese noodles. *Senthong tengen* (west) and *senthong kiwa* (east) from the past are still used as bedrooms, while *senthong tengah* has been used as a praying room. The *gandhok kiwa* part, including the additional praying room

and bedroom, is used daily by the younger brother of the house owner to accommodate his activities.



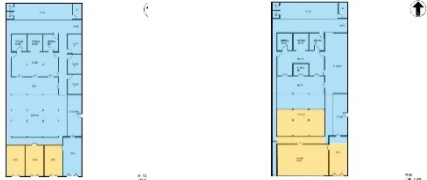
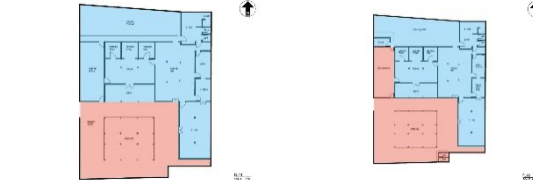



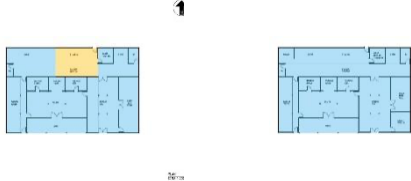
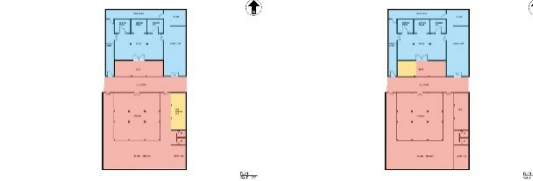

Spatial transformation occurs in the case of this house; the front part in the form of a front yard becomes a building because of family needs, so this is at the level of safety needs. In addition, there is a praying room and bedroom in *gandhok kiwa* because of the wishes and needs of the younger brother. This is at the level of safety, belonging, and esteem needs, as well as safety needs because the younger brother needs physical security and belonging. After all, he still lives in one house with other members. Hence, he needs a connection with other individuals, and the space can fulfill his esteem needs because it is crucial for his psychological well-being and optimal functioning.



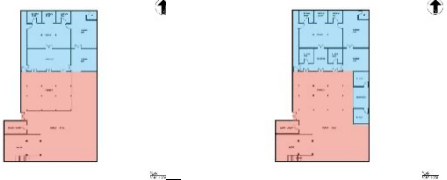
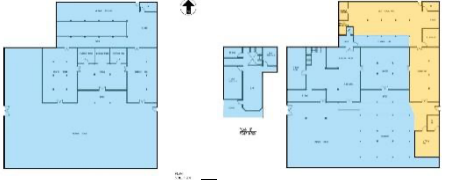



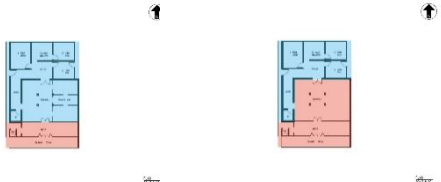
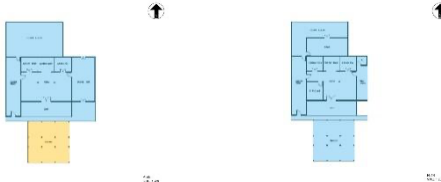

4.12 Joglo Traditional House 12



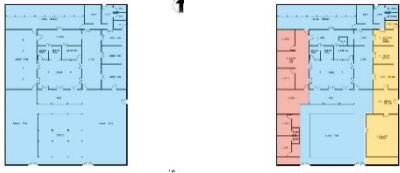
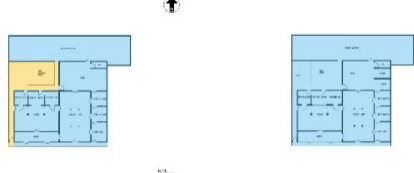



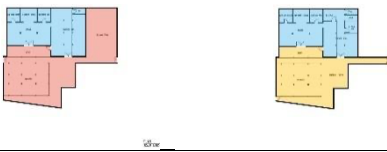
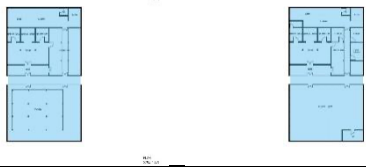

This last Joglo house is included in the Krintenan village area. It has an area of $\pm 350 \text{ m}^2$ and was bought by the current owner in 1995. The house faces south with a spatial order of N-S axis, including the *emper*, *ndalem*, three *senthong* rooms, *gandhok kiwa* (east), and kitchen. The house owner has a business in the form of home catering done by both (husband and wife), which stopped in 2019.

There used to be a *pendhapa* in the south, but it was damaged by the 2006 earthquake and decided to be demolished and not rebuilt until now. It has become a field with an additional bathroom. In *senthong tengen* (west), there is an extension space to the north to increase the area of space that was previously used for elderly resting places and is now unused. Likewise, the *senthong tengah* (middle) and *senthong kiwa* (east) were once used to store goods and bedrooms. *Gandhok kiwa* is the central space because many domestic activities are carried out, such as telling stories, gathering, receiving guests, and resting. Since buying the house, additional rooms have been added, such as a bedroom and praying room. Since adding these rooms, the *ndalem* and three *senthong* rooms have not been used anymore. Then, there is a kitchen, storage room, and toilet at the back.

The addition of space in the form of a bedroom and praying room in *gandhok kiwa* resulted in spatial transformation based on safety, belonging, and esteem needs at once. Safety needs are needed because the owner feels the need for physical security in the form of space that covers the surroundings, belonging needs are needed to feel adequate in one's interaction with the surroundings, and esteem needs are needed to maintain individual autonomy and growth. Converted the *pendhapa* into the front garden due to safety considerations as the condition was already severely damaged to avoid the building collapsing due to the effects of the earthquake.

Table 1. Spatial Transformation on Joglo Traditional Houses			
	House 1	House 2	
Front Photo			
Owner	Mr. Sardjono	Mr. Ngalm	
Location	Prenggan, Kotagede	Prenggan, Kotagede	
Year of Construction	± 1922	± 1896	
History of Ownership	Purchased in 1950, Inheritance	Inheritance	
Spatial Layout and Transformation			
Legend			
Description	Economic business activities are focused on the southern part of the shophouses.	After the transformation, the space and activities economically occupy half the <i>pendhapa</i> area and the front yard.	The house is divided into two patterns of activities and designations in general: domestic and social & cultural activities.
		After the transformation, space, and activities socially fill the <i>gandhok tengen</i> area.	
	House 3	House 4	
Front Photo			
Owner	Mrs. Yuwanti	Mr. Joko	
Location	Prenggan, Kotagede	Purbayan, Kotagede	
Year of Construction	± 1868	± 1830	
History of Ownership	Inheritance	Inheritance	
Spatial Layout and Transformations			
Legend			

Description	Economic business activities are focused on the northern part of the house.	After the transformation, there is no longer any economic activity.	This house is divided into three general patterns of activities and designations: domestic, economic, social & cultural.	After the transformation, the place for business activities shifted to the <i>emper</i> section.
	House 5		House 6	
Front Photo				
Owner	Mr. Charis		Mr. Jayari	
Location	Purbayan, Kotagede		Purbayan, Kotagede	
Year of Construction	± 1890		± 1890	
History of Ownership	Inheritance		Purchased on 2000	
Spatial Layout and Transformations				
Legend				
Description	The situation before, was only divided into domestic and social activities.	After the transformation, the domestic activity space increases in the eastern part of the house	In its previous state, the house was divided into only domestic activities.	After the transformation, it is divided into domestic activities in dominant and business activities.
	House 7		House 8	
Front Photo				
Owner	Mr. Eko		Mrs. Trisyani	
Location	Jagalan, Kotagede		Purbayan, Kotagede	
Year of Construction	± 1900		± 1900	
History of Ownership	Inheritance		Inheritance	
Spatial Layout and Transformations				
Legend				

Description	The situation was divided into domestic and social activities.	After the transformation, the domestic activity space is concentrated in the north and west.	Before, the house was divided into domestic and economic activities.	After the transformation, economic activities disappeared and converted into domestic activities.
	House 9		House 10	
Front Photo				
Owner	Mrs. Sri		Mrs. Jazilah	
Location	Jagalan, Kotagede		Purbayan, Kotagede	
Year of Construction	± 1900		± 1920	
History of Ownership	Purchased on 1991		Inheritance	
Spatial Layout and Transformations				
Legend				
Description	In its previous state, this house was only a place for domestic activities.	After the transformation, it is divided into domestic, economic, and social activities.	Before, the house was divided into domestic and economic activities.	After the transformation, economic activities disappeared and converted into domestic activities.
	House 11		House 12	
Front Photo				
Owner	Mrs. Nunuk		Mr. Sutanto	
Location	Jagalan, Kotagede		Purbayan, Kotagede	
Year of Construction	± 1880		± 1900	
History of Ownership	Inheritance		Purchased on 1995	
Spatial Layout and Transformations				
Legend				

Description	The house was divided into domestic and social activities in its previous state.	After the transformation, it is divided into domestic and economic activities.	In its previous state, the house was divided into only domestic activities.	After the transformation, there is no change
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5. Conclusion

In general, in all cases, spatial transformation is influenced by the level of needs from the bottom-up and reciprocal. This means spaces are transformed based on basic, safety, belonging, and esteem to self-actualization, from the lowest level or vice versa, so it does not always depart from the bottom to the top.

This is shown in nine cases, with visible changes in *gandhok kiwa* and *gandhok tengen* based on safety and esteem needs. Its transformation tends to be used in relation to individual activities and social interaction. In the other three cases, there are changes in personal spaces, such as bedrooms and *pendhapa* based on self-actualization and basic needs, which tend to be used in connection with individual and commercial activities.

In the five cases of Joglo houses, the spaces that are transformed and then used for commercial activities economically tend to be based on esteem and self-actualization needs. This is based on the activities of users who previously had a business or background of an entrepreneur. In another five cases, the transformed spaces are used for social and cultural activities based on belonging, esteem needs, and self-actualization. In contrast, in two Joglo houses, the spaces transformed or converted into personal spaces tend to be based on fundamental and safety needs. The transformation is based on a family background that has influence and willingness to maintain their Joglo house as a social attraction.

Although each household's needs differ, the owners try to maintain the legacy of Joglo houses that symbolize prosperity and social rank. The absence of massive changes in the facade and spatial layout can show this. Besides that, the homeowners still maintain spaces that are considered essential, such as the *ndalem*, *senthong*, and *gandhok* sections, which are some of the characteristics of the spatial arrangement of traditional Joglo houses. Furthermore, in most of these cases, the *pendhapa* section is converted into a space that functions for social and commercial activities that tend to be based on belonging to self-actualization needs. In addition, it can be seen from the background of Joglo house owners who mostly have businesses and/or respected families. Therefore, with spatial transformation, Joglo houses can still meet the needs of users/residents to the level of self-actualization.

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