The dynamics of the factory function as a production room at the house of clothing artisans in Pekalongan

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Abstract. Technological innovation provides many business opportunities (technopreneurs) that involve various fields of study. Architecture is not an exception; technological advances can create a "hi-tech" masterpiece. There are two fields of study related to the application of architectural technology. First, the use of technology to improve the quality of architectural products, so that the design results are considered to be able to keep up with the times, such as materials and technological elements. Second, a form of architectural preservation that can be used as a guide in following technological developments, such as spatial planning. During the Diponegoro War some of his followers were forced to leave Mataram, then those who stopped in Pekalongan began to introduce batik in three areas: Wonopinggo, Pekajangan, and Buaran in 1825-1830. Gradually, batik production increased, until it is expanded into weaving craft. Both types of clothing production can’t be separated from technological advances, handmade batik is replaced with stamped batik, and the weaving of ATBM production changes to using ATMs. The historical journey that transformed Pekalongan as a well-known clothing city in Indonesia is interesting to study, especially in the architectural field, namely spatial planning formed from local culture. This study discusses the spatial preservation of clothing production houses in three areas in Pekalongan, namely: Pekajangan, Kauman, and Pesindon. The objective of the study was to identify the form of spatial preservation used during the development of clothing-making technology. Descriptive-exploratory research method is used to explore elements of local wisdom used as guidelines for spatial planning. The results of the study elaborate that the layout of the clothing production house in Pekajangan, Kauman, and Pesindon consists of: living room, family room, drying room, and factory. However, there are differences in the location of the drying room. This difference is due to the change in function from residential building to production building, and also from the development of clothing technology. This requires some additional spaces. Based on the research results from the three areas, the factory is a long-lasting and sustainable space category.

1. Introduction
The increase of the clothing market in Pekalongan City cannot be separated from the technological advances and the development of the economic area, so it has an impact on the expansion of production areas. The existence of clothing production which started from batik has been known by the people of Pekalongan since the 1800s. Gradually, batik craft became a new trend, and began to grow in these three areas, Wonopinggo, Pekajangan, and Buaran. The journey of increasing batik production was accompanied by the growth of weaving crafts. Therefore, it has to do with the changes in production for some batik makers who switch to weaving. However, the presence of woven crafts is not reducing the
growing of batik production. On the other hand, the two products grow together coloring the hustle and bustle of the clothing market in Pekalongan. Along with technological advances, encouraging innovations in tools and clothing production such as hand-drawn batik into stamps, and the weaving of non-machine weaving tools (ATBM) production changed to using machine weaving tools (ATM).

The history of the growth and development of clothing in Pekalongan within a period of two centuries certainly left artifacts. Artifacts that were born from culture and had a physical form were the result of architectural works. An architectural form that can accommodate the ongoing cultural activities in an environment in the form of a room. The room formed by the “clothing society” culture in Pekalongan functions as both a residence and a production area. Therefore, the room structure becomes patterned due to the existence of two activities at once.

The growth of clothing production is expanding to form a linear trade corridor from the southern region, Pekalongan Regency, to the northern coastal area of Pekalongan City. Likewise, the spatial layout used in production houses in several areas in the Pekalongan clothing trade corridor. The spatial layout formed from the culture of the clothing community is arranged based on production activities and adapted to the new environment in the expansion area. Despite technological advances in the production of clothing, the producers have not changed the layout used in their production houses. The producers maintain the layout formed from their predecessors.

The research was conducted at batik and weaving production houses in three separate areas, Pekajangan Batik Village, Kauman Batik Village, and Pesindon Batik Tourism Village, which is the center of Pekalongan's clothing craft. Each of these areas has the same spatial layout, formed from the existence of clothing production activities, such as: living room, family room, drying room, and factory. The formation of spatial planning in the three areas occurs continuously. Thus, it is interesting to study the dynamics of the spatial function.

2. Review of The Related Literature

Culture can be interpreted as the result of human activities, such as reason, customs, beliefs, and arts [1]. Humans and culture are a unity, because the supporters of culture are humans themselves [2]. While the scope of culture itself is very broad, Peterson and Anand [3] divided this term into several elements, such as: 1). Religious systems and religious ceremonies, 2). Community systems and organizations, 3). Knowledge system, 4). Language, 5). Arts, 6). Livelihood system, and 7). Technology and equipment. Furthermore, Koentjaraningrat stated that there is only one strong element of culture, highlighting the distinctive nature and quality to become the main element of Indonesian National Culture, which is called art. The arts are divided further into visual arts, sound arts, dance arts, and drama arts.

One of the artistic products that can be a characteristic of an area is batik. Batik means a pictorial cloth made specifically by writing or applying wax to the cloth, then the processing is processed through certain stages and methods [4]. The stages of making batik include three main processes as follows: fabric processing (ngemplong), patterning, and batik processing. The traditional batik process is done by painting the wax on the cloth using a painting canting (a tool used to move or take a typical liquid used to make batik), and the product is called hand-drawn batik. While the modern ones are made using stamps canting, and the products are known as stamped batik. Another type of art is weaving, which is the process of making cloth from crossing two sets of threads. This is done by inserting the weft across the warp threads. Previously, the weaving was carried out, namely the installation of the warp threads parallel to the desired width, this process was carried out using a loom. Like batik, as technology advances, weaving can be done in the traditional way using non-machine weaving tools (ATBM), as well as machine weaving tools (ATM) in modern times.

The economy which brings a necessity in social life is formed from culture as a product of human work. The increase in economic needs eventually led to the concept of home and work. This concept can be implemented through Household Based Enterprises (UBR). UBR is a product of human technology, because in this case the house becomes a mean (tool), as well as a goal to meet economic needs in a household [5]. The main characteristics of UBR are 1). Households are the basis of economic activity, 2). The family becomes the main actor and the main force of the activity, 3). In this case, the
The condition of the house will adjust to the activities held, and 5). If a conflict occurs in production activities, it can be resolved naturally, both internally within the house, and with the environment. The location of the room as a place of activity will greatly affect the economic situation and condition. The determination of the place for UBR activities must be considered so that there is no conflict between the family room and the production organization. So that the allocation of the room can be done by way of additions for certain functions, either mixed or separated. The room as a container of culture is part of architecture. To unite humans with their environment, architecture acts as a bridge to create harmony [6]. It is revealed that the quality of architectural layout produced by architects must meet the following criteria: 1). The room must be able to provide freedom of movement, activities according to its function, comfortable, and on a human scale, 2). Can give meaning to the users of the room, simple, not necessarily grand, and in it form a harmonious activity, 3). The resulting room can form the identity of the local architecture, meaning that it is in accordance with the culture in the environment, 4). The resulting room is sustainable, durable, timeless, and permanent and can accommodate social activities [7].

Veresov [8] defined that the notion of architecture is not just a structure and form that grows because of cultural phenomena, but also the dynamics that occur in the conditions of a society. Therefore, preservation of architecture should not only be carried out on traditions that produce form and spirit. But more to the spirit and strength of a certain environment, which is called the term local genius. In architecture, local genius will grow and be sustainable if we can respond to it with local wisdom [9]. Local wisdom is all forms of knowledge, beliefs, and customs that grow and guide human life in an ecological society [10]. Furthermore, Keraf gives several characters about local wisdom, namely: 1). Local wisdom belonging to the community, 2). It is the wisdom (responsiveness) of humans in an ecological society, 3). Holistic, comprehensive, 4). The existence of local wisdom can shape moral character, and 5). Local wisdom only applies in a certain environment that forms the identity of a place.

### 3. Object of The Study and Methodology

The research method used is descriptive-explorative. It is conducted by means of field surveys, recording the results of observations, interviews to obtain accurate information about the object of the research. Then the data that has been obtained is studied descriptively to obtain the research objectives.

The research was conducted in Pekajangan Batik Village, Pekalongan Regency, Kauman Batik Village, and Pesindon Batik Tourism Village, Pekalongan City. The three areas are the growth centers of the large clothing industry in Pekalongan, which have the same spatial layout in their production houses. Location of the study is given in Figure 1.

### 4. Result and Discussion

#### 4.1 Development of Clothing Production in Pekalongan

4.1.1 The rapidity of hand-drawn batik in Pekajangan. The widespread growth of hand-drawn batik in Pekajangan can improve the trade. Batik developed rapidly and the economy was getting better, which then gave the rise to a hierarchy in society such as priyayi and workers. Pekajangan's hand-drawn batik began to develop around the 1950s, thus giving birth to a series of batik figures whose names began to be known by the public because of their success in developing their business. It was at that time that architecture began to grow to complement the cultural phenomenon in Pekajangan. Many houses are spatially designed to accommodate batik activities. So that in almost every house in Pekajangan there is a factory to develop the production of hand-drawn batik. Figure 2 illustrates production process of batik.
4.1.2 The Growth of the Weaving Industry in Pekajangan. There is no official record of the presence of weaving in Pekalongan. However, the growth of the weaving industry in Pekajangan started after the heyday of batik production. The entry of the weaving industry in Pekajangan at that time affected some batik producers who then replaced the batik business into weaving. The growth of weaving does not mean to dampen the batik producers, but the two entrepreneurs are developing together to enliven the clothing trade in Pekalongan. Weaving in Pekajangan is done traditionally using ATBM or ATM.

Like the producers of hand-drawn batik, weaving entrepreneurs also use factories in the design of their production houses. For new entrepreneurs, they design their production houses following the designs of batik producers. Meanwhile, for those who experienced the transition from batik to weaving, they only transferred the function of the factory to the weaving business. So that the dynamics of the factory function as a production room.

4.2 Expansion of the Clothing Production Area through the Batik Corridor. The path of growth and development of the clothing industry in Pekalongan (the batik corridor) crosses from the south, Pekalongan Regency, starting from Wonopringgo, passing through Pekajangan, Buaran, to the north...
coast of Pekalongan City. Then in Pekalongan City, it is divided into two rapidly growing areas, namely Kauman and Pesindon. Batik corridor in Pekalongan is given in Figure 3.

![Figure 3](image3.jpg)

**Figure 3.** Batik Corridor in Pekalongan

Kauman Batik Village is located in Kauman Village, East Pekalongan District, Pekalongan City. Because it is an expansion area, so that the growth of the production house adapts to the existing environment, after growing rapidly it was inaugurated as "Kampung Batik Kauman" in 2007. Meanwhile, Kampung Batik Pesindon is located in Kergon Village, West Pekalongan District, Pekalongan City. As similar as Kampung Batik Kauman, the growth of production houses here also adjusts to environmental conditions. Following Kauman Batik Village, this area was finally inaugurated as "Pesindon Batik Tourism Village" in 2009. Figure 4 shows gate of Kauman Batik and Pesindon Batik while Figure 5 shows process of making batik cap.

![Figure 4](image4.jpg)

**Figure 4.** The Gate of Kauman Batik Village and Pesindon Batik Tourism Village

![Figure 5](image5.jpg)

**Figure 5.** The Process of Making Batik Cap Kauman in the Factory

The two batik villages have experienced advances in clothing technology, so that their production is in the form of stamped batik, although some are written. The locations of the two batik centers are opposite each other, only separated by the Kupang River which flows through Jalan Hayam Wuruk in Pekalongan City.
4.3 Spatial Planning and Dynamics of Factory Functions as Production Space

4.3.1 Layout Pattern of Production Houses in Pekajangan Batik Village. The rapid batik trade in the 1950s was followed by weaving, which eventually led to the development of a production house designed based on economic needs, namely the clothing business. In this case, there is a mixing between household activities and production (intersection), this situation is an implementation of the concept of work house. Where the family is the main driver in production activities that are in one house. The layout of the production house in Batik Pekajangan Village consists of: living room, family room, drying room, and factory. The living room is used to receive guests, both business and relatives, the family room functions as a communal place between family members. The clothesline is used for drying during the batik and weaving processes, and the factory is the main place that functions as a production room. Layout of production house in Pekajangan is given in Figure 6 while layout pattern in Pekajangan is given in Figure 7.

Figure 6. The Layout of a Production House in Batik Pekajangan Village

Figure 7. Layout Pattern of Production House in Pekajangan Batik Village

The layout design is arranged permanently according to the capacity that can accommodate all activities from the production process to sales. So that users can freely carry out production activities, the aim is to facilitate the economy at home. Because Pekajangan Batik Village was the first clothing center area to develop rapidly, the design eventually became the pioneer of the layout planning in the Pekalongan clothing production house.
4.3.2 Layout Pattern of Production Houses in Kauman Batik Village and Pesindon Batik Tourism Village. Kauman Batik Village and Pesindon Batik Tourism Village are expansion areas for the development of the batik industry in Pekalongan City. In contrast to Pekajangan Batik Village, which has already prepared the spatial design of its house for production activities, the Kauman Batik Village and Pesindon Batik Tourism Village are more in the form of new environmental adjustments. This means that the existing production house layout is a continuation of the pioneer, Pekajangan Batik Village, to be adapted to the local environment. Starting from a residence to have a household, then batik came, so that business activists adjusted the layout design. So there are some additional rooms, namely factory and drying. The addition is in accordance with the space allocation for the type of UBR. For the placement of factories, entrepreneurs adjust the conditions in their homes horizontally. However, due to land limitations, as well as adjustments to the environment, the addition of a drying room is vertical in the attic. So basically the spatial layout in Batik Kauman Village and Pesindon Batik Tourism Village is the sustainability of the production house in Pekajangan Batik Village, it's just an adjustment to the environment in its design. Figure 8 shows layout of production house in Kampung Batik Kauman.

![Figure 8. The Layout of a Production House in Kampung Batik Kauman](image)

(1). Living room, usually there is a showroom (2). Family Room, in the form of a corridor (3). Factory, space used for the main process of batik (4). Drying Room, located in the attic.

The layout of the production house in Kampung Batik Kauman and Kampung Batik Pesindon consists of: living room, family room, factory, and drying area. The living room is used to receive guests, usually there is a batik showroom, because it is also used for buying and selling transactions with business relations. The family room functions as a communal place between family members, and in it forms a corridor leading to the factory. The factory as the production room is located at the back, while the drying room is in the attic. Kridarso and Iskandar [11] found that there were similarities and differences in the spatial observation pattern of the object of the Central Java Vernacular spatial pattern, which is due to variations in economic and social factors. Widyasari et al. [12] revealed that centralized layout allowed the values of traditional society, sharing and cooperating, maintained in the process of batik. Kridarso [13] found many similarities in the pattern of productive layout of batik houses in Pekalongan and Lasem. Figure 9 shows layout pattern of production houses in kauman batik village and pesindon batik tourism village.
Figure 9. Layout Pattern of Production Houses in Kauman Batik Village and Pesindon Batik Tourism Village

5. Conclusion
Based on the results of the study, it can be concluded that the layout of the production houses in Batik Pekajangan Village, Kauman Batik Village, and Pesindon Batik Tourism Village have: Living room, family room, and drying room. However, there are differences in the location of the drying room. The difference in the location of the drying room is due to a change in the function of a residence to a production, and the development of clothing technology. So there is an additional room. The layout design of the clothing production house in Pekalongan shows a harmonious architectural identity. Can preserve the existing architecture and local genius. From the results of layout planning research in the three areas, the factory is a sustainable and sustainable room category.

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