Application of the adaptive re-use concept in historical building (case study of cigarette factory Gunung Kedu and cigarette factory Gunung Kelapa enterprises residence)

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Abstract. Cigarette Factory Gunung Kedu and Cigarette Factory Gunung Kelapa are kretek industries owned by the Atmowidjojo family. This family has a big role in the economic progress of the Kudus Kulon community. This role can be seen in the large number of jobs provided for the surrounding community. Physical relics that are still intact to date are; Atmowidjojo's house, Nadirun's house, office, and Gunung Kedu factory. Buildings that have historical value are important elements in the development of the city area, as the identity and image of the city. However, at this time the awareness of the public and the government regarding the preservation of buildings is quite lacking. The phenomenon that occurs in the Kudus Kulon area at this time is that many historical buildings belonging to the community are sold and torn down. Sales and demolition of buildings due to the high cost of maintaining historic buildings. Based on this importance, it is necessary to apply the concept of adaptive reuse as a sustainable step in preserving buildings that have historical value in Kudus. The purpose of this research is to study the steps for the sustainability of the application of conservation in buildings that have a history, with building conditions that are still suitable for use. The method in this research uses descriptive qualitative using a case study approach.

1. Introduction
The beginning of kretek cigarettes into a promising commodity in Kudus occurred in the early 1908 century. There are several segments of pioneering companies in the kretek cigarette industry, these segments are divided into large, medium, and smallscale companies. Large-scale industrial companies include the cigarette industry owned by Niti Semito (Tjap Tiga Ball), HM Muslich (Teboe dan Jagung), Atmowidjojo (Gunung Koeu), and HA Ma'roef (Djambu Boll) [1]. Evidence that Atmowidjojo became a large-scale kretek industry entrepreneur can be seen in the number of employees who reach six thousand people. Atmowidjojo's success in running the kretek industry was passed on to his sons and daughters. The names of Atmowidjojo's subsidiaries and their companies are as follows; (1) Ashadi (Cigarette Factory Delima); (2) M. Sirin (Cigarette Factory Garbis); (3) Nasidjah (Cigarette Factory Guntin Potong); (4) Zulkaenah (Merico); (5) Nadirun (Cigarette Factory Gunung Kelapa); (6) Rusjdi (Cigarette Factory Sogo Ogo). Several of Atmowidjojo's subsidiary companies have succeeded in becoming large-scale cigarette companies, namely Cigarette Factory Delima, Cigarette Factory Garbis, Cigarette Factory Gunung Kelapa, and Cigarette Factory Sogo Ogo.
The presence of the kretak industry provides economic changes for the Kudus community and the wider community. Industrialization is a process of transitioning the composition of society that is able to change its position from an agrarian society to a society that provides raw materials or finished goods [2]. The kretak industry employs a lot of workers who come from local residents to rural areas. The tobacco agricultural sector, as the main raw material for kretak cigarettes, also has a positive impact with the large demand for tobacco needed by the kretak industry. Improving the welfare of farmers and employees of the kretak industry can be seen from the income used for the pilgrimage, building luxury homes, establishing public facilities [3]. Changes in the community's economy create socio-cultural changes, these changes which ultimately change the architecture of settlements in the area. The house as the main element of a settlement is the result of the joint work of the community which in its physical expression is strongly influenced by the socio-cultural factors of the community [4].

The low public awareness of heritage conservation can threaten the existence of historic buildings in Kudus [5]. Existing phenomena related to the low level of awareness of building preservation are; (1) Sale and transfer of Kudus traditional house; (2) Sales of indisch buildings; (3) Demolition of the indisch building. The traditional house of Kudus Regency is a joglo house with a knockdown structure system, making it possible to sell the Kudus traditional house outside the region to abroad. Many historical buildings have been sold and abandoned because these buildings require a high level of maintenance. According to the Head of the Culture and Tourism Office of Kudus Yuli Kasiyanto, the decrease in traditional houses is due to the high cost of maintenance. Because they can't afford it, the owner chooses to sell the house whose status is family inheritance.

Based on the significance of the legacy buildings that have a history in Kudus, it is necessary to take sustainable conservation steps in buildings that have historical values in Kudus, one of which is the concept of implementing adaptive reuse. Adaptive re-use is a step to rebuild old buildings for new functions. Adaptive re-use is an economical way to save heritage buildings, generally there are major changes in this process, especially changes in the organization of the interior space [6]. The results of this study are expected to be able to be applied to historical buildings in Kudus.

2. Literature Review

2.1 Adaptive Re-use. The concept of Adaptive re-use is one of several stages in an effort to sustain building conservation. Building conservation activities in maintaining building components are classified into 7 levels, namely: (1) preservation; (2) restoration or restoration; (3) strengthening or consolidation (4) rearrangement or reconstrititution; (5) new use or adaptive re-use; (6) rebuilding or reconstruction; (7) the creation of twins or replication [6]. This activity is carried out as a stage to protect historic buildings, by adapting from old functions to new functions that are beneficial to the community [7]. Adaptive re-use is carried out when the condition of the historic building is no longer suitable for its use, due to technological developments, regulations, and economic progress. It is therefore, adaptive re-use is considered as the right step as a sustainable strategy for building reuse [8]. Adaptive re-use is described as a process in which structurally, buildings with old functions are developed into new functions that can accommodate needs and increase economic value [9].

2.2 Kudus Traditional House. Kudus traditional house is a typical house that was born from the culture and intelligence of the sacred community. The traditional house of Kudus has a background that is also different from traditional Javanese houses in the interior, both in the shape of the roof as well as in the organization and elements. One of the factors that causes the traditional Kudus house to have its own uniqueness, namely the full carvings on the elements of the house [10]. The typical concept of this house is guided by Javanese cosmology which can be interpreted as a house as a housethe macrocosm of the microcosm (the inhabitants). This concept has the meaning of everything related to the embodiment of the house, designed and treated using certain rules or guidelines, which reflect that view [11]. The following are examples of some Javanese cosmologies that are applied to
the layout of the Kudus traditional house; (1) Jogosatru is the name of the front part of the Kudus traditional house. The meaning of the word jogosatru is jogo means guarding and satru means enemy. Every day this room is used as a place to receive guests. Inside this room there is a pillar called Soko Geder, which symbolizes the one God and reminds its inhabitants to always have faith and piety to Him. This pillar has more symbolic meaning than a construction function [12]; (2) Régoł means a small house in the form of a door that functions as a gate/entrance to the home environment. In terms of the existence of these components, the occupants of the house are expected to have a good leadership spirit like the ancestors/people who have power [13]; (3) Pakiwan as a symbol for humans to clean themselves both physically and spiritually. The Pakiwan are in the form of wells, bathrooms [12].

2.3 Indisch House. Indisch empire style is a typical house that has a blend of empire style building styles brought by the Dutch with adjustments to existing conditions in Indonesia. The word Indisch comes from the Dutch language "Nederlandsch Indie" or the Dutch East Indies, which is the name of the Dutch colony across the sea which geographically includes colonies in the archipelago called Nerlandsch oost Indie [14]. Indisch houses are directed at buildings that have a mixed form of Nusantara architecture and modern architecture, building materials, climate and technology that developed at that time [15]. Adjustment of building elements in Indische houses serves to anticipate the rainy and summer seasons. The rainy season is anticipated by how the house can respond to rainwater tampias, while in the summer how the house can create thermal comfort, considering that the air temperature in Indonesia is higher than the temperature of Europeans.

3. Research Methods
The method used in this study is a qualitative method. The approach method chosen in this research is a case study, with the case of the houses of Cigarette Factory Gunung Kedu and Cigarette Factory Gunung Kelapa. A case study is a research design found in many fields, particularly evaluation, in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals. Field studies are carried out by means of; (1) Observation of direct visits to the homes of Cigarette Factory Gunung Kedu and Gunung Kelapa; (2) Documentation to obtain information on the size of the building area and taking photos of the existing building, while interviews were conducted with several historians who were then validated with the heirs of the object under study. The purpose of the observation is to find out what parts can be maintained and used and how to respond to the constraints that exist in the object of this research. The literature study was conducted to obtain historical data on the kretek industry in Kudus, study of the traditional house of Kudus, study of indisch houses, study of building conservation, and study of adaptive reuse. The results of the research are intended to obtain data that will be used as literacy for people who have historical buildings that do not function.

4. Results and Discussion

4.1 History of Pioneer kretek Cigarette Industry in Kudus. The cigarette industry was first established in 1908 by Niti Semito under the Tjap Tiga Ball brand. Niti Semito's success in building this industrial business has a positive impact on the surrounding community. The impact that is felt is the number of jobs that result in an increase in the standard of living of the community. Not long after Niti Semito founded the kretek industry, many people finally decided to co-found this industry, some of whom were the Atmowidjojo family, HM Muslich, and HA Ma'roef.

The history of the distribution of the holy kretek cigarette industry is centered in the Kudus Kulon area. This area comes from the name Region which is west of the Gelis river. At the present time, Kudus Kulon has become the centre of religion and tourism in Kudus Regency. This area has a thick history and culture, both tangible and intangible. One example of a tangible historical heritage in this area is the Menara Mosque, a legacy of Sunan Kudus. Sunan Kudus is a figure in the spread of Islam
in Kudus Kulon. The local community has a gusjigang philosophy of life, which means reading the Koran and trading. Gusjigang is a mandate given by Sunan Kudus to the local community. The application of this gusjigang has finally made the Kudus Kulon community known as an area for students and business people. Prior to the large number of kretek industry business players in this area, the majority of the livelihoods of the Kudus Kulon community were as food traders and jewellery traders. The following is a map of some of the distribution points of the kretek industry entrepreneurs' houses in Kudus Kulon (figure 1). This distribution is proof that Kudus Kulon is the centre of the creation of the kretek industry.

Figure 1. Map of the Distribution of Houses of kretek Cigarette Industry Entrepreneurs in Kudus Kulon

4.2 Adaptive Re-use Gunung Kedu Cigarette Factory House. Case one (1) adaptive re-use of the Gunung Kedu Cigarette Factory house, is a case of a house that requires high maintenance costs. The high cost of maintenance is because this house has a large area and requires special care. One example of special care that is carried out is by lubricating tobacco soaking water to all parts of the house that have wood materials. This needs to be done at least once every 6 months to 1 year, one of the factors is to avoid termites. These factors have resulted in many people wanting to sell or tear down joglo houses.

In the scope of business, the location of Atmowidjojo's house and factory is included in the strategic category. The house is located around the main road of Sunan Kudus, to be more precise, it is south of the Menara Mosque. This road has a high intensity of use, because this road is a connecting access between the City of Kudus and the City of Jepara and as a religious centre in Kudus. In terms of business this road has advantages, namely; (1) Ease of supplying cigarette raw materials because at that time only certain roads had a fairly large road width; (2) Ease of supply of products to be marketed outside the city because the road is a connecting road between cities; (3) Ease of marketing the products to the surrounding area because the area is a religious centre.
The current ownership status of the Gunung Kedu house has been handed down to Dodi bin Rusjdi. The existence of this house was originally passed down from Atmowidjojo bin Troenodwongso to Rusjdi bin Atmowidjojo, which was later passed down to Rusjdi's youngest son, Dodi bin Rusjdi. This house was established not long before Atmowidjodjo founded the kretek industry, namely before 1913. In accordance with the culture in Kudus Kulon, the house will be given to the youngest child. It can be stated that the status of this house has changed hands with three different generations, with a period of 107 years. Figure 2 shows the Indisch and Joglo houses owned by the Atmowidjojo.

![Figure 2. Indisch House and Joglo House, Owned by Atmowidjojo](image)

Architecturally, the uniqueness of this house is that it consists of several separate buildings with two different styles. The two styles, namely the joglo house style and the indisch house. These two building styles were built at different times. The time of the establishment of the joglo house after Atmowidjojo experienced success in the kretek cigarette industry business, while the indich house was Atmowidjodjo's first home. The uniqueness of the physical system of this house is still intact until now. The integrity of this house can be seen in Figure 2. In Figure 2 it can be seen that the Joglo house is still intact from ornamentation to building materials.

The decision to make the house as a place for the textile business Muslim clothing is a sustainable step for building conservation in maintaining the house. This decision was made due to the increasing cost of home maintenance and the sale of this business has great potential. This potential is due to the strategic location because currently the location is in the tourism area and religious centre in Kudus. This makes it easier for the production to be marketed to potential consumers. Figure 3 shows the house plan of Atmowidjojo’s.

![Figure 3. House plan owned by Atmowidjojo](image)
The system of form and style in the application of adaptive re-use, the building has not undergone many significant changes. This situation is in accordance with the meaning of adaptive reuse which does not require a lot of dismantling of buildings, but can increase economic value. Changes are needed to adapt activities to new spatial functions. In supporting the needs of textile business activities which consist of; (1) production activities; (2) storage of raw goods and finished goods; and (3) marketing activities, then more infill development is needed in the organization of space, while for the physical system only adjusting the space to accommodate marketing activities. Infill Development steps, namely; by building new buildings on former or abandoned land and old buildings for the purpose of meeting the needs of growing urban activities [16].

The spatial system of this house is in accordance with the spatial system of the sacred traditional house, namely; (1) The orientation of the building faces south; (2) The floor plan of the south end of the house is a service area, living room, bedroom, and to the west there is a family room and warehouse. It can be seen in Figure 3, which is a house plan before the adaptation to changes in activity in this house. After the adaptation of the function of the new space, there are changes. The changes are located in; (1) The foyer is used as a display room; (2) the bedroom is used as a production room; (3) Maid's room is used as a storage room for raw materials. Can be seen in Figure 4; namely a house plan that has undergone a change in the function of the room. The consideration of the display room is to replace the foyer because the area is close to the mosque, so that it is more visible to Muslims who want to do or after praying in the mosque. Consideration of the production and drop off space is placed to replace the sleeping room, because the area is close to the main road access, making it easier for goods dropoff activities. Considering the raw material warehouse is placed to replace the maid's room because the area is close to the production and drop off rooms. This house has a land area of 1100 m², while the building area of this house is 694 m². It can be seen in Figure 5, which is a picture of the situation of the textile business activities in this house. Considerations The raw material warehouse is placed to replace the maid's room because the area is close to the production and drop off rooms. This house has a land area of 1100 m², while the building area of this house is 694 m². It can be seen in Figure 5, which is a picture of the situation of the textile business activities in this house.

Figure 4. House plan owned by Atmowidjojo that has undergone a change in function
Figure 5. Adaptive Re-use Activities of The Textile Industry

4.3 Adaptive Re-use of Gunung Kelapa Cigarette Factory House. Case two (2) adaptive re-use of the Gunung Kelapa Cigarette Factory house by utilizing the mineral water distributor business in Kudus. This house belonged to Nadirun bin Atmowidjojo, who was later handed down to the youngest child, Titik bin Nadirun. The existence of this house was established before nadirun founded his business. Cigarette Factory Gunung Kelapa was founded in 1927, so it can be concluded that this house is more than 94 years old. The consideration for making this house a mineral water distributor business is because the income from this business has the potential to become a big business. This income will be used as an effort to maintain the building.

The location of this house has potential in terms of the mineral water sales business. The house is located on the side of the road in the Sunan Kudus mosque area, where the area is the center of religious activities in Kudus. This area has a high intensity of use of mineral water, because of the many religious activities that require mineral water as a dish. The agenda of religious activities in the area is held regularly every week and there are also activities that commemorate Islamic holidays.

Architecturally, this residence has the same uniqueness as the Cigarette Factory Gunung Kedu residence, having a joglo house and an indische house in one area. The difference from the Gunung Kedu house lies in the time the joglo house and the indische house were established at the same time. The next difference is the integrity of the house. The sacred traditional house of Gunung Kelapa has been demolished, the demolition was replaced with a house with a modern style. This change is due to the difficulty of maintenance and in terms of space it is not in accordance with the activities of its users. In Figure 6, the indisch house and the modern house of Cigarette Factory Gunung Kelapa are presented.

System form and overall style of the building in the application of adaptive re-use, this house has similarities with the house ownership of Gunung Kedu, not much has changed significantly. Physical changes can be seen in the interior of the marketing and administration rooms, due to the adaptation to the function of the new space. The ornamentation and material have not changed much. Significant changes due to the adaptation process tend to be more in the spatial system of this house.
Spatial system this house still follows the spatial layout of the sacred traditional house. One example is the orientation of the core building facing south. It can be seen in Figure 7, which is the plan of the Gunung Kelapa house before the adaptation to changes in activity at the house. To support the needs of mineral water distribution business activities which consist of; (1) distribution activities; (2) mineral water storage; and (3) marketing activities, it is necessary to adjust the layout of this house. The adjustment lies in; (1) the bedroom is used as a display room for marketing and administration; (2) the carport is used as a storage space. Can be seen in Figure 8; namely the plan of the Gunung Kelapa house which has undergone adaptation to the function of space. The consideration of the display space being to replace the foyer is because this area has closer access to the main road to the Sunan Kudus tower mosque, thus facilitating the buying and selling process. Considerations for storage space and drop offs are placed to replace the carport, because the area is close to the main road access and the area has a large open space, making it easier to manoeuvre the drop off process. This house has a land area of 2654 m², while the building area of this house is 913 m². It can be seen in Figure 9, which is a picture of the interior of the display room in this house. making it easier to manoeuvre the drop off process. This house has a land area of 2654 m², while the building area of this house is 913 m². It can be seen in Figure 9, which is a picture of the interior of the display room in this house. making it easier to manoeuvre the drop off process. This house has a land area of 2654 m², while the building area of this house is 913 m². It can be seen in Figure 9, which is a picture of the interior of the display room in this house.
Figure 9. Mineral Water Marketing Display Room

5. Conclusions
The results of the research on the two cases of adaptive re-use of houses owned by Cigarette Factory Gunung Kedu and Gunung Kelapa can be concluded as follows; (1) The physical system and style have no major changes that can damage the authenticity of the house. Minor changes are located in the interior of the building which is used as a display room, so that it can reduce business capital, but can provide financial income; (2) The use of spatial pattern infill development steps in new activity containers. In the case of the Gunung Kedu Cigarette Factory house, there was a change in the foyer, sleeping room, assistant room into a display room, production room, and storage room. In the case of the Gunung Kelapa house, the bedroom and carport were changed into display rooms, administration rooms, and storage rooms;

The application of the adaptive reuse concept to the object of this research case is one of the pilot steps for the sustainability of the preservation of traditional houses and indisch houses in Kudus Kulon. The diversity of types of adaptive reuse that exist in this pioneering industrial entrepreneur's residence provides an overview of the strategies that need to be carried out to re-use residences that have historical value. In these 2 research case studies, they were selected based on the case of reusing the kretek cigarette industry pioneers' housing. The first case is a residential case by adaptively re-using the textile industry business. The second case is a residential case by adaptively re-using the mineral water distributor business. The reason for the residence of this industrial pioneer entrepreneur was chosen because, The users of this residence have an important role in the history of economic progress and cultural change in the Kudus Kulon Region. This change ultimately provides a history of the impact of changes to the architecture in the area.

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