The Furniture Arrangement Study in Housing Type 21m2

by Dyan Agustin

Conference Paper

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Abstract

The construction of simple 21 m² houses was built by developers, especially in big cities. At 21 m² type houses there is very limited space. To arrange the space in it, especially arranging furniture is very difficult because of the limitations of space where residents must be able to use space optimally but still comfortable and can accommodate all the activities of its residents. This study aims to determine the arrangement of furniture in type 21 m² houses and the factors that influence them. The resulting output is expected to be able to provide recommendations on the arrangement of simple houses of type 21 m². This study uses a behavioral approach with quantitative non-parametric data collection which is then analyzed qualitatively. From the analysis it was found that most of the 21 m² occupants had made changes to space zoning accompanied by additional furniture. Type 21m² house is a residence that prioritizes space effectiveness and efficiency by integrating the results of the calculation of broad needs in each space by assuming various possible movements, structuring the right furniture that fits the zone and its needs. Comfort for occupants of type 21 m² houses can be achieved, among others, with enough space for activity, lighting and airing. Good lighting and ventilation can be adjusted to the size and function of space. Sufficient space for movement can be realized by arranging furniture and good circulation.

Keywords: arrangement, furniture, type 21m²

INTRODUCTION

The rapid increase in population in Surabaya has an effect on the increasing need for land for residential development. This has an impact on the number of housing developments in Surabaya. The housing built is available in various types and the smallest type provided by the developer is type 21 m2. Type 21 m2 is a house with an area of 21 square meters that has space facilities, namely 1 living room, 1 bedroom and 1 bathroom. Of these facilities, of course, type 21 homes do not meet the ideal house criteria because there are some activities that are not contained in spaces such as family rooms, dining rooms, kitchens, bedrooms that are only 1 and so on. In the interior arrangement of spaces in residential homes is very small, it was found that in a small type of house spaces from a functional aspect are smelters and in terms of volume of activity there is a summary of large type houses. Summarization of space occurs in the living room where a small type of living room also functions as a family room, dining room etc. So that in a small type of house, a living room that is a space that gets more attention with interior planning that really fits the needs of each occupant (Soekri S, 2001). With a residential

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area of 21m2, it certainly creates various problems, namely receiving guests, eating bed, bathing, etc., must be done in a limited space, as well as in terms of filling and structuring the furniture in it.

One of the 21 m2 type housing in Surabaya is housing Gunung Anyar Park. This housing is located in a strategic area in East Surabaya close to the east ring road and the Veterans National Development University of East Java. The main problem that arises in this housing is the limited space that has an impact on the lack of space facilities including the use of furniture that is not in accordance with the space, causing space to appear narrower, circulation in the room that is not smooth and the placement of zoning that is not in accordance with space placement. This condition causes residents to be uncomfortable in utilizing the available space. Therefore it is necessary to do research to find out how the arrangement of furniture in type 21m2 houses and the problems that arise due to structuring the furniture. By knowing the existing arrangements, a suitable furniture design solution can be produced to overcome these space problems and can provide comfort for residents of type 21m2 houses.

METHODS

This study uses a rationalistic approach with qualitative deductive research methods. Theory is applied to find problems in the field then make the framework of his research, process data and results qualitatively. Rationalistic approach is an approach that looks at the truth not only from empirical facts but also through the argumentation of a part of thinking construction (Muhadjir, 1996). The preliminary data is obtained from the survey and observation stages by looking at the physical condition of the arrangement of 21 m2 type of furniture, measuring the physical dimensions of the room and collecting data through literature studies as a comparison media for data processing. Then simulations are carried out by applying furniture to existing house plans. In collecting data, the following stages are carried out:

a. Interview

Data collection was carried out through interviews of each occupant of type 21 m2 house in Housing Gunung Anyar Park, Surabaya. The goal is to find out information about the arrangement of furniture that is now used by homeowners.

b. Observation

Data collection was carried out by observing the object of research in the form of furniture in the room space of type 21 m2, directly recording everything related to research and making measurements of the physical dimensions of the room and furniture and measuring how much space was left for human circulation.

c. Documentation

Documentation about research objects in the form of photos or images as a result of observation and interviews.

d. Study of literature

Literature studies are conducted by studying reference books, reports / journals, magazines and other media related to the object of research.

The study was conducted based on a comparative analysis of the arrangement of space furniture in residential areas contained in type 21m2. Research methods can be described as follows:

a. Determination of case studies is done purposively by criteria:

- Building type 21m2 houses that have not experienced development

- Type 21m2 buildings that have undergone development and have been occupied by at least two years.

b. Empirical data collection is carried out in a detailed analysis of furniture placement and the possible space for occupants. Recording is done by redrawing and analyzing.

c. Comparing the advantages and disadvantages of space in terms of furniture placement aspects to the space that is related to the comfort and safety of residents.

Research stages

Making Hydrolysis Media

Each natural material in the form of lamtoro, tolo beans, snails, and rice crabs was roughly crushed using mortar for crabs, tolo and lamtoro, while for snails cut using a knife. Natural ingredients that have been crushed plus pineapple or papaya juice with a ratio of 1: 3 and left overnight. Natural ingredients that have been hydrolyzed are taken as much as 1 liter then added 20g of sugar and 15 g of agar. Then put into erlenmeyer sterile and sterilized using autoclave for 20 minutes.

Making Media without Hydrolysis

Semi-natural media without the hydrolysis process is made by roughly destroying each natural material such as tolo, lamtoro, crabs and snails then boiling them using distilled water. The decoction of natural ingredients is taken as much as 1 liter then added 20 g of sugar and 15 g of agar. Then put into sterile erlenmeyer and sterilized using autoclave for 20 minutes.

Pf-122 Bacterial Propagation Test

Bacteria are grown in semi-natural media in solid form, using the pour plate method. Before it is grown on semi-natural media, a dilution series of bacterial suspensions is carried out. The dilution results poured into the petri dish are the results of a $10^{-3}, 10^{-4}, 10^{-5}$ and 10^{-6} dilutions of 0.5 ml using a micropipette, then pouring solid semi-natural media which has previously been liquefied by 10 ml.

Observation Parameters

1. The incubation period of Pf-122 bacteria in each medium is semi-natural.

2. The population of Pf-122 bacteria in each semi-natural medium, on day 1 to day 3

3. The amount of dissolved protein in each semi-natural medium.

RESULT AND DISCUSSION

Housing is one form of housing that has a very close relationship with the community. This means that housing in a location more or less reflects the characteristics of the people living in the housing, (Abrams, 1964). Housing can be interpreted as a reflection of the human person, both individually and in a unity and togetherness with the natural environment and can also reflect the standard of living, welfare, personality, and civilization of the inhabitants, the people or a nation. (Yudhohusodo, 1991).

Adaptation of space in buildings is an activity in space to accommodate the growing demands of activities so as to maximize the value of space (Schmidt, 2011). In a certain period of time, the building has decreased performance

in terms of functions and elements of its architecture. Building is not only a silent object but a dynamically moving object with shifts in the environment. There are six building adaptation strategies (Schmidt, 2010) including:

    a. adjustable (change of furniture or furniture)

    Adjustable is a change in equipment or furniture because it adjusts to the wishes of the user or owner.

    b. versatile (change in space order)

    versatile is a change in the physical order of space that is influenced by the presence of components and furniture.

    c. refitable (changes in component performance)

    Refitable is related to changes in components that affect the architectural elements of the building.

    d. convertible (change of function)

    A convertible is a change that is caused due to an additional function or expansion of space.

    e. scalable

    scalable is a building adaptation that is related to the construction of additional structures in meeting the needs of users or owners.

    f. movable (location change)

    Movable which is the location of buildings because the building can no longer meet the needs of residents and owners. While according to Suptandar (1999) zoning will affect the activities of residents and furniture in the zone. There are four zoning groups, namely private areas, semi-public areas, public areas and service areas.

The location of the strategic residential Gunung Anyar Park, which is close to the National Development University of Veteran, East Java, makes this area grow very rapidly. This causes physical changes in both space and furniture. Changes made include making repairs, extensions, additions, replacement of functions and changes in total. According to the results of the survey conducted, it was found that residents who made total changes had the highest percentage of 66% and the lowest percentage (13%) in minor changes. Residents who live in housing Gunung Anyar Park generally have families with family members of 3-4 people (33%). The efforts made by residents in fulfilling more space needs by developing (building a backyard or front yard) as much as 94%.

Some of the main furniture in the house, such as beds and wardrobe in each of the dwellings, are mostly taken from the original residence (old furniture) and then buy new furniture (40%). The reason they bring old furniture besides economic factors is also because they consider the furniture still suitable for use. Whereas in the process of increasing demand for housing, the residents bought some new furniture.

The motivation of residents to make changes in furniture arrangement is because the residents are getting older (84%). With the increasing age of some family members it affects the activities carried out in the house. So that there is a change in furniture arrangement that adjusts to the new activities of residents.

Questionnaire results related to activities

In tracing the type and time of carrying out activities within the house for 24 hours, a theory of network planning with guidelines was tried that family activities are sequences based on time, and placed on the parent line

for 24 hours, while activities that are individual are components of activities that starting according to the time of the appropriate family activity, so that the possibility of occurring simultaneously with the line of parallel activities and ending at the 24th deadline is the end point of activity in one day.

By applying the theory, the most activities that occur in spaces are obtained, so that the most dense types of space can be known and spaces that are rarely used. Whereas in type 21m2 occupancy in accordance with the housing technical requirements that consist of one bedroom, one common room, one terrace and one KM, then the assumption used in the type of room is 21 m2, one terrace, one bedroom, one living room and one km .

Table 1. Occupancy activities of 4 people (5,25 m2 / person)
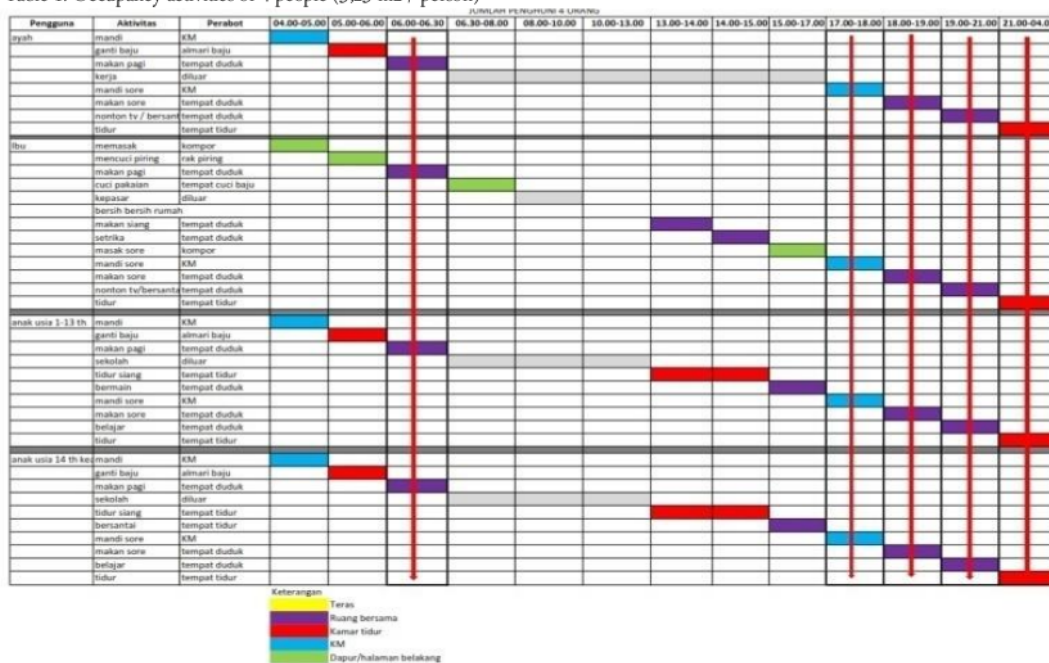
Results of Zoning Analysis

At the beginning of occupying existing zoning, it is already sufficient, only in the shared space there is a buildup of zoning, namely as a public and semi-public area, namely as a living room and as a family room, study room, ironing room, dining room. If it is occupied by 2-3 people as in the analysis of activities above the room can still be used quite comfortably. But if there are more than 4 people inhabited at the beginning of occupation, the comfort will be reduced.

Zoning changes

At the stage after inhabiting zoning type 21m2 houses experienced several changes. This is due to increasing some space on the backyard and front page to support the activities that occur. On the results of the analysis found several levels of zoning changes made by residents include:

a. mild change

Included in the category of light change zoning is the core area not experiencing changes in the nature of space (private, semi-private, public, servicing) only a few additions occur. In the analysis found additions occur in the backyard, namely the addition of private properties (bedrooms) and service (kitchen).
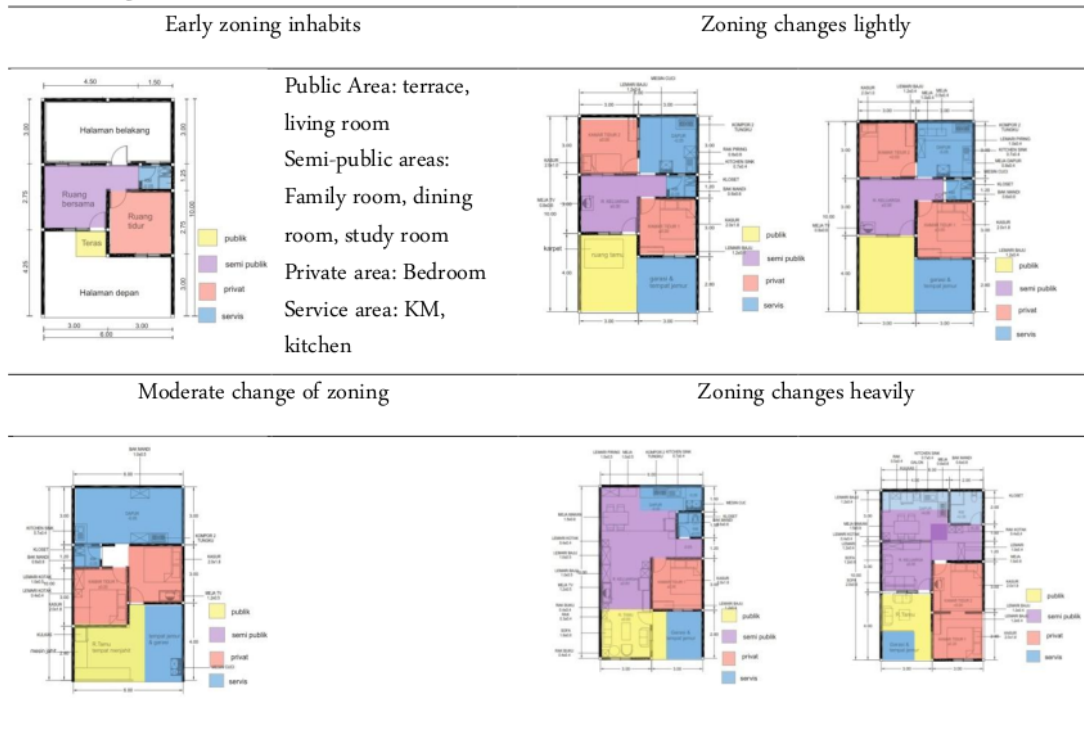
b. moderate change

Included in the category of moderate change zoning is that the core area undergoes several changes in the nature of the space as well as the addition of space properties. In the analysis found changes in the nature of space occur in the shared space area, which was originally semi-public turned into private because the shared space was changed to sleeping space, while the activity of receiving guests was carried out on the front page. While the addition of space function occurs in the front area, namely the existence of a drying chamber so that the added function becomes a service area.

c. severe changes

Included in the category of weight change zoning is that the core area undergoes many changes in the nature of the space as well as the addition of space properties. In the analysis found changes in the nature of space occur in the service area turned into semi-private (mushola). While the addition of space functions occur in the rear area, namely the existence of a kitchen and dining room , so that the function becomes a service area and semi-private.

Table 2. Zoning

Early zoning inhabits	Zoning changes lightly

Public Area: terrace, living room
Semi-public areas: Family room, dining room, study room
Private area: Bedroom
Service area: KM, kitchen

Moderate change of zoning	Zoning changes heavily

Results of Furniture Arrangement Analysis

Initial furniture arrangement

In the beginning there were many residents who brought furniture from the old residence. They utilize and use space in a multifunctional manner. The first addition was made to make a kitchen in the backyard. This is because the kitchen is not provided permanently by the developer, so residents make the kitchen in the backyard area. besides that the backyard area is also used as an area for sunbathing. In the type 1 furniture arrangement plan occupants choose to use furniture that can be assembled, especially in a shared space. They use carpets / mats as a place to sit. The function of this mat is also a place to sleep because at the beginning of the population there were a number of residents above 4 people. This results in the need for extra beds because the bedrooms provided in the 21m2 type only amount to 1 piece. Whereas type 2 occupants use furniture from their previous residence. For example, using sova in a shared space. The function of sova here arises only as a place to sit both to receive guests, watch TV, eat, or other activities, so that this type is widely applied by residents of 2-3 people. While the needs of other activities such as sleeping, bathing, cooking, drying have been fulfilled in the bedroom, kitchen, backyard.

Arrangement of furniture changes

The building cycle is influenced by a period of time because it can record building adaptations that occur. Old buildings can affect owners or users to maximize buildings with changes and adjustments in increasing capacity and needs. Buildings that experience adaptation are influenced by the existence of influencing factors such as the function of buildings that are not suitable, the quality of buildings decreasing due to age (obsolescence), the increase in the number of occupants and other factors including the desire of residents. Schmidt, et al. Stated that adaptation as a design characteristic is an embodiment of order, structure and service strategies that allow the level of physical objects to respond to changes in parameters over time. In a case study that took place in Taman Gunung Anyar Housing after the process of occupying an average of more than 10 years almost 90% of homeowners made changes to both changes in space layout and changes in furniture arrangement. The results of the findings reveal several levels of changes made by homeowners, including:

a. Mild change

In this light change, residents only make changes to furniture (adjustable). The changes in furniture (adjustable) proposed by Schmidt include furniture types, coordinate relations, modules, connection systems, installation elements, ease of storage, non fixed elements, easy interface. The old furniture is still used so that when buying new furniture the homeowner adjusts to the arrangement of the existing layout. While the purchase of furniture caused by replacement of damaged furniture does not change the overall layout. The results showed that mild changes were only about 10% of the 30 home samples studied. The period of changes in the space order and changes in space layout occur in the daily or monthly period. This is related to the factor of increasing the number / age of occupants, the increase in income and the damage factor of furniture.

b. Moderate changes

In this medium change, residents make changes to furniture (adjustable), changes in versatile and convertible space. The strategy of versatile change and convertible is a building strategy related to space. The order is influenced by the use of space that is used simultaneously. The characteristics of this strategy include portable, easy connections,
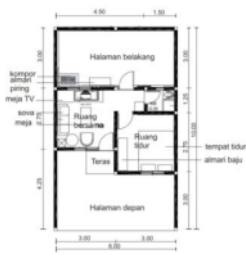
units that can be easily compiled and dismantled, and emphasize changes in space elements according to user needs. The results of the study indicate that changes in spatial layout arrangement due to addition, displacement and expansion of space occur a lot in the core building. In the survey results changes in spatial layout occur due to the addition of kitchens by utilizing the rear land. In addition, the addition of bedrooms by utilizing the backyard also made changes to the arrangement of space layouts. The rearrangement of space layouts also occurs in the terrace, living room and family room for activities of the social community and family. This is related to the findings of the form of furniture that is easily folded and moved. The results of the study indicate that changes are being made about 30% of the 30 samples of the house studied. The period of changes in the space order and changes in space layout occur in the daily or monthly period. This is related to the factor of increasing the number / age of occupants, the increase in income and the damage factor of furniture.

c. Severe change

In this change, residents make changes to furniture (adjustable), versatile changes, convertible, scalable and refitable changes. Scalable is a building adaptation that is related to the construction of additional structures in meeting the needs of users or owners. Refitable is related to changes in components that affect the architectural elements of the building. In conditions of severe changes, many residents make changes to the space structure, changes in the function of buildings to changes in the structure of buildings. The building which was originally only a place to live then increased its function with the function of trade and services by opening a grocery store. The addition of these functions takes advantage of the front yard area. The addition of rooms in the front yard changes the core structure of the initial house. Changes in room layout because the addition of new furniture is mostly done by homeowners because of the increase in family members. The results of the study indicate that changes are being made at most about 60% of the 30 samples of houses studied. The period of occurrence of changes in space arrangements and changes in building structure occurs in the annual period. This is related to the factor of increasing the number / age of occupants, the increase in income and the damage factor of furniture.

Table 3. Furniture arrangement

Initial furniture arrangement	Arrangement of furniture changes lightly

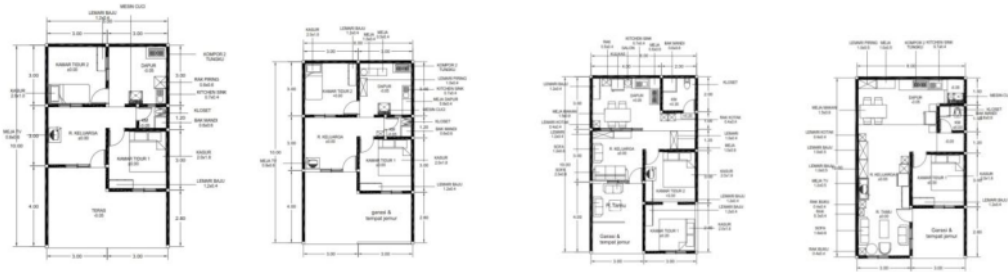| Medium change furniture arrangement	The arrangement of furniture changes heavily

Figure 1. Terrace photo which is used as a sunroom and garage

Figure 2. Backyard photo that is used for the kitchen

CONCLUSION

From the analysis of furniture arrangement related to activities, zoning, in a room it can be concluded that the arrangement of furniture for houses of type 21m2 is as follows:

1. A 21m2 occupancy should be occupied by 2-3 people (two adults and one small child aged 1-13th).

2. The available space is utilized very efficiently so that it can accommodate all occupants' activities and show the impression of spacious and spacious spaces

3. Completion of interior space by linking all elements of space on the basis of consideration of the function and composition of furniture according to the needs and conditions of space.

Type 21m2 house is a residence that prioritizes space effectiveness and efficiency by integrating the results of the calculation of broad needs in each space by assuming various possible movements, structuring the right furniture that fits the zone and its needs. The creation of spatial impressions is obtained horizontally and vertically with proportional dimensions in order to create physical and psychological comfort. General guidelines Healthy simple houses have arranged several provisions relating to the research that has been carried out, namely the per-person space requirements are calculated based on basic human activities in the house. The type of 21m2 housing conditions studied were in terms of the number of occupants, in some cases the number of occupants was too high and had to make renovations. Indicators of motion (arrangement of furniture and circulation) in this study can be declared successful because of the homes studied, there is sufficient and comfortable space for occupant activities.

ACKNOWLEDGMENT

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