

## THE EFFECT OF ROOM LAYOUT FUNCTIONALITY ON USER NEEDS IN LIMITED ROOM AREA

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### ABSTRACT

Law No. 5 of 1960 concerning the basic regulations of Agrarian Affairs is the applicable law in Indonesia relating to the ownership of land rights, which stipulates several types of land rights to utilize land according to the purpose of its designation. The bedroom can have many functions as a room, not only for sleeping but for getting ready, studying, and even doing other activities. So that these problems have an impact on designs that have a limited area, but become an obstacle to being able to take advantage of the existing space. The impact of limited room space includes: limited activities, needs, and affects user psychology, so this problem becomes the goal to overcome a room that has a narrow/limited layout. The purpose of designing a room layout for the needs of this user is to provide a design by relying on accessories, openings, storage that are multifunctional so that they can create a neat, clean, spacious room, as well as a comfortable layout circulation. with a design method that emphasizes the comfortable side, multifunction, clear circulation, and safety can overcome problems in designing the layout of a narrow space, especially rooms.

**Keywords:** Productivity, functionality, clear circulation, multifunction, layout

### 1. PREFACE

The more limited land makes it difficult for a residential building to get a comfortable and spacious circulation layout, whether it's a building site, apartment, or flat. with the limited land available in indonesia, interior designers are more receptive to the situation and at the same time provide a challenge for themselves to create a variety of multifunctional furniture. therefore, with limited land, especially in the jakarta area, with the results of the study, the population of dki jakarta in 2019 reached 11,063,324 people, plus foreigners (foreign citizens) 4,380 people. meanwhile, the area of dki jakarta is 662.33 km<sup>2</sup>. so, the population density of jakarta currently reaches 16,704 people/km<sup>2</sup> (department of population and civil registration, governor decree no. 171 of 2007, central statistics agency, friday 6/3/2020).

Strict layouts usually use furniture components with a system of modules or units that can be combined to produce a combined or multifunctional structure. in extreme conditions, strict layouts can be made an integral part of the spatial architecture (ching & binggeli, 2012). interior planning that utilizes a multifunctional system on a limited layout becomes an opportunity for designers to be able to create solutions in overcoming various issues related to narrow or limited layouts. where furniture or furniture also has a role to give the visual character of an interior arrangement. in addition, zoning or zoning is very important in designing a building that has a narrow or limited scope where the interior designer must refer to programs for certain uses that must be fulfilled and activities that must be accommodated (kilmer & kilmer, 2014). after getting the area of a room that has been divided according to need, it is important to think about comfortable circulation. the goods in a room require an

area of 30%-50% of the total floor area, while the remaining 50%-70% is used for circulation needs (panero & zelnik , 1979). furthermore, the layout of a piece of furniture or furniture is also considered where the layout of the furniture depends on the circulation, view, and density of space.

Indicators that affect users of a narrow or limited space are activities, needs, and affect user psychology. where the existence of these indicators makes room users feel uncomfortable with the layout, circulation, and furniture in the room so that users cannot make a room a place of privacy or otherwise. therefore, by creating a design that has a high value and other supporting functions, a design that is designed will provide more satisfaction to the users of the space with all the considerations that have been thought out by the designer, where with an adequate design it will give the impression of being comfortable., happy, relaxed, and calm that is felt directly by the user.

## 2. RESEARCH METHODS

### Case study

In this design, the researcher chose the topic of the influence of room layout functionality on user needs in a limited room area located in the magenta pantai indah kapuk 2 or pik2 cluster. Until now, interior development is still continuing and some design decisions are final so that there are still revisions by the interior. In addition, the magenta cluster location is one of the new locations in the jakarta area which is located at pantai indah kapuk, kamal muara, kec. Penjaringan, north jkt city, special capital region of jakarta. This location is one of the reclamation islands in jakarta. With an area of up to 1000 ha, consisting of an exclusive residential area, apartments, office buildings, commercial lots and the central business district (hereinafter referred to as cbd). The entire area is integrated with the green belt covering an area of 60 ha. Which is designed to synergize between urban forests and the lives of the modern urban people of metropolis, which is dubbed as the new jakarta city.

**Figure 1**

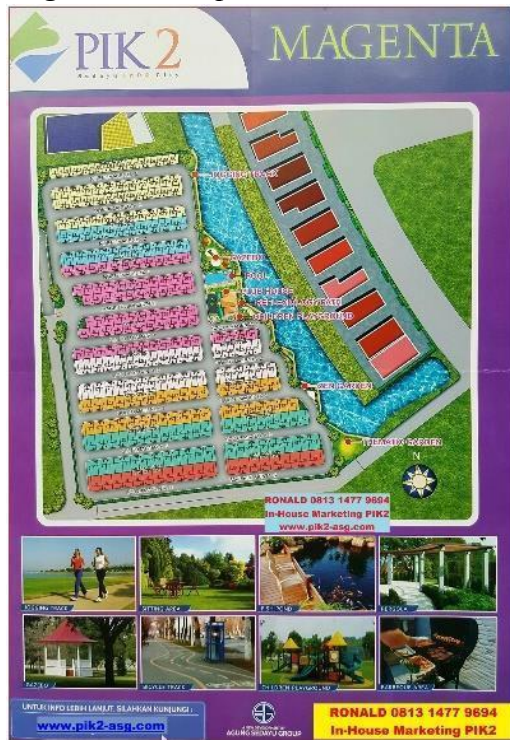
*Magenta cluster master plan*



*Source: PIK2 cluster magenta marketing website*

The following is the overall Master Plan for the PIK 2 area which is one of the titles of this design. The picture above shows the location of the reclamation island which will be an interior design project.

**Figure 2**  
*Magenta cluster plan*



**Source:** PIK2 Cluster Magenta Marketing Website

The following is a brochure description of the layout of the PIK 2 Cluster Magenta housing, so that it is clearly seen in detail the location of the cluster.

Pantai Indah Kapuk is a well-known elite independent area in Jakarta. In the first place is road access, because the location of this PIK looks like it is in the middle between West Jakarta and Tangerang. Agung Sedayu Group was established in 1971 as a shop building contractor in Jakarta. Over time, in 2004 the Agung Sedayu Group in collaboration with the Salim Group launched a mega project in a prestigious area in North Jakarta. This area is now known as Pantai Indah Kapuk. Pantai Indah Kapuk is an area developed by the Agung Sedayu Group to become an iconic area in North Jakarta.

PIK2 offers the Biggest New Town Development concept, also claims to offer millions of facilities by adopting a green concept. Agung Sedayu Group allocated a green area of 60 ha. Meanwhile, the Central Business District (CBD) covers an area of 100 ha, 4 km long white sand beach, a lotte world theme park covering an area of 50 ha, Mata Elang International stadium covering an area of 10 ha, and other facilities covering an area of 520 ha (PIK2 Office Website, Saturday, 3/2/2018)

**Figure 3**

*PIK 2 Real Site Project*



*Source: PIK2 Sedayu Indo City, 23/6/2019*

The following is a picture of the PIK 2 area which will be used as a residential area for the Magenta Cluster and also the beach.

**Figure 4**

*PIK 2 Real Site Project*



*Source: PIK2 Sedayu Indo City, 23/6/2019*

In the picture above is a bridge that connects Golf Island to PIK2.

**Figure 5**

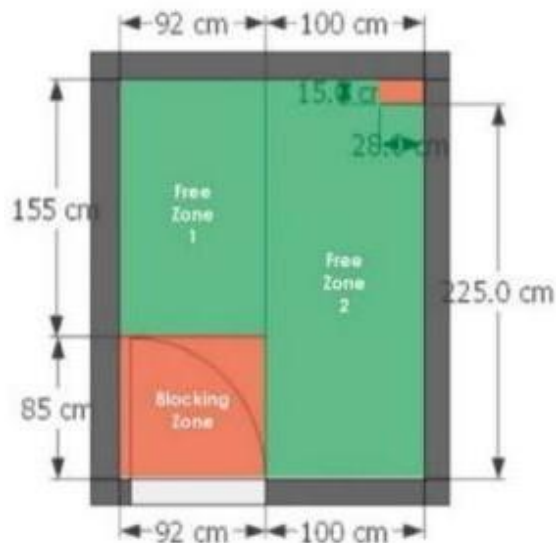
*Japanese moodboard in bedroom magenta*



*Source: Personal document*

In addition, the researcher determines a Moodboard before proceeding to the 3D stage which will be presented to the client to get a design decision. Researchers apply the Multifunctional system in narrow or limited rooms by making a stage with storage on the stage so that it can store client items. This design is supported by wood accents as a support for the Japanese concept and Special Paint on the walls as a support for the Scandinavian concept. In this design, there is not much playing with accents that are too overly in order to be able to make the atmosphere of the room natural and calm.

**Figure 6**  
*Room Zone Division*



**Source:** Pijar Sophan, 2021

The division of zones in a room is a way to be able to divide the area needed according to needs, the purpose of zoning is to get private, semi-private, and public areas.

**Table 1**  
*Standard Bed Size*

No.	Size Type	Standard Size
1.	Length	198 Cm
2.	Width	91 Cm

**Source:** *Human Dimension & Interior Space, 1979*

And for a standard work desk, the length of the desk is about 76.2 - 91.4 cm or a large table type with a length of about 152 - 183 cm, a width of 76.2 - 91.4 cm and a table height of

**Table 2**  
*Standard Size Table*

No.	Type Size	Standard Size
1.	Length	76,2 cm - 91,4 cm atau 152,4 cm – 182 cm
2.	Width	76,2 cm – 91,4 cm
3.	Height	73,7 cm – 76,2 cm

**Source:** *Human Dimension & Interior Space, 1979*

**Table 3**

*Parameters for reviewing productivity levels, comfortable, room layouts that have a limited area.*

No.	ASSESSMENT PARAMETER
1.	Utilization of storage or Storage in each stage area adds to the level of efficiency and multifunctionality of room users.
2.	The use of supporting accessories in all storage areas makes it easier for users to store goods.
3.	Working Desk sizes range from 120 cm long to 60 cm wide.
4.	Circulation between Wardrobe and bed ranges from 60 cm.

**Source:** *Human Dimension & Interior Space, 1979*

**Table 4**

*Material Parameters*

Material	Partickel Board	MDF	Plywood	Solid Wood
Endurance	√√	√	√√√	√√√ √
Strength	√√	√	√√√	√√√ √
Fiber quality	√√	√	√√√√	√√√ √√
Price	√√	√√√	√√	√
Total	8	6	12	14

**Source:** *Pijar Sophan, 2021*

Based on the material parameter table above, with the acquisition of the highest total value, namely Plywood and Solid Wood with an amount of 12 & 14, which will be used in the interior design of the room, which is located in the Magenta Cluster, has advantages over the 2 materials above.



**Table 5**

*Parameters of Feasibility Level of Multifunction Layout Implementation.*

No.	Parameter Value
1.	The function of the individual space is one of the important roles of the interior layout of the building which makes a functional relationship between the space and the user.
2.	Circulation in the layout design considers sufficient space for comfortable walking to all parts of the room and access to all furniture. Furniture layout design is considered in spatial planning, a sub-field of spatial resource allocation (Kilmer and Kilmer 1992; Kubba 2003; Pile 2007; Karlen, 2009).
3.	Cohen et al. (2001) identified 12 topics in the relationship between energy efficiency and users including; physical conditions of the environment (i.e. lighting, noise, air: movement, quality and temperature), personal control over physical conditions, management's response to complaints, overall health & comfort productivity, background and overall building quality.
4.	Evans et al. (1996) stated that interior design elements cause negative psychological effects on residents who live in crowded houses.

**Source:**

[https://www.academia.edu/7590559/INTERIOR\\_LAYOUT\\_DESIGN\\_PARAMETERS\\_AFFECTING\\_USER\\_COMFORT\\_IN\\_ENERGY\\_EFFICIENT\\_BUILDINGS](https://www.academia.edu/7590559/INTERIOR_LAYOUT_DESIGN_PARAMETERS_AFFECTING_USER_COMFORT_IN_ENERGY_EFFICIENT_BUILDINGS)

### 3. RESULT AND DISCUSSION

From the results of the discussion that has been Conclude through various studies, theories, and parameters regarding the design of the effect of room layout functionality on user needs. This designed room layout has a very functional layout and function where the division of zones has been considered with various supporting theories so that space users are more comfortable to occupy the space. However, with the various considerations that exist regarding the theory, parameters, and considerations that have been examined, there are several things that affect the design, therefore these still do not meet the existing parameters.

**Figure 7**

*Front View Bedroom Interior design effect of room layout functionality on user needs*



**Source:** Personal Document, 2022

The interior of this room does not display too many ornaments because it strengthens the Scandinavian style in the interior, and there is a lot of storage for storing equipment from room users so that they can be free in the room.

**Figure 8**

*Perspective View Bedroom Interior design effect of room layout functionality on user needs*



**Source:** *Personal Document, 2022*

The following is a 3D rendering of a room designed with the Japanese concept in mind.

**Figure 9**

*Right View Bedroom Interior design effect of room layout functionality on user needs*



**Source:** *Personal Document, 2022*

The following is a right view of the Wardrobe which is designed to blend with the sleeping area, so that the Wardrobe layout in that area creates a lot of area for circulation.



**Figure 10**

*Perspective Bedroom Interior design, the effect of room layout functionality on user needs*

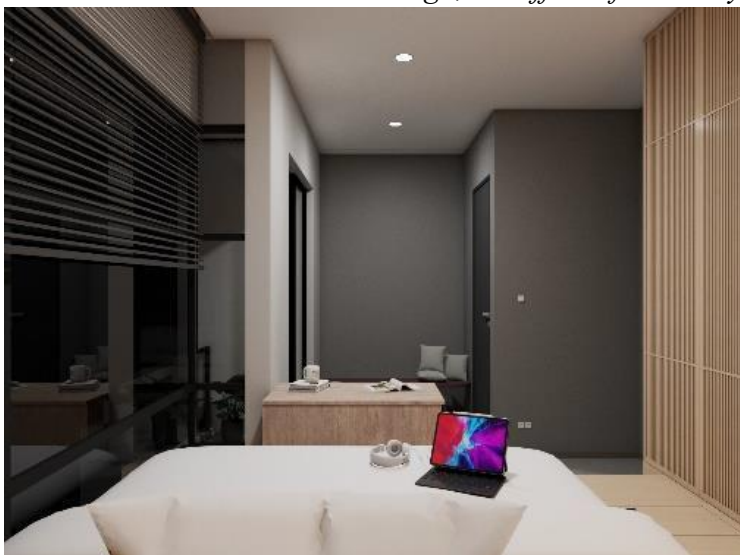


**Source:** *Personal Document, 2022*

It can be seen from the results of the interior that has been designed that there is storage in the circulation area which is made of 80cm so that the area is used as a storage area. Therefore, this wardrobe designed also has a similar color tone and material so that it can strengthen the concept of Japanese style.

**Figure 11**

*Back View Bedroom Interior design, the effect of room layout functionality on user needs*



**Source:** *Personal Document, 2022*

Here's a back view in a simple design to get a Scandinavian impression.

**Figure 12**

*Perspective View Bedroom Interior design effect of room layout functionality on user needs*



**Source:** *Personal Document, 2022*

In the rear view that is designed, there is not much storage made where the rear view is designed to be simpler and more empty so that circulation can be more comfortable and can also make the area a relaxing area and other activities as well as the selection of color tones and colors neutral so as not to make the interior atmosphere more playful.

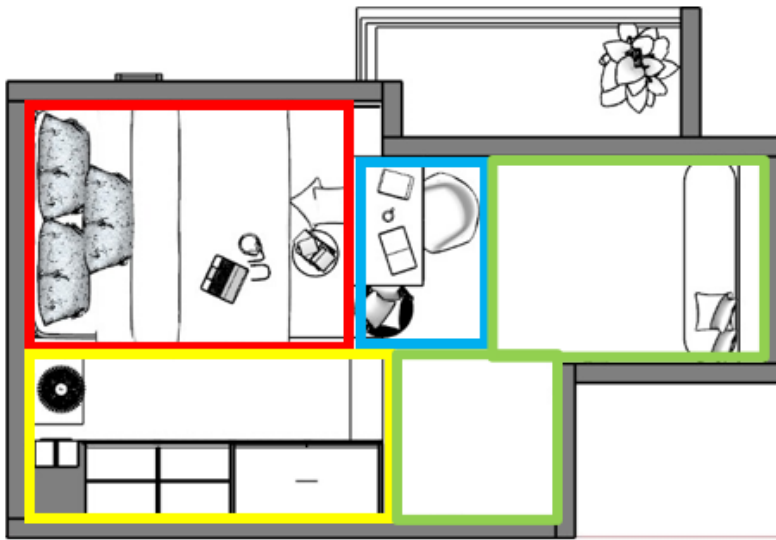
The following is a layout that has been designed and has been zoned into the division of areas in order to create various circulations that are more spacious. In addition, the placement of furniture and sizes also meet the Human Dimension standards.

In the rear view that is designed, there is not much storage made where the rear view is designed to be simpler and more empty so that circulation can be more comfortable and can also make the area a relaxing area and other activities as well as the selection of color tones and colors neutral so as not to make the interior atmosphere more playful.

The following is a layout that has been designed and has been zoned into the division of areas in order to create various circulations that are more spacious. In addition, the placement of furniture and sizes also meet the Human Dimension standards.

**Figure 13**

*Layout design effect of room layout functionality on user needs*



**Source:** *Personal Document, 2022*

The division of space zoning is marked by colors where there are areas in red, namely areas that have private and sensitive zones where the red area is a sleeping area which will be an area that not everyone can be in that area. Furthermore, the area with the yellow color, the area is an area where there are various storage areas to store user needs and at the same time become a dressing/wardrobe area, this area has a semi-private zone. Furthermore, the area marked in blue becomes a study area whose position is in front of the mattress, thereby reducing the available space to be used as a circulation area, the zone is marked as a semi-private area as well, and the rest marked in green are public areas which become circulation areas. to play.

**Figure 14**

*Section 1 room layout*



**Source:** *Personal Document, 2022*

The following is a snippet of the front view of a room interior design.

**Figure 15**

*Section 2 room layout*



*Source: Personal Document, 2022*

The following section looks right from a room interior design that illustrates a Wardrobe.

**Figure 16**

*Section 3 room layout*



*Source: Personal Document, 2022*

The left view of a room interior design for the study area.

**Figure 17**

*Section 4 room layout*



**Source:** *Personal Document, 2022*

Based on research on the existing parameters, some of the parameters that have been examined have met the standardization of a multifunctional layout, but with the design of the layout with the parameters of a multifunctional bedroom, it provides an opening and sufficient area to be applied to rooms with a limited area.

Therefore, with this designed layout, the determination of the area of the room combined with multifunctional storage to match so that the circulation of the limited rooms can be applied.

**Table 6**

*Comparison of data analysis with parameters to review the effective level of efficiency, and productivity*

Parameter assessment by study	Room layout according to multifunction standards	Compatibility with parameters
The application of this multifunctional layout increases the level of productivity, functional, comfortable rooms so that the comfort is even more felt.	Application of storage to minimize the use of areas that interfere with room circulation	Appropriate fit
The height of the supporting furniture for a limited layout such as a stage, ranges from 40- 60cm	The stage made in this room ranges from 40-50 Cm	Appropriate fit
Circulation in the room area $\pm$ 100-200 cm	Circulation in the room area has an area of 200 x 200 cm	Appropriate fit



The size of the working desk in the room area, which is designed by considering the limited area, ranges from 80cm-100cm in length and 50/60 cm in width.	The total working desk designed in the room is 80 cm long and 60 cm wide	Appropriate fit
Open space Circulation minimum area of 100-150m <sup>2</sup>	The design of the furniture, stage, and working desk that is designed is unified.	Not suitable / not suitable

#### 4. CONCLUSION AND RECOMMENDATION

Based on the results of the above analysis related to the design of the effect of room layout functionality on user needs in a limited room area, in accordance with the parameters that have been analyzed, the research above. Where a layout with a limited area makes a residential unit more limited, less comfortable in moving, thus affecting the psychology of the users of the space. With the guidance from the parameters, the designer finds steps in ensuring a residential room can decide on a design result with various openings and multifunctional storage so that clients can store things better. Therefore, the advantages that can be taken from the results of research on the design of this bedroom are that it can provide more standard circulation, more space users can take advantage of various storages that have been made directly or together with the bed area, users feel comfortable with the design that has been made. Thus affecting the psychology of the user. Besides that, the drawback is that space users find it more complicated to open storage when they want to store things, the atmosphere of the room becomes different so that a lot of furniture is compact, has a mediocre area. Therefore, suggestions from researchers to be able to provide a decision or design results in the future with the same case, then use a lot of supporting accessories available in various interior needs where by using accessories supporting an interior it will provide a solution in solving a problem in design.

#### Acknowledgement

This acknowledgment goes to the experts who have produced the parameters, as well as the journals available in this study as a supporting theory for the research, which is related to the topic of research on Functionality in a design, the effect of room layout functionality on user needs in this limited room area is endless. discussed thoroughly, because it is related to productivity, psychology, comfort, security, functionality, many things can affect it.

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