

# Functional and Aesthetic Considerations in Designing Compact Space as a Mixed Zone

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## ABSTRACT

The design of compact residential space plays significant role in today's society and design field. This category of design is served not only for human being as it's user but also for pets. The different categories of life become one of the segments that make a design more complex, unique, and interesting. This research and design project aims to find out more deeply whether the residential space for the mixed zone must be designed properly so as to provide comfort for both physical and psychological aspect. There are several physical comfort factors that should be considered in design such as visual, audio, thermal, olfactory, and ergonomical comfort. The method that is used in this research is divided into two stages, analysis and synthesis. In the design process, the author uses direct interviews with residential owners and users, collecting data from many references, and submitting digital designs. After the design process has been done, the room was divided to four parts. The difference in the use of ceiling materials, the size of each room, the distance of human circulation, and the selection of the right material are the main considerations in this design project. The selection of these elements cannot be separated from the design style that has been determined from the start, namely Contemporary Modern. Based on this research, it can be concluded that the mixed zone inhabitation should be well designed with optimal functional and aesthetic considerations to fulfill user's needs.

**Keywords:** Design, Mixed Zone, Functional and Aesthetic Consideration

## 1. INTRODUCTION

At this time, there are many interior spaces are designed very well by interior designers. Nice to look at and not boring is one of the most important things that every user wants. A well-designed room can make people in it feel comfortable. In addition to feeling comfortable in terms of inner, they also want to have a space that can meet their daily needs, both in terms of facilities and maintenance costs.

As time goes on, more and more people think that the comfort level of the space they occupy is the main thing to support their lives. Unlike the case in the past, which did not attach importance to the aesthetics of a space, the most important thing was not to be exposed to rain and heat directly. A consideration that is very important in designing a residential space is function. The aspect of function is also important which must not be forgotten by all designers. Changes in interior users at this time also make interior designers have to be more careful, because at this moment interior users are not only humans, but also animals.

In addition to function, the consideration that is no less important is style. According to Rosemary Kilmer and W. Otie Kilmer (2014, p. 53), it is difficult to talk about interior design or architecture without addressing the concept we often term "style". Style can be defined as a specific or characteristic manner of expression, execution, construction, or design, in any art, period, work, or employment, such as the Byzantine style or Modern style. Style is associated with various social graces, literary productions, personal expressions, and mannerisms. It can also mean "lifestyles," which reflect a complex relationship of trends and their influences on the way an individual or group lives. It is also commonly referred to an aesthetic considerations.

Based on that statement, we know that functional and aesthetic considerations are the most important thing of design. People are increasingly competing to create a comfortable and functional space with all its aesthetic considerations, both for humans and animals. Along with the high level of demand for space design, there are also more and more people who work specifically as interior designers.

Consideration of the design of a space must be concerned with the aspects of its inhabitants, named living things,

both humans and animals. In the beginning, humans did live individually. But as time goes by, more and more people want to live together with pets. For humans who do not have desire to raise animals, probably will not think about these considerations. However, for pet lovers, it is important to balance the design of spaces for people and animals.

Facilities that used by humans and animals have many differences, such as in terms of height, width, depth, and material strength. In addition to aspects that can be seen with the eye, it is also necessary to consider the olfactory aspect, named the smell of the air in the room. No matter how beautiful the room is, it will still feel uncomfortable if it has bad smell.

This paper aims to explore the functional and aesthetic aspects of this research and design project. The importance of these two aspects must be known by all interior designers, in addition to being a design references, it can also help the design results to be more focused and fulfill the other important continuity aspects.

**1.1. Related Work**

According to the explanation that has been described above, there are several articles that can be used as references in this design. We divided the existed work into 2 categories.

**1.1.1. Multifunctional Furniture Design**

Julian Veronika[1] explained in her paper entitled “Perancangan Furniture Multifungsi untuk Kamar Tidur 1 di Perumahan Grand Duta City, Bekasi Tipe 2 Lantai” that the use of space for furniture placement and circulation of space users can be designed efficiently. However, the design of this multifunctional furniture must pay attention to the size of human anthropometry and the furniture itself so that activities in the room are not hampered and the room still looks spacious. As cited by Veronika in her paper (2021), Samuel[2] says that to minimize the furniture in the room, multifunctional furniture was designed. Anthropometric data is used for various purposes, such as the design of work stations, work facilities, and product design in order to obtain and appropriate sizes with the dimensions of the human body members who will use them.

Body Dimension	MEN				WOMEN			
	5%	X	95%	S.D	5%	X	95%	S.D
1. Body Height Standing Position	1.532	1.632	1.732	61	1.464	1.563	1.662	60
2. Eye Height	1.425	1.520	1.615	58	1.350	1.446	1.542	58
3. Shoulder Height	1.247	1.338	1.429	55	1.184	1.272	1.361	54
4. Elbow Height	932	1.003	1.074	43	886	957	1.028	43
5. Knuckle Height in Relaxed Down Position	655	718	782	39	646	708	771	38
6. Body Height Sitting Position	809	864	919	33	775	834	893	36
7. Eye Height Sitting Position	694	749	804	33	666	721	776	33
8. Shoulder Height Sitting Position	523	572	621	30	301	550	599	30
9. Elbow Height Sitting Position	181	231	282	31	175	229	283	33
10. Thigh Thickness	117	140	163	14	115	140	165	15
11. Distance from Butt to Knee	500	545	590	27	488	537	586	30
12. Distance from Popliteal to Butt	405	450	495	27	488	537	586	30
13. Knee Height	448	496	544	29	428	472	516	27
14. Popliteal Height	361	403	445	26	337	382	428	28
15. Shoulder Width	382	424	466	26	342	385	428	26
16. Hip Width	291	330	371	24	298	345	392	29
17. Chest Thickness	174	212	250	23	178	228	278	30
18. Abdominal Thickness	174	228	282	33	175	231	287	34
19. Distance from Elbow to Fingertip	405	439	473	21	374	409	287	34
20. Head Width	140	150	160	6	135	146	157	7
21. Hand Length	161	176	191	9	153	168	183	9
22. Hand Width	71	79	87	5	64	71	78	4
23. Distance from right to Left Fingertip	1.520	1.663	1.806	87	1.400	1.523	1.646	75
24. Handgrip Height in The Position of The Hands Vertically and Standing Up	1.795	1.923	2.051	78	1.713	1.841	1.969	79
25. Handgrip Height in The Position of The Hands Vertically and Sitting Down	1.065	1.169	1.273	63	945	1.030	1.115	52
26. Distance from handgrip to back in The Position of The Hands Horizontally	649	708	767	37	610	661	712	31

Picture 1: Body Dimension  
(Source: Samuel, 2017)

By considering the reference table, multifunctional furniture will be easier to design. The size of the human body does vary, but usually the commonly used size will be taken as shown in the table above.

In addition to the paper created by Julian, there is also an article from journal that discusses the design of multifunctional furniture written by Burhan Leonardi Poetra[3]. In his journal entitled "Perancangan Perabot Multifungsi untuk Ruang Huni Terbatas", Burhan said that the concept applied to the design of multifunctional furniture units to achieve the above objectives was the practical packaging of minimalist tools, which refers to the practicality, convenience, and compact nature of the furniture system offered. Practical understanding according to the Big Indonesian Dictionary (KBBI) means easy and easy to use (run and so on). The meaning of the word utensil according to the Big Indonesian Dictionary (KBBI) in the word - household is the utensils used by households (tables, chairs, cabinets, and so on). The word

minimalism in the Big Indonesian Dictionary (KBBI) which has the basic word "minimal" means at least; at least. So in conclusion, the practical packaging of minimalist tools is a concept of the function of furniture that accommodates the primary activities of the occupants which are packaged in a solid and practical form.

Based on the chosen background and concept, its application into the design of the multifunctional furniture unit is as follows:

a. Form

The form that will be applied to each alternative adjusts the function that will be accommodated by the multifunctional furniture unit, but in general it will resemble around a cube, beam, as well as boards. This is intended so that the storage of furniture can adjust to the conditions of the existing space in general.

b. Material

Material selection refers to two options: Wood and Metal, which were later re-specified as: Multiplex, Solid Wood, and Iron/Stainless.

c. Hardware

Some construction systems use the types of hardware that are already available, such as piano hinges, butterfly hinges, harmonica hinges, magnetic hooks, slides, and others. However, to adjust the shape of the mechanism to be designed, it will require some additional construction systems.

d. System

In designing a multifunctional furniture unit, several alternative multifunctional systems will be applied to compare their advantages in terms of efficiency, effectiveness, production costs, and visual form.

e. Color

Regarding the visual aspect, the color that will be applied to this multifunctional unit of furniture is intended to be accepted by the target user that has been set.

### *1.1.2. Usage of Sharing Space for Mixed Zone*

Based on the paper entitled "Ruang Berbagi Antara Hewan Peliharaan dan Manusia di Rumah Tinggal" by Erina Asyera and Paramita Atmodiwirjo[4], they explained that there are various statement according to sharing spaces for mixed zone.

#### 1.1.2.1. Actors

Actors are people who play and act in a space. The activities of actors can define the place around them. Therefore, understanding the activities carried out by actors is important so that we know why a space is formed. According to Heimsath (1977) each person has a different role and does something according to the role that is intended for him. The role will affect the activities of the

actor. Lawson (2001) sees that basically there are dominant and submissive roles in everyday life. The dominant role always determines the applicable regulations. The submissive role must comply with the rules that have been determined by the dominant role. If there is no submissive role, conflicts can occur between these dominant roles. Heimsath (1977) further divides the roles into two, namely service and served roles. The service role is in charge of serving the served role in sharing things. Anything that must be done by the service role and the served role is regulated in the applicable house rules. As discussed earlier, activities create space. Therefore, in spatial planning we must pay attention to the activities that will take place in the space. Comfort according to Rybczynski (1987) is closely related to human qualities and how one achieves them. Everyone has their own way of arranging furniture in order to achieve comfort. The actor who is responsible for regulating the domesticity system is usually the person who plays the primary role in arranging the furniture in the house.

#### 1.1.2.2. Sharing Spaces Mechanism

Sharing space is an activity that is impossible to avoid when we live with family in the house. There are several things that affect the formation of this sharing space. Things that affect space sharing, such as zoning, interactions between actors, boundaries, distances, and territories also affect the formation of sharing spaces. Next, this will be discussed in more detail. Zoning is an instrument that is often used in architecture to achieve an ideal condition. According to Lofland (1973) zoning is an interesting separation instrument. Each room in the residence must be separated so that there are no conflicting activities as discussed in the previous discussion. Lawson (2001) divides space into two, namely the front of the house and the back of the house. The front of the house, or the front of the house, is the part of the house where we receive guests. In this section we tolerate the arrival of guests, whether they are complete strangers, remotely known strangers, or frequent visitors. Back of the house, or the back of the house, is the part that guests are not allowed to enter. Lawson (2001) divides the relationship between actors into reciprocal and non-reciprocal.

In reciprocal relationships there is social interaction, while in non-reciprocal relationships there is no social interaction at all because the actors do not have the same point of view. Lawson further divides reciprocal relationships into three, namely: a. Reciprocal confrontation: occurs when two or more actors are involved in negotiations or matches. b. Reciprocal consorting: occurs when two or more actors have the same point of view and interact intensely. c. Reciprocal co-existing: it is common for strangers to share space and have the same point of view. Basically, living things are divided into 2 different groups, namely contact species and non-contact species (Hediger in Lawson, 2001). Contact

species are living things that allow other animals of the same species to be very close to themselves. Non-contact species are animal species that do not allow too close contact between stars of the same species.

Humans belong to the category of non-contact species and are more prone to crowding problems than contact species. Therefore, humans tend to distance themselves to maintain their space from other people. Distance in animals is divided into two, namely flight distance and critical distance. (Hediger in Hall, 1966). Flight distance is the minimum distance a human or other animal can approach an animal before it escapes. Critical distance is the minimum distance at which if another animal enters this distance, the animal will attack the animal that violates this distance. The bigger the animal's body, the greater the flight distance it has. Looking at the discussion above, it can be seen that zoning, interactions between actors, distance, boundaries, and territories are important in discussing space sharing. Zoning is needed to determine which spaces are allowed to share space. Interaction between actors determines how close the distance between actors in sharing space.

### 1.1.2.3. House as a Place to Live for Humans and Pets

Domestic life will change when there are animals in it. These changes occur because of the daily life of pets and the daily lives of humans who live together. Daily activities that are repetitive and open to change (Till, 2009) support (un)doing and (over)doing. This (un)doing and (over)doing process will cause the existing regulations to change. This is not a bad thing because the existing definite rules will always be challenged by the changes that occur in life (Rende, 1998). The new regulations can change the old regulations or complement the old regulations.

Based on the related work that have been explained above, we know that to get a good small space, it is necessary to balance aesthetic and functional considerations in terms of visual, audio, thermal, olfactory, and ergonomic comfort.

## **1.2. Our Contribution**

This paper contains the results of interior space design inhabited by two categories of living things, humans and pets. In the design of this mixed zone, many factors that influence the design of the mixed zone have been explained. Starting from ergonomics and anthropometry, the furniture used by humans and pets to support their lives, to the application of aesthetics and functionality in design. After reading this paper, the author hopes that the reader can understand how to design a mixed zone

residential space with the existing considerations. Readers can also understand how to properly design a mixed zone residential space, both in terms of visual, audio, thermal, olfactory, and comfort. The purpose of this paper is to be useful for readers, both interior designers and users of space in need, as well as for the author.

## **1.3. Paper Structure**

The rest of the paper is organized as follows. Section 2 introduces the preliminaries used in this paper, which include basic theories regarding the design steps, the design style used, the factors that must be considered in designing the mixed zone space. Section 3 explains how the method used in writing this paper can be arranged properly. The results and discussion of the overall design results, how functional and aesthetic considerations are optimally applied, and other factors that affect the design results are described in Section 4. Finally, Section 5 concludes the paper and presents direction for future research.

## **2. BACKGROUND**

### **2.1. Preliminary and Basic Design Overview**

The residential space discussed this time is a small dwelling. There are bedroom, bathroom, cat litter cabinet, and storage area. In this space, there are 2 categories of living things that will often be active in it, named humans (office staff) and pets that have been cared for a long time (cats). The total area of the room is only 21,5m<sup>2</sup> so it is very important to arrange the furniture properly so it does not seem cramped and stuffy.

The interior space that designed by the author is located in a shophouse in West Jakarta, precisely on Jalan Mandala Utara, Tomang. The location of this building is very strategic because it is located opposite the school, close to the busway stop and the train station. This shophouse building consists of 3 floors whose main function is as an interior design consulting office. The first floor is used for meeting rooms, receptionists, admins, and library materials, while the second floor is used for workspaces, pantry, and warehouses. The area designed by the author is the third floor, which functions as a dorm for one office staff who lives there. Other than that, that area is also used by domestic animal, cats.

## **2.2. Design Methods**

The process of designing this space uses a 2-stage design according to William M. Pena, named programming (analysis) and schematic design (synthesis). According to William M. Pena and Steven A. Parshall (2001, p. 18) the overall design includes 2 stages, named analysis and synthesis. In the analysis, the problems in the design will be divided and identified. In the synthesis, these problems will be put together and a solution is sought. The difference between programming and design is the difference between analysis and synthesis. At the programming stage, the author analyzes what problems exist and need to be considered in the design process. After finding these problems, the step will continue with the schematic design stage, which is the search for solutions to the problems that arise. Without going through these 2 stages, the design process will not run smoothly because problems will be found in the middle of the design process and result in changes to the designs that have been prepared. The program preparation stage that has been carried out proves that there are several problems to be considered in the design which is commonly referred to problem simulation.

Collecting data to obtain the formulation of the problem is done by means of interviews with owners and users, field observations, and literature studies. Interviews with owners and users were carried out verbally by asking what space they wanted to build, what needs were needed, and what the cost benchmark would be. Field observations were carried out directly by the author by measuring the existing space, and finding out which parts could be maintained or not. The literature study conducted by the author aims to find out all information related to these pets while still considering human comfort. After the data collection process is complete, start moving to the next phase, named the design phase with the output in the form of the design results which will be discussed in Section 4.

## **2.3. Functional and Aesthetic Design Discussion**

The division of space and the selection of the right furniture will make the dwelling not feel small. According to Teguh Prihanto (2011, p. 9-10) if you want to develop your house vertically (upward), pay attention to various aspects as follows. Plan the layout of the space by making a list of space requirements, ensure the existing construction, pay attention to the aesthetic value of the harmony and balance of the view, lighting, access to enter, and maximize the potential of the existing view. Based on these things, it can be explained that the stages of the author in designing this residential space are taking measurements of the existing space, interviews with owners and users, making and submitting designs,

selecting materials, finishing, and loose furniture, and making working drawings.

According to Julius Panero and Martin Zelnik (2003, p.132) there are various kinds of human activities carried out in various residential spaces such as sleeping, eating, relaxing, meditation, having fun, making love, doing homework, cooking, bathing, and others. So it is important to take advantage of the use of the upper space, use one part of the space for several functions, or recycle the space creatively, especially used for different purposes, to accommodate the functions of a residence.



Picture 2: Interior Existing in front of Bathroom Area (Source: Domisilium Studio Archives)



Picture 3: Interior Existing in The Main Entrance  
(Source: Domisilium Studio Archives)

Aesthetic and Function are the main considerations in design this area. According to Yunida Sofiana (2015, p. 342) Aesthetics as one of the supporting elements what is important in a design has criteria and understanding of the things that become the basis for assessing the beauty of a design. Those criteria which known as elements of design and principles of design. These two criterias are rules an used in processed the creation of beauty in design, so that the resulting design can provide experience of beauty to those who see and use it. The design elements used in the design are point, line, plane, space, color, and texture. While, the principles of design that used are harmony, balance, contrast, proportion, emphasis, and rhythm.

The design process resulted in the division of space into 4 parts, named the entrance corridor where there is a cat litter cabinet, bedroom, bathroom, and storage room. This residential space is designed in a contemporary modern style. To provide good air circulation, this residence is designed with a gypsum board and polycarbonate ceiling. In the bedroom and half of the bathroom, the ceiling is covered with gypsum board and provided with downlights embedded in the ceiling, but for the corridor area and storage area using a polycarbonate ceiling with a height of about 385cm and for the lighting using a wall lamp.



Picture 4: Approved Floor Plan (Source: Domisilium Studio Archives)

After entering the main entrance, there is an “L” shaped corridor with a cat litter cabinet at the end. There is a cat cage located in front of the main entrance. Although it looks close to the main entrance and storage door, this cat cage will not interfere the circulation of space users. The direction of the main entrance opening is outward and the direction of the storage door opening is into the storage. Therefore, the door will not collide with the cat cage. At the end of the corridor, the cat litter cabinet is a built in cabinet that has a concept like a pantry with a width of 100cm according to the width of the corridor, which there is a place for cats under the cabinet. This cat litter cabinet is made from plywood and glued together with special glue. According to Sam Kubba (2003, p. 8) Wood was the primary material used in furniture production, although ivory was used occasionally. Ancient Egyptian and Mesopotamian craftsmen had a wide variety of joint techniques at their disposal. Indeed, most of the woodworking techniques known to modern cabinetmakers were in use by the ancient woodworker. Complex metal hinges and locking mechanisms that were initially utilized by the military also gained great popularity. Paint was also used for decorative effect by first covering the area with gesso. In many parts of the ancient world, including Egypt, Assyria, Babylonia, and the Levant, decorative textiles, pads, and cushions were also used for both seating and bedding.

The design applied to this cabinet is a contemporary modern style in accordance with other room design styles, using monochrome colors, and a simple design. As we know, there are several characteristics of contemporary modern design that are a reference and can be seen clearly

in interior space. The use of small and decorative windows has generally been abandoned in this style. Large window and openings are the right choice. In this style, the selection of colors and materials used tends to be more neutral, such as white, black, and grayscale. In addition, the use of large furniture has also begun to be abandoned, replaced by minimalist furniture with a light design.



Picture 5: Design Result of Cat Litter Cabinet which is located in front of the bathroom door, at the end of the corridor  
(Source: Domisilium Studio Archives)

Turning to the bedroom, the user only lives alone in this residence so they only need a single bed, wardrobe, and side table as the main furniture. The supporting furniture provided is a wall mirror, air conditioner, as well as switches and sockets. The style applied to the bedroom is also inseparable from the overall style, named modern contemporary with light gray wall colors, white ceilings and furnitures, and wood vinyl floors to add a warm impression.

Next to the bedroom, there is a bathroom that has the same wall depth as the bedroom so that it gives a neat impression. The bathroom is divided into two parts, namely wet and dry. There is a semi-closed shower box, a sink, and a closet with a towel hanger, ledge, and tissue holder to support activities in the bathroom. The entire bathroom wall is covered with subway tiles as high as 100cm and the top is painted black to give the space an elegant impression.

There is a uniqueness in the design of this bathroom. The ceiling is only used for half of the bathroom, half of which is left open as high as 350cm and given polycarbonate so that sunlight can directly enter the bathroom. The bathroom is designed like this because users usually dry their clothes in the bathroom so they need strong sunlight so the clothes can dry quickly. Other than that, the advantage of using a half ceiling also minimize the use of artificial light which automatically saves electricity usage. The use of natural light from the sun is also better for body and health. The last element is the floor. The use of floor material is adjusted to the floor in front of this area, wood

vinyl. This type of floor material is applied to dry areas such as corridors, bedrooms, and storage. In the bathroom and under the cat litter cabinet using gray granite tiles. The use of this material is also adapted to the interior style used, Modern Contemporary.



Picture 6: Section of Bedroom and Bathroom Design Result  
(Source: Domisilium Studio Archives)

### 3. CONCLUSION

Based on the explanation in Chapter III Result and Discussion, it can be concluded that the room occupied by humans and pets can be designed properly through considerations in terms of function and aesthetics. The difference in the category of living things does not become a barrier to the beauty of a residential space design, on the contrary it can be a new innovation that may not occur in the design thinking of a normal dwelling. In addition to a mixture of 2 categories of living things, from the results of this design it can also be seen that a small room can be well designed so that it does not feel stuffy and remains comfortable to live in on a daily basis. With a minimalist design and furniture, the room can be made to look attractive and clean. The difference in the use of the ceiling in an interior also did not cross the mind of the previous writer if he did not see this situation.

The advantage of this research is that the author can better understand how to design a residential space that contains 2 categories of living things. The author can also realize that the small size of the space does not determine how difficult it is to research, but what determines the level of difficulty of a research is how the topic is discussed in depth. The drawback of this study is the limited library resources for mixed zone dwellings involving humans and pets.

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