

Design and Development of Multifunctional Office Furniture During the Pandemic Era

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ABSTRACT

Corona Virus or usually called Covid 19 is a virus that has been spreading all over the world for more than a year. This virus originally came from Wuhan, China in early December 2019. This virus has a big impact in all sector, one of which is in the office sector. The main reason for the impact of the spread of the Corona virus in offices is the activities in closed spaces with poor air circulation. WHO (World Health Organization) also claim that the spread of the corona virus can be caused through the air. Therefore, the activities in the office are temporarily stopped or we can call WFH (Work from Home). However, it has been more than a week since the office activities have begun to be allowed after almost a year of implementing WFH (Work From Home) with a maximum capacity limit of only 25% of the total workforce according to the applicable rules. Therefore, to start new regulations according to the health protocol and minimize the spread of the virus, there are furniture with multifunctional concept and added partition or given more distance between furniture with the aim that workers are more protected from viruses and their work will also be more effective. This design was made using killmer method which consist of two parts, there are analysis and synthesis. This method was made so that the furniture was made according to the criteria. The application of this furniture is also very suitable for the work area because the design was made specifically for the work area only.

Keywords: Covid 19, Design, Furniture, Multifunctional, WFH(Work From Home),

1. INTRODUCTION

Covid 19 or usually called corona virus is a new virus who identified as SARS-Cov-2, which was first discovered in Wuhan, China in December 2019 [7]. This virus has been spreading for more than a year all over the world for more than a year. The impact of the corona virus is very large in all sector, one of those affected by the corona virus is in the employment sector. According to Kompas.com (2020), the increase in the number of new cases of corona virus infection in Indonesia in the last few days is come from office activities. *World Health Organization (WHO)* has also admit the evidence that the corona virus can spread through the air, especially in enclosed spaces [8].

The activities in closed spaces are riskier to spread the virus than outdoors area. In Indonesia, In the past week, many new cases that have been reported from offices.

Therefore, office managers and the employees who start their activities in the office are asked to increase their alertness [8]. For now, the new regulations regarding office capacity are also made with a maximum capacity only 25% to minimize the spread of the virus [2].

The Governor of Jakarta, Indonesia, Anies Baswedan (2020) said that office capacity was only limited to 25%. "As for government offices, in accordance with the regulation of the Minister of Administrative Reform and Bureaucratic Reform that in high-risk zones, it is allowed to operate with a maximum of 25 percent of employees. In the next two weeks, Jakarta will operate under the status of allowing 25 percent total of the State Civil Apparatus according to MenPAN-RB regulations," He said in a virtual press conference from City Hall, in Medan Merdeka Selatan street [2].

According to CNN Indonesia, the increase in the number of COVID-19 cases has reached five times higher than the standard set by the World Health Organization (WHO), which is 8.072 cases [1].

Therefore, to minimize the increase in the corona virus, the designer needs to make multifunctional furniture design and add the partition in order to reduce direct interaction among workers. So that the workers also feel safe from being infected by corona virus and also minimize movement when working, putting things, doing eating and drinking.

2. METHOD

2.1. Design Method

The design method used is the two-step method who created by Rosemary Kilmer. According to Rosemary Kilmer, the design process can be divided into two stages, there are analysis and synthesis stages [3].

At the analysis stage, there are several things that must be done such as identifying problems, operate, researching and analyzing problems. From the results of the analysis stage, it is usually made into programming, which is the stage before making a concept for the solution of the design. Meanwhile, the synthesis stage is usually done by generating ideas, creating concepts, and finally providing alternatives to choose from as the right solution to a problem [3].

At first stage, designers need to implement a *Commit*, which is the stage where the designer submits a survey permit to Manulife company which is used as the object of the design [3-4].

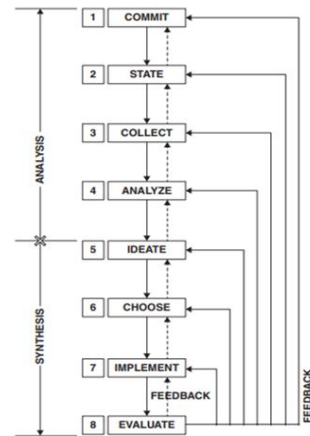


Figure 1 Design Method According to Rosemary Kilmer (Source: Designing Interiors, Rosemary Kilmer, 1992, p.178)

Then, do the *State* stage, which is the stage where the designer defines the problem, by making the background of the problem in furniture design. Before making a background, there are three techniques that need to be done before making a background, there are make a list of what needs to be made as a reference problem, take notes from different people's perspective, and make visual diagrams [3].

After that, do the *Collect* stage, which is the stage of collecting facts from the results of field surveys and collecting physical data from the Manulife company. Some of the techniques needed to collect data are through interviews, surveys from each user and looking for data through the internet as well as data from other people who have the same project as complementary data [3-4].

After collecting data, the designer will do an *Analyze* where the designer performs an analysis of the results of the data that has been collected. When to do analysis, what needs to be done is to create concepts in the form of sketches, matrix, and division of categories. It aims to find the point of the problem before designing furniture [3-4].

The next stage, the designer performs the *Ideate* stage, the stage where usually makes furniture design ideas by making several alternative concepts [4]. The process of making

ideas is usually through making schematics, and design sketches whose references can be through internet media but according to the existing problems [3].

Then, the designer does *Choose*, where the designer chooses an option from the results of the most appropriate ideas and according to the client's request. If it is still not right and not suitable with main problem, the designer needs to make other options until it reaches the right choice and according to the client's request [3-4].

After finding the right choice of furniture, the designer does *Implement*, the stage where the designer designs furniture from the result of ideas into 2D or 3D forms. The Illustration of furniture made in the form of final design drawings, plans

or construction drawings, renderings, and other forms of presentation. When it is suitable, the result image will be made into a 3D model either manually or digitally [4]. In addition, it is necessary to include budget costs so that the client can prepare the costs incurred [3].

At last stage, the designer needs to *Evaluate*, the stage where the designer re-evaluates the results of the designed furniture and adjusts it to the problem the first time. The designer usually gets criticism and make revisions. If it is approved, the designer will make a construction drawing of the furniture that is already in accordance with the results of the evaluation [3-4].

2.2. Parameter

Before designing an office desk, there are several requirements that need to be applied so that the office desk can be designed according to human ergonomics. There are: (1) The table surface to the floor is not completely covered so that air circulation goes well and the feet of the user who wears it does not feel hot. (2) The table surface to the floor is not completely covered so that air circulation goes well and the feet of the user who wears it does not feel hot [6].

(3) The surface of the table should not be shiny so as not to dazzle the user's eyes. (4) The area of the table is not too wide. The surface area of the table is adjusted to the position of the person who uses it.

Type	Length	Width	Height
Large Table	121,5 cm	71-80 cm	74 cm
Medium Table	96,5 cm	71 cm	74 cm
Ordinary Table	120 cm	70-72 cm	75 cm
Specific Table	Customize to the needs and functions used		
Meeting Table	Customize to the needs and functions used		

Table 1 Standard office desk size

3. DISCUSSION

3.1. Design Concept



Figure 2 Furniture Design Concept Mood board

The design concept in the design of multifunctional furniture is modern but does not leave a minimalist impression. The concept creates elements of style, theme, and material.

3.1.1. Style and Theme

Using the Modern Minimalist theme because it has a simple image but modern style. In addition, using natural colors so that users feel comfortable. The principle of using this theme, is “Simple materials for maximum results” which means only using a few materials but does not eliminate the aesthetic image of the furniture.

3.1.2. Material

The materials used are mostly processed wood materials such as Medium Density Fiberboard (MDF). The designers uses Medium Density Fiberboard (MDF) as the main material in this office furniture because according to the Low Cost Furniture Contributor (2018), MDF is environmentally friendly and relatively cheaper than plywood [10].



Figure 3 Medium Density Fiberboard (MDF)

Then the finishing section is given HPL (High Pressure Laminate) with a wood texture and softgrey colors. According to Dekoruma.com, High Pressure Laminate (HPL) is one of the most popular processed wood finishes, because High Pressure Laminate (HPL) has many variations, and installation is also easy [9].



Figure 4 High Pressure Laminate (HPL)

Most of the connections use screws and the drawer is left open to minimize cramping in the work area.



Figure 5 Screws for connection between wood

3.2. Final Design



Figure 6 Multifunction Furniture

This furniture is made with a multifunctional concept with the aim that users do not need to spend time going to the locker area to pick up items. This furniture is also made with a cubical concept in accordance with current evolution, such as covid 19. Making with cubical concept has the aim of minimizing the spread of the virus directly so that users feel safe and comfortable.



Figure 7 Office table

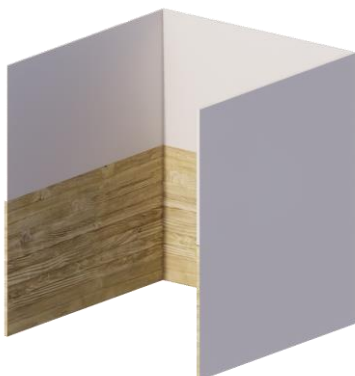


Figure 8 Partition

This furniture has a design of two forms that are combined into one to form multifunctional furniture that is cubical considering the evolution that are happening now. This Furniture can be disassembled so that when the furniture wants to be moved, there are no need to move everything at the same time. The material used is also simple, only using MDF with HPL finishing so that it gives a natural and unobtrusive impression.

The advantages of this furniture is that it can be used as a work area, then it can also be used as to store item such as files as in **Figure 9**, and can put supplies or a drink in the places that shown in **Figure 10**.



Figure 9 that drawers is used to store things



Figure 10 rack is used to put food or drink

Meanwhile, in partition selection on **Figure 11**, there are additional of shelves so that users can put decorations so that the working atmosphere is more lively and not too monotonous.



Figure 11 Partition

4. CONCLUSION

Multifunctional furniture is furniture that has more than one function. The purpose of making multifunctional furniture is to save space, improve time efficiency, and save costs [5]. In the design of multifunctional furniture for the office, it is made with the aim of functional furniture in carrying out office activities such as putting things, writing, storing things, and others. In addition, this furniture aims to follow developments in pandemic era. Many offices have re-opened work activities in the office or called WFO (Work From Office). Even though Work From Office has started, it still has to follow the rules, such as the governor's Regulation Number 3 of 2021 articles 11, 12, 13, 14 which contain about 75% of employees Working From Home (WFH) and another 25% may work in an office. In addition, one of the right solutions to minimize spread of the virus during Work From Office (WFO) is to make multifunctional furniture or with partition additional so that the users feel safe and more efficient when carrying out activities because they carry out several activities in one place.

In the design of this furniture, it is designed with multifunctionality so that users do not need to spend time picking up files or taking things from the locker, because there are drawers on the office desk to put files and other items. This multifunctional furniture is also useful to minimize the spread of the corona virus.

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