Preparing post Covid-19 pandemic office design as the new concept of sustainability design

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Abstract. The Covid-19 pandemic has affected human behavior. It brings changes in many aspects of life that staying at home becomes a new normal. People do physical distancing to stay safe and healthy. Employees work from home to remain productive as professional responsibilities to the company. Sustainable design has been a trend in office design. The basic idea of sustainability is to reduce the negative impact on environment and health by creating a design that empathizes with its surroundings. When physical distancing is applied in layout furniture, it reshapes the office design. This topic is interesting to discuss since companies consider to increase hygiene standards while designers prepare the new concept for office design in the post Covid-19. The collected data contained information that needs to be considered in developing the interior for a workspace. The data obtained were from various sources related to this Covid-19 pandemic. This research was conducted through descriptive research, in which the collected data described the phenomenon studied around the world and how designers prepared for the new normal for office design. Based on the study, it is expected to determine the new working standards for office design and explain them to interior design students as the course material in interior design subject in designing for public space.

Keywords: post Covid-19 pandemic office design, new concept of sustainability design

1. Introduction

The Covid-19 virus has become a pandemic that affects the lives of millions. To prioritize public health in the Covid-19 pandemic, the officials are implementing physical distancing (including orders to stay at home), restricting travel, and closing the nonessential businesses [1]. It also happened in Jakarta, Indonesia. The Governor of DKI Jakarta, Anies Baswedan, has issued a policy No. 20/SE/2020 regarding extending work from home and closing the office due to the Covid-19 outbreak [2]. This pandemic has change personal interaction and made working from home become a new normal. People need to focus on their health and do physical distancing by staying at home.

Before the pandemic, office design trends developed the open workspace, that supported the collaborative work concept. The co-working space concept is considered to have high flexibility towards employee mobility, which strongly supports efficiency and effectiveness in a company. A long working table in an open space has replaced the cubicle workstation that greatly limits the space with high privacy. A sustainable design concept is applied using sustainable material. How to use the
space efficiently is by opening the partition that limits the space for employees, so they can blend in a more relaxed atmosphere while still providing the best performance.

The company has to support the mobile way of working, and people are struggling to adapt to work from home as their new lifestyle. They must be able to adapt immediately as professionals since working from home is the only solution for this period. The competence in using application and technology which enables to work anywhere and anytime become fundamental. According to Leon C. Megginson, it is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to changing environment in which it finds itself [3]. When flexible working hours becomes a new way of life, the duration of working hours, family time, and leisure time are biased. It has the potential to cause other problems related to human behavior in adapting this pandemic situation.

Hopefully, this pandemic will end soon. There will be a time when people are going back to the office to work, but it will never return to a pre-2020 mode. There will be a significant adjustment to this new era. There will be rules to guide how to use public spaces and transport. The increase in hygiene standards will be maintained, as employee’s health becomes an important company value [4]. When physical distancing is applied to layout furniture, it will reshape the office design. That is why designers have started to plan the new concept of sustainable design in office design post Covid-19 outbreak. Several things are considered to be improved in office design. With or without government policies, this will become a consideration for companies to prepare the workspace within the office design.

While trends come and go, sustainability design has brought people to the new phase that humans should live in harmony with their environment. Office design has been built for years, and it improves in every era to adapt the human behavior at the workspace. The sustainability design concept reduces negative impacts on the environment, health, and comfort of user building by improving the building performance [5]. In addition, sustainability is a design approach, not a style. This concept aims to improve the quality of human life in creating a balanced solution to environmental problems, comfort, aesthetics, and costs [6]. Design for sustainability offers a new and broader context in designing, such as responsible, synergistic, contextual, holistic, empowering, restorative, eco-efficient, and visionary [7].

This topic is interesting to discuss since all companies will consider improving their existing layout to welcome all the workers back to the office. From the discussion, it is possible to have a new standard for office design while the sustainable design concept is still relevant to be applied. This paper will describe how designers have thought about the solution for office design post Covid-19 outbreak.

2. Methods
This research is conducted through descriptive research. The collected data describe the phenomenon studied. This phenomenon of Covid-19 pandemic has affected many aspects of human activities in everywhere around the globe. The lockdown policies throughout the world impact local policies to stop the activities in schools, offices, shopping centers, and religious houses. It will answer what, when, where, and how question but not why question. The three main purposes of descriptive studies describe, explain, and validate research findings [8]. This research focuses on office design, and how it adapts to the new normal. It will discuss how the Covid-19 outbreak will impact the new concept of office design and how sustainable design is still relevant to be applied. The outcome of this research is to give an insight into how office design changes in responding to the importance of health and safety for the workers in a workspace. Hopefully, it also will improve the working standard of office design that can be used for course material in Interior Design course for designing a public space.

3. Discussion
The change has taken place, and this moment will be the history of how human being tries to survive during the Covid-19 pandemic around the globe. The outbreak was declared a Public Health
Emergency of International Concern on 30 January 2020, and WHO announced the name for the new coronavirus disease as Covid-19 [9]. Covid-19 was officially named by the WHO. Based on the analysis of respiratory samples, the expert declared this pneumonia was caused by a novel coronavirus [10]. Individuals need to take protective measures that effectively prevent the infection, including improving personal hygiene, wearing masks, resting adequately, and having good ventilation. Several reports have suggested that person-to-person transmission occurs primarily through close contact or droplets spread by coughing or sneezing from an infected individual [11]. Up to now, neither vaccines nor medicine has been found to prevent people from the infection of Covid-19.

Based on the international conference for interior designers, it was stated that there was a change in the percentage of public and private areas in designing office interior. Historically, 70-80% of the space in an office is dedicated to individual space called the “I” space, and only 20-30% is “We” space. Nowadays, the “I” space needs only 30-40%, and “We” space needs 60-70%. The space is not necessary to lead to transformation, but it needs to support transformation [12]. The transformation happened to adapt to technological inventions. They have provided more convenience in the work process to run effectively and efficiently. Efficiency is doing things right, and effectiveness is doing the right things. The “We” space has been applied in an open workspace design that supports the collaborative working style.

For the last few weeks, people stay at home and begin to adapt to work from home activities as the new normal. The companies that have been allowing employees to work from home see that working from home in many cases goes well, and people are still productive. It is especially for the company that has qualified technology in supporting work from home activities. However, people need social interaction, and meeting face-to-face still has an emotional impact. There are advantages to go to the office. The employees can read each other’s body language and recognize people’s faces and voices. Somehow, it can build trust and bond with each other. It will enhance the sustainability of the work environment, which can not be done by virtual meetings. Specifically, for those who work within a team, the in-person time is important [13].

Other than that, there are still employees who lack the resources to work successfully from home, struggle to access the technology to complete their work, or live in areas with no cellular service. The company has responsibility in determining the policy of back to the office, and people need to feel safe about it. Employees will return to works in turn, and essential employees will return to the office first. Alternate working hours divided into shifts will organize the number of people in the office at the same time.

Although there have not been many references of journals focusing on how Covid-19 affects office design, the discussion of paving the road back to the office has been shared through several webinars, interviews, and e-papers from the designers around the world. Employee’s health is going to take center stage, and a shared environment will have new procedures to protect workers from infection and disease. It is found that there are certain measures in the design of workspaces and furnishing to protect employees and prevent the further spread of this pandemic.

From the data collected, there are several considerations in designing ‘a Covid-19 safe’ office.

3.1. Office workstation
Safe works setting called six feet office, where the distance between individuals in the workspace should be at least 2 meters or 6 feet [14]. It can create a new configuration in the layout furniture at the workspace. People will not be sitting face-to-face but back-to-back. The table arrangement will set on the checkerboard or zigzag pattern. The office desk has shrunk from 1.8 m to 1.6 m to now 1.4 m and can be less. There also might be panels in between to protect individual employees. In Figure 1 and Figure 2, these are the sort of arrangement of workstation that adapts to the new consideration of furniture layout in the post Covid-19.

The previous arrangement in the office before the pandemic generally has an open workspace system that eliminates separation walls. It supports the collaboration and communication between
divisions within the company. The open workspace allows the workers to have more interaction and open the gap of communication and distance. This behavior has a positive impact on the company, but since the pandemic adjacent seat position that is facing each other needs to be rearranged to reduce the risk of transmission of the Covid-19.

Figure 3 is a workstation design from Vitra, an office design specialist from Switzerland. It is one of the workstation design that has been applied to the post Covid-19. It has a safe design and uses the high separation screen as a partition between two workers.

3.2. Wider corridor with one-way foot traffic and doorways
One-way foot traffic is moving in a single direction. It can be done by setting one-entrance and one-exit door. It will evade the two-way traffic that has a high risk of accidentally or unintentionally contacted. The minimum width requirement in a corridor is 1.2 to 1.5 meters for two people able to walk in the alley. Internal infrastructures and transit zones should be adapted to maintain sufficient distance between employees.

3.3. Cleaning station
To prevent the transmission of the virus in the office area, the company also plays an active role in improving hygiene standards at the workspace. It is to maintain employees’ health and the company’s productivities.
3.4. Touchless control system
Self-opening doors and elevators that respond to voice instead of touch buttons will be installed. The company may need to invest more in the new system of contactless technologies to reduce disease transmission. Technology can be used as a reminder to the employees of social distancing.

3.5. Better air filtration
Good ventilation is the key to prevent the spread of Covid-19. It can be done by simply opening the window, but there are many sealed offices. It requires communication and cooperation with building management since it certainly impacts the architecture building and the policies that apply to building tenants.

3.6. Remote works
Regular remote work can reduce office space density. Working remotely will become common. There will be an option for flexible working hours from shift working models to 3-to-2 models. The 3-to-2 means 3 days at work and 2 days at home in one week [15]. Thus, allowing remote working will give the company access to the global talent pool.

3.7. Antimicrobial materials with easy to clean surfaces
There will be more cleaning protocols and procedures, which the company will do more to make employees aware of how they are cleaning the spaces. The easy wipeable tables and chairs will be used, such as High-Pressure Laminate (HPL), melamine, metal, and Medium-Density Fiberboard (MDF).

3.8. More signs
Signage is used for direction in the lobby as the standing spot in the elevator. The floor and wall of the office will be covered with signs as visual instruction. It is possible to use signage to encourage employees to walk clockwise with the one-way flow to minimize transmission, adapting what happens in the hospital during the pandemic.

3.9. Reducing the open space
Some offices have to reduce the amount of seating in the lounge and conference room. At the same time, the other prefers a video conference to communicate with each other to avoid the conference room. There will be less unassigned seating because people will be worried about sharing a workspace with others, and people do not have to sit side by side [16].

Based on a modern concept by Frank Lyloyd Wright, the early 20th-century architect and designer believed that design would democratize the workplace by tearing down walls literally and socially. Through the years, the open office arrangement has become common as both design trends and cost-saving measures known as sustainability design. His basic concept is to emphasize natural light and space between the desk [17]. Some studies were done in 2018 regarding the open office concept applied to several companies. It found that face-to-face communication declined 70 percent while electronic communication increased. Another study also showed that the fear of infection in the crowded space made psychology stressful. The discussion of preparing the post Covid-19 safe office becomes the topic for companies and designers. The company thinks about how they may change their workspace. Some experts said that open space plans could be redone with better consideration for personal space and regular cleaning schedules.

Figure 4 is an office layout adopt from Vitra. E-paper is based on their office design project. This picture describes how the furniture layout in the office has 64 workers in 371 sqm before the Covid-19 pandemic. The workstation has a capacity of 25 seats with a face-to-face position and no partition between the workers. There are six seats in the meeting room and six seats in the cafeteria that sit side by side. Based on this space, Vitra has proposed a new office layout by applying the consideration of
post Covid-19 safe design, as seen in Figure 5. As seen in Figure 4, the office layout uses the open workspace concept, with only a meeting room with a full partition in the area.

This is the adjustment layout for post Covid-19 safe office. In general, the space still has the same zone for each activity, including the cafeteria, meeting room, workspace, and manager area. There are dancing wall, a mobile partition that can be used to divide offices into zone flexibly. It consists of a metal frame that can be equipped in various configurations as a bookshelf, TV unit, plant room, or room divider with removable whiteboards and pinboards [18]. In Figure 4, the capacity of the workstation is 64 seats, but in Figure 5, it is reduced to 25 seats by using zig zag and checkerboard configuration. In addition, the workstations have high separation screens as table dividers. It is applied to the 6 feet office to maintain the physical distancing in the workspace. The meeting room only has three seats to minimize the transmission of the disease. The cafeteria still has eight seats that each table is separated from one to another. The open-plan office layout is still suitable for the post Covid-19 design, as long as the arrangement applies the 6 feet rules. Table 1 shows the changes for the design.
Table 1. The Changes in Design Office.

|   | Description                                      |
|---|--------------------------------------------------|
| A | Increase spacing between workstation             |
| B | Reduce the number of chairs to reduce the occupancy rate |
| C | Use high separation screen as table dividers on workstation |
| D | Use dancing wall as mobile partition element      |
| E | Alternate the seating at workstation             |
| F | Increase the distance between desks and add 3D screens |

This consideration relates to sustainability design since the approach to reduce the negative impact on the user, and its environment becomes the focus of the design. The increase in hygiene standards has a direct impact on developing a healthy environment in the workspace. The adjustment made to create new standards in office design supports the post Covid-19 safe office.

4. Conclusion

The changes that occurred for post Covid-19 safe office design aims to prioritize employee’s health by increasing hygiene standards in a workspace. Considerations are made to provide harmony between the employee and its environment to improve the quality of the work environment. The effort to reduce negative impacts on the environment have been carried out to create sustainability in office design. Therefore it can be explained that the sustainability design concept is still relevant to be applied to the post Covid-19 office design. The discussion above has mentioned several aspects that need to be considered in re-layout a workspace in preparing post Covid-19 office that is safe and healthy. The physical distancing will be applied in the office area. Paying more attention to health and hygiene factors will be mandatory to support the health and safety of the workers in companies. This topic of post Covid-19 office interior design will be continued to develop in terms of material and finishing innovation and layout furniture to solve the problems and prevent the spread of viruses in the workspace.

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