

## Co - Working Spatial Changes in Response to Pandemic Issues Study case in Yogyakarta, Indonesia

Ravida Maulidina<sup>1</sup>, M. Galieh Gunagama<sup>2</sup>

<sup>1,2</sup> Department of Architecture, Universitas Islam Indonesia,

<sup>1</sup>Surel: 17512135@students.uui.ac.id

**ABSTRACT:** *In March 2020, the World Health Organization officially announced the COVID-19 outbreak as a global Pandemic (WHO, 2020). The first step from government to respond this issue is by holding a local lockdown in their area. People are prohibited from leaving their house and required to do all of their activities inside their house. These new habits and activities of course lead to the changes in the functions and requirements of space including to the one of public space, Co-Working space. In this era, most people prefer to do or finish their job outside especially in the Co-Working space rather than inside their house to gain more ideas. And since the new normal era has begun, lots of design changes have occurred following and responding to the pandemic problem. What changes have occurred due to changes in people's behavior during the pandemic? How to design a Co-Working space that is suitable for the present and for the future?*

**Keywords:** Pandemic, Space, Behaviour, Psychological, Co-Working Space.

### Introduction

In early 2020, the world has been shocked by a new virus which spreads very fast and has been worldwide. The virus is covid-19, first discovered in Wuhan, China and was reported to be detected on 17 November 2019. This virus is increasingly spreading to almost all parts of the world including Indonesia, which was detected for the first time on 2 March 2020. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. The virus irritates the respiratory tract and can spread easily through many media causing people to maintain their distance from each other or most known as physical distancing.

Various attempts and efforts have been made to cope with the virus and simply reduce its spread or transmission. Half of the world's population has been asked to stay at home or restrict movement in public (Sandford, 2020). Unfortunately, the virus has not yet subsided and because of the current pandemic situation, so far, many changes have occurred, such as changes in human habits and activities. Those who usually gather to have a light conversation and activate their social life, now have to apply social distancing to maintain the health of each individual and those who usually do many activities outside the home now have to do everything inside the house. These new habits and activities of course lead to the changes in the functions and requirements of space.

Seeing from the previous incident, a pandemic like this has also occurred and also discovered first in China in 1955, namely bubonic plague or mostly known as black death. The impact is not only changed the design of the plumbing throughout the building but also changing the aesthetical aspects of each room. The design of the room at the time turned to all white and increasingly focused the appearance of sunlight. Not only that, the bathroom floor began to use ceramics and bright white paint began to be used in all corner of the space.

It can be ascertained that this pandemic, COVID-19, will also change the spatial design of space. Especially in public place, which has lots of people from nowhere in one area that will directly or indirectly make contact or interaction. In response to this current situation and future needs, the spatial changes of public space is quite important in order to anticipate the same problem in the future.

In this era, public is really familiar with Co-Working space especially the millennials. The official first Co-Working Space itself has opened its door in San Fransisco on August 9, 2005. The development of the function of the building is very fast and now we can find it literally everywhere. In this era, most people prefer to do or finish their job outside especially in the Co-Working space to gain more ideas and having new atmosphere also to keep them being productive. The development of co-working spaces is also rapid in the world term in line with the many needs. Based on the website, *allwork. space*, The number of co-working spaces worldwide is projected to reach almost 20,000 in 2020. Quoted from CNBC, Prior to the pandemic, co-working spaces were the fastest-growing type of office space in commercial real estate. While they currently comprise less than 5% of the market, they're expected to make up 30% by 2030. The total provision of all flexible space, including serviced offices and co- working, grew 18% globally in 2016. Growth of co-working and "hybrid space" has doubled globally since 2013. Co-working and hybrid space now accounts for a third of all flexible space across the world.

The paper directly responds to the impact of the pandemic issues associated with the spatial changes of Co-Working Area. Knowing the layout patterns or forms of spatial changes in the Co-Working Area in order that will occur during or after the pandemic ends by knowing the relationship between space behavior also the factors of spatial layout changes. Taking into consideration about the aspects of psychology related to the anticipation in the scope of architecture.

### **Problem Formulation**

1. What changes have occurred to the spatial layout of co-working spaces during this pandemic?
2. How to design a Co-Working space that is suitable for the present and for the future?

### **Research Purposes**

#### General Purpose

Knowing the layout patterns or forms of spatial changes in the Co-Working Area in order that will occur during or after the pandemic ends.

#### Special Purpose

- Knowing the relationship between space and human behaviour.
- Knowing the factors of spatial layout changes.

### **LITERATURE REVIEW**

#### **Relationship between Space and Human Behaviour**

Public life studies often count people in streets, parks or squares in order to assess use patterns and evaluate how the site is functioning (Gehl 2013, Anderson et al. 2018, City of Vancouver 2018, Akaltin et al. 2019). In a few cities, the pandemic might also additionally display a ruin from the beyond, and pedestrian patterns that depend on

beyond statistics may want re-calibration since there are some habit changes in our daily life. In a post-COVID world, how may we alternate how we accumulate and interpret statistics on public life? According to Gifford (1997, cit. in Gunther, nd), Environmental Psychology is "the study of transactions between individuals and physical space in which individuals modify the environment and in its turn, behaviour and experience are affected by this". Space is one of the elements of design of architecture, as space is continuously studied for its usage. Architectural designs are created by carving space out of space, creating space out of space, and designing spaces by dividing this space using various tools, such as geometry, colors, and shapes. The space itself is closely related and interrelated with human behaviour. Human behavior habits can have an impact on the space forming and functional aspect. Human behavior can change over time by time. One of the causes of behavior change can also occur due to a pandemic situation. The form and space requirements will change with the aim of fulfilling the needs of the users of the building according to the various activities undertaken.

The basis of planning has to be a vision of public life in the given area. Who are its potential users? What activities would take place in it? What kind of life can develop there?



**Picture 1.1** Human behaviour in life affects to space and building maketh

Source:<https://gehlpeople.com/wpcontent/uploads/2018/05/Life-Space-Buildings-landscape.jpg>

The strategic guidelines of Gehl Architects were selected and applied in the context of studies, workshops, public consultations, lectures and conferences. The road to creating successful spaces begins with putting people first. Different behavior could create different needs.

### **Architecture Post-COVID**

Reconsider the concept of home: As we go through the various stages of the pandemic, we will once again focus on our intimate places. In fact, new configurations and new plans are emerging. The quality and comfort of our homes will be at the top of the world list while we are locked in our homes, we consider our requirements and needs together with the "new normal": roofs that can be used by green areas and gardens, daylight and ventilation balconies and terraces. Also healthy interior transition and filter inputs etc.

New parameters: Concentration on health-oriented approaches. New standards are set. Design and materials are rethought according to the current situation and new ways of life are created. As ideas of modular design pre-fabricated elements, flexible partitions, and lightweight structures continue to grow, architects begin new configurations by considering socially distancing measures, surfaces are covered with materials that prevent the spread of disease, and the design will be aimed at eliminating the risk of transmission. Based on WHO website, there are also several way to keep yourself and others safe from

COVID-19. The first one is by maintaining at least 1meter distance between yourself and others in order to reduce the risk of infection when sniffing or talking. Keep an even greater distance between yourself and others when indoors. The further away, the better. Next is by using a mask and keep your and your things sterile by using hand sanitizer or alcohol based antiseptic.

**METHODOLOGY**

The main purpose of this paper is to find out what spatial changes are happening in a public space related to the current Covid-19 pandemic issue. The public space studied is a co-working space. The method that will be used in this research is ex post facto. An ex post facto research design is a method in which groups with qualities that already exist are compared on some dependent variable. In the context of social and educational research the presence of the fact or retrospectively and referring to those studies with investigated possible cause-and-effect relationship by observing an existing condition or State of affairs and searching Back in time for plausible causal factors. The method is by comparing the past and present situation also by considering the COVID-19 space guidelines. In this comparison, I will compare some co-working spaces in Yogyakarta that I have been to before Covid-19 spread and will compare the layout or furniture of those places before and after this pandemic started to find out what layout changes are happening in the room. There are also correspondents in order to collect more data to be analyzed in order to find out the changes that occur in the Co Working area during the pandemic in their perspective also to find out which layout can make them or visitors feel more comfortable and safe.

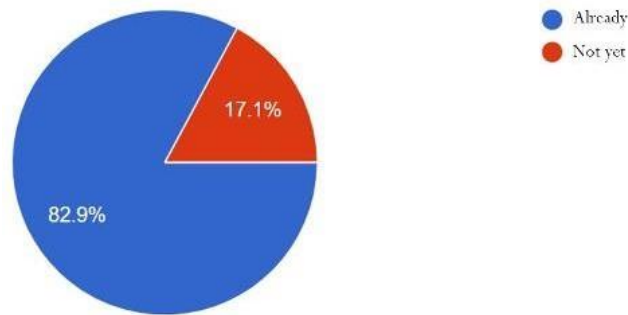
**Tabel 1.1** Research Design Matrix

Research Purposes	Analysis Unit	Parameter	Data Collection Method	Data Compilation	Analysis Method	Result
Knowing the spatial layout that have occurred in the co-working space during the pandemic	New normal activity & human behavior	Spatial layout & furniture arrangement	Participant observation & questionnaire	Schematic design, bubble diagram, and ordinal data	Ex Post de facto ( before-after comparison )	Spatial layout patterns in response to the pandemic
How to design new normal layout for better co-working spaces	Human behavior related to the architecture and psychology	Covid-19 requirements	Questionnaire	Binary data	Description and conclusion	Future co-working space design guideline

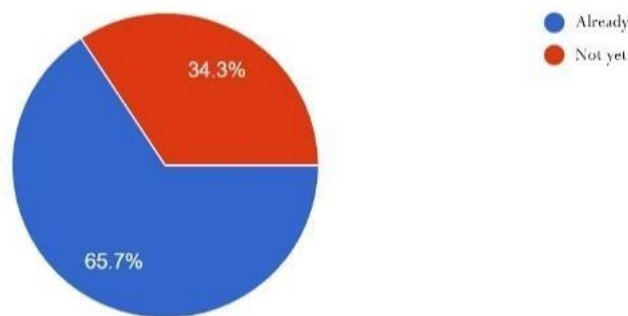
## RESULT AND DISCUSSION

### 1. Diagram

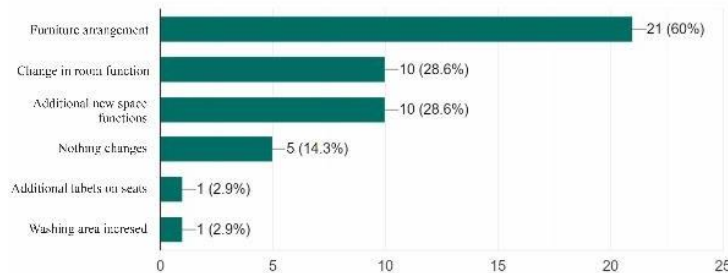
**Diagram 1** Co-working space compliance with health protocols



**Diagram 2** Co-working space visitor compliance with health protocols



**Diagram 3** Changes that occur in co-working spaces in terms of architecture



Based on the diagram above, most of the respondents chose furniture arrangement on the changes that occur in the co-working space during the pandemic. And the second most common choice is the change or addition of space functions. Based on the data, changes or additional functions of space that occur is the space for washing in order to sterilize the users.

### 2. Table

This table shows the respondents perspective on how to create suitable co-working design for the future in response to this covid-19 pandemic situation.

**Table 1** Disinfectant Area  
X1

Valid	P	Frequency	Percent	Valid Percent	Cumulative Percent
	P	7	23.3	23.3	23.3
	SP	23	76.7	76.7	100.0
	Total	30	100.0	100.0	

From the results of the respondent's statement above about the importance of placing a disinfectant area in a co-working space, it shows that most respondents choose very important and important as the most chosen answer afterwards, that means interpreting the importance of the existence of a disinfectant area in a co-working space. The example of this point is occupy a tap or hand sanitizer that located at the entrance gate nor at the cashier table.

**Table 2** Minimum Distance between Visitors' Tables  
 x2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TP	1	3.3	3.3	3.3
	N	1	3.3	3.3	6.7
	P	8	26.7	26.7	33.3
	SP	20	66.7	66.7	100.0
	Total	30	100.0	100.0	

From the results of the respondent's statement above about the importance of minimum distance between visitors' tables or furniture arrangement in a co-working space, it shows that most respondents choose very important as the most chosen answer, that means interpreting the importance of minimum distance or range in each table or furniture arrangement in co-working space in order to implemented the physical distancing between one person to another.

**Table 3** The Boundary Line determines the Distance of the Queue  
 x3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TP	1	3.3	3.3	3.3
	N	1	3.3	3.3	6.7
	P	7	23.3	23.3	30.0
	SP	21	70.0	70.0	100.0
	Total	30	100.0	100.0	

From the results of the respondent's statement above about the importance of minimum distance between visitors' tables or furniture arrangement in a co-working space, it shows that most respondents choose very important as the most chosen answer, that means interpreting the importance of boundary line as a sign for people to stand while waiting their turn to order in response to pandemic issue which guaranteed people to maintain their physical distancing toward others.

**Table 4** Natural Lighting  
 x4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TP	1	3.3	3.3	3.3
	N	5	16.7	16.7	20.0
	P	7	23.3	23.3	43.3
	SP	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

From the results of the respondent's statement above about the importance of minimum distance between visitors' tables or furniture arrangement in a co-working space, it shows that most respondents choose very important as the most chosen answer, that means interpreting the importance of natural lighting resources with windows optimization.

**Table 5** Natural Air

**X5**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	3	10.0	10.0	10.0
	P	10	33.3	33.3	43.3
	SP	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

From the results of the respondent's statement above about the importance of minimum distance between visitors' tables or furniture arrangement in a co-working space, it shows that most respondents choose very important as the most chosen answer, that means interpreting the importance of natural air resources with openings such as ventilation optimization.

**Table 6 Outdoor Area**

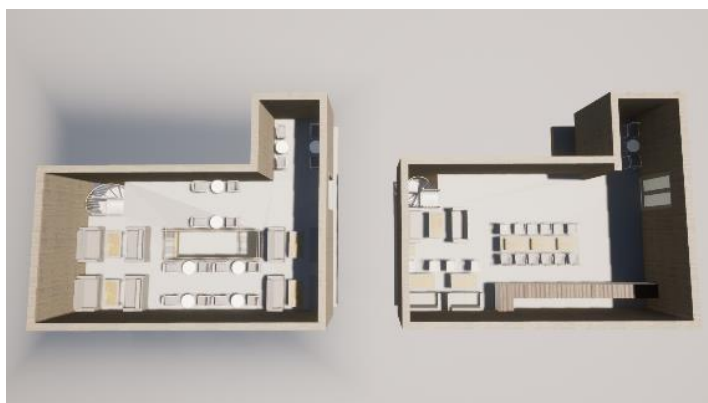
**X6**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	6	20.0	20.0	20.0
	P	12	40.0	40.0	60.0
	SP	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

From the results of the respondent's statement above about the importance of minimum distance between visitors' tables or furniture arrangement in a co-working space, it shows there are two answer which have similar amount of respondents, important and really important. This means that the provision of outdoor area for some people is considered neither so important nor crucial in a co-working space.

### 3. Figures

Shows the before and after pandemic affects through several co-working space layout or furniture arrangement in Yogyakarta, Indonesia based on observant participation.

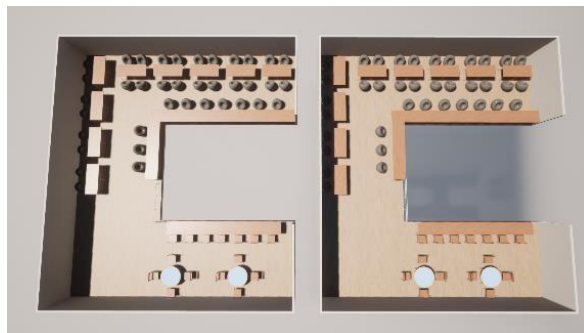


**Figure 1** Brick Cafe

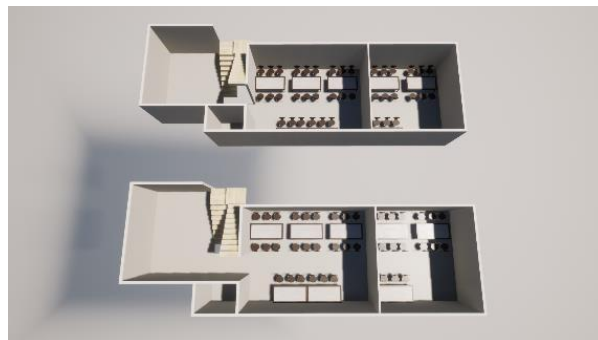
Source: Author



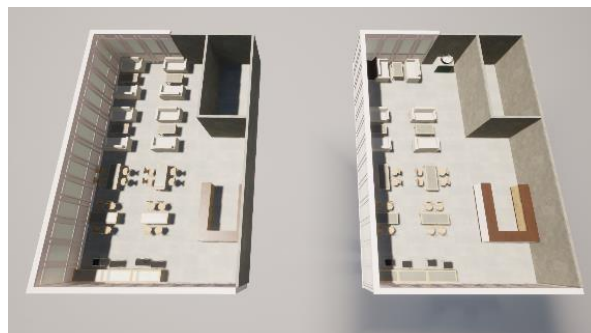
**Figure 2** Peacock Cafe  
Source: Author



**Figure 3** Praja Co-Working Space  
Source: Author



**Figure 4** Behive Co-Working Space  
Source: Author



**Figure 5** Fasade Coffee & Space  
Source: Author



Based on the figures above, only several co-working space that has a changes in their furniture as well as their layout arrangement in response to this covid-19 pandemic. The most noticeable layout changes from one of the comparisons above is brick cafe. The rectangle that located in the centre of that room is basically such a void before, but after this pandemic spreads they cover it and use it as a new space to place a chair and a table in order to widen the space. Another changes is located in the right bottom coner, what was once filled with tables and chairs for users, now is being replaced with an additional bar. The distance between visitor seats is also limited at least more than 1 meter.

In addition, a define change in each co-working space is the addition of washing area as found on fasade coffee and space, they added some wash basin on the corner of its room that before was just an empty space filled with some displays.

## **CONCLUSION**

The Covid-19 pandemic does not only affect the lives of humans themselves, but we can see and feel the impact in an architectural aspect, such as changes in the layout of co-working spaces caused by changes in behavior patterns of humans themselves. The results obtained from the data show that 60% of changes that occur in a co-working space are in changes in furniture layout and 10% of changes that occur are in the addition or change of room functions such as the addition of a washing room. It can be concluded that the theory applied in this paper regarding the relationship between behavior and space has a point. More details are found in the behavior of washing hands when it adds another new space function to a co-working space. And for the design recommendation, based on the data there are some important point such as the addition of disinfectant area or washing area, the layout arrangement by considering the minimum range between each table also considering the natural air and lighting inside.

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