

Effect of Co-working Space Designs to Business Development and Increasing User Interest

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Abstract. The purpose of this research is to know about the ambiance of the workspace that will affect a person in doing his work in order to create a flexible workspace but still provide a high level of productivity for users. In addition, the readers can know the criteria of design co-working space that can increase the user attraction to use the facilities and co-working space facilities that benefit from good co-working space design for users to give influence to the user on business development and financial aspects. Writing this research begin from several definitions of co-working space, type and typology, and facilities that are in co-working space. The research method is using literature study approach method which is used to analyze how and what are the criteria of good co-working space design as to increase user appeal and develop business from the financial side. The results of this analysis will show that the design of good co-working space will increase the attractiveness of the user so it has the potential to be used as a business space that can be used as a rental office for its users.

1. Introduction

Co-working space is hosting, work, and meeting places for entrepreneurs who are projecting carriers and ideas and want to share with others [1-3]; this place is supported by a special animation that is meant to make all become well-connected inside and outside the community. [4] Co-working is a rapidly emerging workplace phenomenon characterized by an open space work environment that lies between working from home and working in a traditional office environment. [5] Bilandzic, M., & Foth, M. Has explained the various motivations of co-working space users as a place to work as a place to share their experiences and knowledge. [6] Work intensification can occur where changes in work organization allow people to work harder with ease. In the case of long-distance work, it could be increased work intensity when away from work making it easier for people to work harder or longer. [7] Working of the cluster is necessary because there are more women, the same couple working, single parent families and people assuming parental care responsibilities at work [8].

Over the past few decades, the world of work and employment climate has been largely shaped by the restructuring of the value chain. In many industries this restructuring has occurred is characterized by outsourcing jobs to contractors and subcontractors, and offshoring employment to low wage countries. [9] Moriset, B. Arguing that the idea of the worker model is a critical self-diagnostic counsel on honesty management, I argue that it provides an inadequate perspective on labor and the so-called creative economy as far as closing capacity to compete among the labor force represented [10].



2. Method

The method in this research is using literature study approach which is used to analyze how and what are the criteria of good co-working space design so as to increase user appeal and develop business from the financial side. The study of literature used to analyze and seek information and knowledge about the ideal co-working space and to determine what the criteria make the requirement for a good and ideal co-working space.

The study of literature was also used to analyze the impact of the design of a space on its users, in relation to a co-working space that is how a space design and facility will affect the interest of workers and increase one's productivity. In addition, literature studies are used to describe some of the design criteria of an ideal workspace viewed from architectural aspects such as anthropometry, ergonomics, noise levels of a space, ambient lighting, air circulation, activity circulation, level of space requirements and other space requirements.

3. Results and Discussion

Co-working space is a workplace environment used to perform work and aims to facilitate startups and freelancers. Co-working space is not just a place physically, but a place to build a good community for co-workers.

Co-working space, which is a flexible work tool, must have a design criterion that suits the needs and standards of the user. Coupled with a dynamic workspace, work support, and entertainment facilities must also be available in order to improve the productivity of the work of Co-working space users, in this case, a Co-working space must meet the architectural aspects that have become necessary to create workspace the good one.

Some architectural aspects that need to be emphasized in a room are lighting, noise, air circulation, activity needs, anthropometry, ergonomics, and others. The psychological influence that users receive from a good and ideal workspace is to increase the work productivity of a person.

In addition, economic factors and the provision of facilities to increase the attractiveness of users in using co-working space also need to be emphasized to improve the business development of a creative city with its many startups and young workers who need a flexible and dynamic workspace.

Here are the aspects that can increase the user's appeal in the use of co-working space:

1) Design aspect

- Anthropometry
- Ergonomics
- Lighting
- Noise
- Air circulation (ventilation)
- User circulation
- Activity needs
- Level of space activity

2) Business and economic aspects

- Facilities
- Operational hour
- Price range
- User target

3) Design aspect

3.1. Anthropometry

Anthropometry is a science that studies the measurement of human body dimensions and special characteristics of the body relevant to the design of tools or objects used by humans.

In general, anthropometry is divided into two parts:

3.2. Dynamic anthropometry

Measurements are made by observing the movements that occur when the individual is doing the movement.

3.3. Static anthropometry

Measurements are made when humans are in a state of silence and linear on the surface of the body or do not do the movement.

In a space, anthropometric aspects or measurements of the dimensions of the human body are essential to creating a good space, the things that need to be considered in designing the workspace are as follows (Figure 1).



Figure 1. The proportion of the human body.

The dimensions and proportions of the human body affect the proportions of the objects we hold, the height and distance of the objects we achieve, and the dimensions of the furniture we use to sit, work and more. It also affects the good and ideal workspace so it can increase work productivity.

3.3.1 Anatomic motion capability. The anatomical motion of the human neck is about 30° and above and 40° down or to the side, so it takes the facility to pay attention to it so that the users of the workspace feel comfortable in moving (Figure 2).

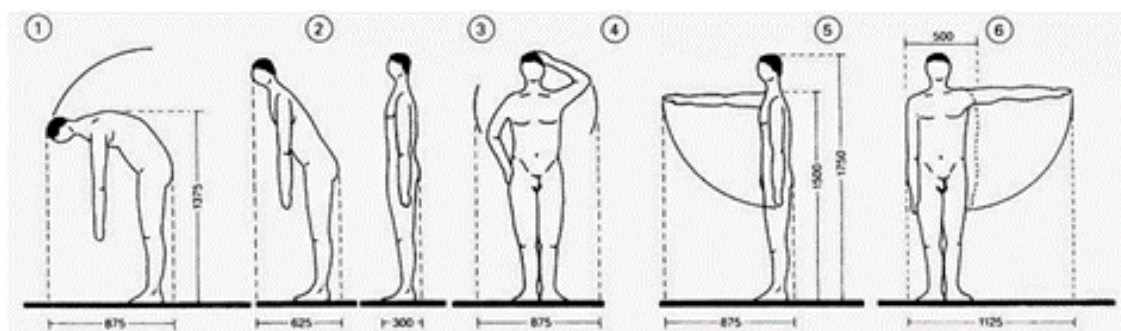


Figure 2. The Motion of Anatomy of the Human Body

Ergonomics is a science that studies about the application that seeks to adjust between work and environment to people or human beings and vice versa with the goal of achieving the highest productivity and efficiency through human utilization as optimal as possible.

Broadly speaking, ergonomics is also a science that discusses the advantages and limitations of human beings and systematically utilize the information for design to produce a better product, system or work environment.

In ergonomics, there is also matching the type of work with its work environment and adjustment to the perpetrators of work that is human. It will be related to the use of technology or the right tools with the type of work to achieve maximum productivity work (Figure 3).

3.3.2 Ergonomic functions. Ergonomics has the function of making it easy for humans to do a job. Thus the constraints of human limitations can be overcome. So that one's productivity can increase because of its ergonomic position can reduce fatigue level at work.

DIMENSI TUBUH	PRIA				WANITA			
	5%	X	95%	S.D	5%	X	95%	S.D
1. Tinggi Tubuh Posisi berdiri Tegak	1.532	1.632	1.732	61	1.464	1.563	1.662	60
2. Tinggi Mata	1.425	1.520	1.615	58	1.350	1.446	1.542	58
3. Tinggi Bahu	1.247	1.338	1.429	55	1.184	1.272	1.361	54
4. Tinggi Siku	932	1.003	1.074	43	886	957	1.028	43
5. Tinggi Genggaman Tangan (Knuckle) pada Posisi Relaks ke bawah	655	718	782	39	646	708	771	38
6. Tinggi Badan pada Posisi Duduk	809	864	919	33	775	834	893	36
7. Tinggi Mata pada Posisi Duduk	694	749	804	33	666	721	776	33
8. Tinggi Bahu pada Posisi Duduk	523	572	621	30	501	550	599	30
9. Tinggi Siku pada Posisi Duduk	181	231	282	31	175	229	283	33
10. Tebal Paha	117	140	163	14	115	140	165	15
11. Jarak dari Pantat ke Lutut	500	545	590	27	488	537	586	30
12. Jarak dari Lipat Lutut (popliteal) ke Pantat	405	450	495	27	488	537	586	30
13. Tinggi Lutut	448	496	544	29	428	472	516	27
14. Tinggi Lipat Lutut (popliteal)	361	403	445	26	337	382	428	28
15. Lebar Bahu (bideltoid)	382	424	466	26	342	385	428	26
16. Lebar Panggul	291	330	371	24	298	345	392	29
17. Tebal Dada	174	212	250	23	178	228	278	30
18. Tebal Perut (abdominal)	174	228	282	33	175	231	287	34
19. Jarak dari Siku ke Ujung Jari	405	439	473	21	374	409	443	34
20. Lebar Kepala	140	150	160	6	135	146	157	7
21. Panjang Tangan	161	176	191	9	153	168	183	9
22. Lebar Tangan	71	79	87	5	64	71	78	4
23. Jarak Bentang dari Ujung Jari Tangan Kanan ke Kiri	1.520	1.663	1.806	87	1.400	1.523	1.646	75
24. Tinggi Pegangan Tangan (grip) pada Posisi Tangan Vertikal ke Atas & Berdiri Tegak	1.795	1.923	2.051	78	1.713	1.841	1.969	79
25. Tinggi Pegangan Tangan (grip) pada Posisi Tangan Vertikal ke Atas & Duduk	1.065	1.169	1.273	63	945	1.030	1.115	52
26. Jarak Genggaman Tangan (grip) ke Punggung pada Posisi Tangan ke Depan (horisontal)	649	708	767	37	610	661	712	31

Figure 3. Ergonomic.

3.3.3 Lighting. A good workspace must meet the good lighting aspect to make the user comfortable, the workspace needs for lighting is very important to use. Lighting should not be too dim or too bright. From this aspect of lighting to be considered in the space. The normal lighting aspects of the workspace are as follows:

- **Direct Lighting System** In this system, 90-100% of light is directed directly to objects that need to be illuminated. This system is considered effective in regulating lighting, but still has weaknesses because it can cause danger and glare, either because of direct irradiation or by reflection of light. For optimal lighting, it is recommended that the ceiling, walls, and objects in the room should be brightly colored to make it more soothing to the user's eyes.
- **Semi-Direct Lighting** In this system, 60-90% of light is directed directly at the object that needs to be illuminated, while the rest is reflected to the ceiling and walls. The weakness of this system of direct lighting can be reduced.
- **Indirect Lighting System** At this illumination, 90-100% of the light is directed to the ceiling and the upper wall is then reflected to illuminate the entire room. It aims to allow the entire ceiling to be a source of light. The advantage of lighting is not to cause shadows and glare while losses reduce the total light efficiency that falls on the work surface.

Many factors and risks in the office environment that affect the safety and health of workers one of them is lighting. Here's the minimal lighting required by the following types of activities (Table 1 and Table 2).

Table 1. Lighting.

TYPE OF ACTIVITY	MINIMAL LIGHTING LEVEL (LUX)	DESCRIPTION
blue-collar workers and not continuous	100	Storage space & equipment/installation space that require continuous work
blue-collar workers and continuous	200	Work with machines and rough assembly
Routine work	300	Administration Room, Control Room, Machine Work & Assembly / Constructor
The rather smooth work	500	Making drawings or working with office machines, inspection work or work with machines
Smooth work	1000	Color selection, textile processing, fine machine work & fine assembly
The very subtle work	1500	Engraving, inspection of machine work and assembly is very smooth
Detailed work	3000	Inspection work, an assembly is very smooth
	No shadow	

Table 2. Lighting Requirements by Area of Activity.

Needs	Lighting (LUX)	Sample Activity Area
General Lighting for the room and areas that are rarely used and/or tasks or simple visual	20	Minimum lighting service in the outdoor circulation area, open area shopping, storage yard
	50	Pedestrian & stage
	70	Boiler room
	100	Trafo page, furnace room, etc.
	150	Circulation areas in industry, shops and storage rooms.

Table 2. Cont.

General lighting for interior	200	Minimum lighting service in the task
	300	Medium table & work machine, a general process in chemical and food industries, reading and archiving activities.
	450	Clothes hangers, checks, office for drawing, machine assembly and delicate parts, color jobs, critical drawing tasks.
	1500	Very fine machining and table work, small precision machining assembly and instruments; electronic components, measurement & inspection of complicated small parts (some may be provided by local lighting duties)
Additional local lighting for the right visual task	3000	Precise and detailed work, eg very small instruments, watchmaking, engraving

3.3.4 Noise. The noise level of a space will affect the comfort level of the userspace. In the work required the atmosphere of space that is not too noisy and minimal sound to create work concentration and increase productivity.

Concentration is needed when working, indirectly the brain will be stimulated to think systematically. It is this systematic thinking habit that automatically also trains and accustoms the brain to concentrate and focus on learning or doing something.

The noise level of a room will greatly affect the level of one's work concentration that will increase or decrease the productivity of people while working

Space must have a system to prevent noise from outside or from within, a good space will make users feel comfortable in it. Space must meet the acoustic criteria to prevent noise in designing a space, as follows:

a) Direct arrivals

Direct arrivals are the effect of placing objects on the space. By minimizing the existing items in the room, it will increase the sound issued from a sound source directly to be heard and reflected. So that the need for objects that can muffle the sound in a workspace

b) Diffusion

Acoustic Diffuse is the spread of sound pressure evenly or can be interpreted as the presence or absence of a buzzing sound to return to the source. A good acoustic diaphrase is indicated by a buzzing sound that returns to the source. This diffusion factor is enough to affect the comfort in the room in the work.

c) Warmth

Warmth is the time of buzzing the room at a lower frequency greater than the mid-high frequency, then the room will be warmer (warmth). Higher buzzing times in low-frequency areas are usually preferred for rooms used for musical activities. For the room used for speech activity, it is preferable for a flat hum for low-mid-high frequencies.

d) Blend and Ensemble

Blend Criteria shows that if all sound sources are sounded in the room mixed well (and can be enjoyed of course), then the listening conditions in the room is said to be good. This is related to the criteria of how the sound in the stage area is mixed (ensemble).

e) From the discussion above a space must have acoustic criteria for users to feel comfortable and not disturbed by noise. A workspace must also meet the acoustic criteria so that readers can concentrate and have a good psychological impact on users.

3.3.5 Air circulation (ventilation). Air circulation is the process of changing the air in the room by entering the air from outside and discharging the air inside. The best way to do this is by creating the right air vents. In relation to the ideal workspace, must have good air circulation so that it will affect the psychological aspects that can increase the concentration when reading.

3.3.6 User circulation. User circulation is a circulation of activities that occur within the space that is done by the user of the room. In the circulation of this space, it should be emphasized on the distance and hierarchy of the space in order to create a comfortable space to use. This is also closely related to the needs of space for workers so that each user will feel his privacy zone because of the hierarchy and distance created by both the object and by the man himself.

3.4. Business and economic aspects

In the business and economic aspects, there are several factors that can increase the attractiveness of users in using co-working space. Design of Co-working space and management side.

Based on case studies located in Bandung City, the aspects that affect and adapt to the user conditions of the co-working space, namely:

3.4.1 Co-working space facility. To increase the user's appeal in the provision of co-working space facilities, it should pay attention to user facility requirements and activities or activities performed by the user. In the context of the city of Bandung in general are freelancers, startups, and students. The need for a flexible and dynamic workplace and balancing between formal and informal means, such as with the provision of facilities:

- Meeting room
- Formal workspace
- Informal workspace
- Co-working area
- Cafe or coffee shop
- Entertainment facilities
- Green open space
- Room rental
- Library
- Internet facilities
- Food and beverage facilities
- Adequate vehicle parking facilities
- Locker facilities

Some of the above facilities will be able to provide user attraction in the use of co-working space.

3.4.2 Operational hour. In the context of the city of Bandung in general are freelancers, startups, and students. Operating hours for users are better open for 24 hours, it will provide users with high flexibility and provide their own attraction and productivity to their users.

3.4.3. User target. In the context of the city of Bandung, target users are advised to focus on the freelancers, startups, and students. It becomes very potential from the business aspect because the level of students in Bandung and startup and freelancer is high enough, thus providing the means of productive co-working space.

3.4.4. Price Range. In the context of the city of Bandung whose users are freelancers, startups, and students, the range of prices determined must adjust to the financial level of students or freelancers. Ranger prices can be determined by the price of any table rental that has been included with facilities to

eat and drink, Wi-Fi facilities and electricity usage facilities. Price benchmarks usually range from Rp.50.000 – Rp.75.000 which is included in the facility as well.

4. Conclusion

From the above aspect, a good co-working space facility should take into account the anthropometry and ergonomics of the objects in the space to make the user feel convenient. Workspaces must also emphasize the lighting and noise aspects of the space. In the workspace, lighting is very important because it will affect the productivity of its users.

The noise level of the room was noticed in such a way that it does not interfere with the concentration of workers. Space greatly influences its use so that when the space in the form of a positive impact, then the user will get a positive result also in using the space. Space will be very closely related to the psychological aspect of the user, the user psychology will have an effect on the interest of the user. Likewise with the workspace in a good co-working space will be closely related to the increased productivity of its users.

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