



## A Study of Spaces & Level of Wayfinding in a Commercial Serviced Apartment: Case Study of Hachi Serviced Apartment

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Human activity;  
Accessibility; Interior design for hospitality.

### Abstract

The spaces inside a commercial apartment need to be arranged to achieve an effective distinctive area that will distinguish visitors from public and private spaces. It needs to accommodate multiple guests and travelers in private rooms while offering public facilities and common spaces. This paper aims to examine the configuration of public and private spaces and the permeability level in HACHI Serviced Apartment, Thailand. The degree of permeability and wayfinding is indicated by using the justified graph method with numbering systems. The result shows that the building's overall spaces are private in terms of configurations, and the level of wayfinding is also easy, which helps to provide simple navigation to the building users. The circulation and the spaces organizations of HACHI Serviced Apartment give a satisfactory degree of accessibility to the users, contributing to a deeper perception of public space and configurations of private space.

**Discipline:** Architectural Engineering.

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## 1 Introduction

A commercial serviced apartment emerged as a combination between a conventional hotel and a residential apartment (Greenberg & Rogerson, 2018). They provide more convenient lifestyle travel spaces while offering hotel-like services and amenities. According to Geieregger &

Oehmichen (2008), both hotels and commercial serviced apartments seek to rent their units. Yet, the latter provide bigger living spaces and incorporate a home away from home concept. Hanton (2016) emphasized that the serviced apartment sector is the fastest-growing component of the hospitality industry, offering today's travelers the best of a design-led hotel experience with independent living at home. This paper presents a study on the arrangement of public and private spaces and the level of wayfinding in a commercial serviced apartment. Accordingly, each individual's wayfinding level may vary and rely on the building's own spaces (Rahaman et al., 2019).

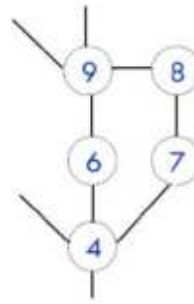
Designed by Octane Architect & Design, this paper's case study is a HACHI Serviced Apartment, completed in 2018 and located in the Ladprao business area, Bangkok. The project received Popular Winner and 2019 A+Awards Typology Apartment awards for its distinctive exterior façade features and spatial layout. The spaces within are designed to accommodate travelers and guests by dividing the activity areas into a series, of ordered spaces. Munir et al. (2019) stated that the spaces people occupy are different subject to their users' basis and capacity. The case study's issue is to identify how the spaces inside a commercial apartment need to be arranged to achieve an efficient distinctive area that will separate public and private spaces for guests. A typical commercial accommodation and hotel will need to accommodate several guests and travelers in private rooms while providing public amenities and communal areas.

This research examines the configuration of the building typology's public and private spaces in the case study. It aims to explain special spatial arrangements in the layout organization. Space syntax theory is applied to help research the extent of permeability and wayfinding. Wayfinding is regarded as the most common means of obtaining knowledge of the place (Golledge, 1992). The objectives of this paper are as follows:

1. To determine the wayfinding level of the user group through spatial structures.
2. To analyze the arrangement of public and private spaces in a commercial-residential building.

## 2 Literature Review

Space syntax is defined as a set of descriptive and quantitative instruments to study spatial formations in various ways (Hillier & Hanson, 1984; Mohamed, 2019). The relationship between human beings and their occupied spaces is the key concern of space syntax. It can predict the socio-spatial information that can be applied to a specific spatial configuration (Yusoff et al., 2019). Based on Dursun (2007), space syntax referred to a relational function of space as configuration and suggested that this feature shapes human behavior, as it contains social information. In other words, it is a theory that deals with the layout. A drawing of a plan is considered linked spaces, where these links are evaluated, and each space is allocated numerical measures on that basis. (Haq & Luo, 2012). According to Mustafa et al. (2010), different spatial arrangement diagrams can show different social purposes.



Linear diagram to show movement patterns

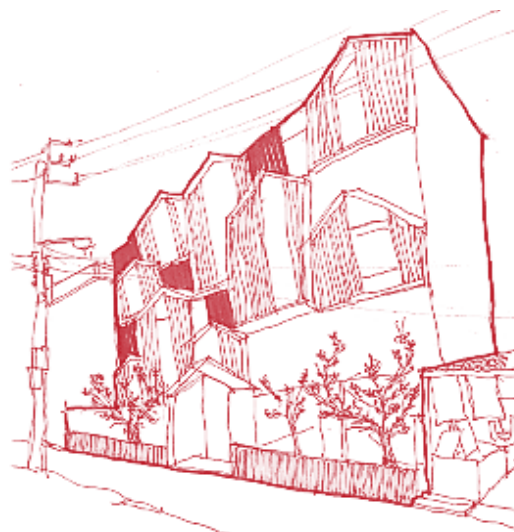
Connected diagram to show shared private spaces

**Figure 1:** Linear diagram & Connected diagram (after Mustafa et al. (2010)).

Munir et al. (2019) define wayfinding as several combined variables that form an atmosphere for people to navigate. It is assessed by the experience of users and the ease of getting from one space to another. Wayfinding is described as a complex process and has often been referred to as an environmental response, depending on whether the visit is pre-planned or unplanned (Hashim and Said, 2013). However, Garling et al. (1983) stated that familiarity with a building also has a huge effect on wayfinding quality. Based on Holscher et al. (2005) research, there are distinct behavioral variations between participants who already had significant previous experience with the building. Furthermore, important foundations for the effective performance of human wayfinding are based on the environment's visual-spatial characteristics (Rahaman et al., 2019).

### 3 HACHI Serviced Apartment

According to Henderson & Smith (2012), serviced apartments are identified as a distinctive form of tourism accommodation and are growing in diversity, popularity, and commercial significance. Since they offer larger living spaces, self-catering facilities, and hotel-like amenities, this accommodation type is increasing in demand among business travelers (Downey, 1991).



**Figure 2:** Exterior view of HACHI Serviced Apartment, in Bangkok, Thailand.

Bangkok has been one of the world's busiest commercial capitals. Consequently, the serviced apartments industry there has been increasingly competitive and in higher demand (Phadungyat, 2008). Younes & Kett (2007) point out that the serviced apartment sector is highly attractive from

a commercial point of view. The risks associated with initial, operating, and maintenance costs are average compared to standard hotels.

A case study is conducted on HACHI Serviced Apartment, Bangkok. This commercial service apartment with a monthly rental concept was to cater to semi-private functions. It is surrounded by crowded urban housing, office buildings, and traditional apartments and is located in the Ladprao business area. It is designed as a semi-public building and consists of 34 units of rental rooms ranging from 26 to 44 square meters, a multi-purpose room, and an office area. The overall area of the building is approximately 1,100 square meters and a five-story height. The building consists of several modular gable stories, each of which, including different width, lath orientation, and height, is orderly differentiated. By centering on an analogical concept of ancient Eastern people, the emotional design created the entire interior, organizing spaces by dividing each activity area in a series where each region is divided by gable arches that connect to the outside.

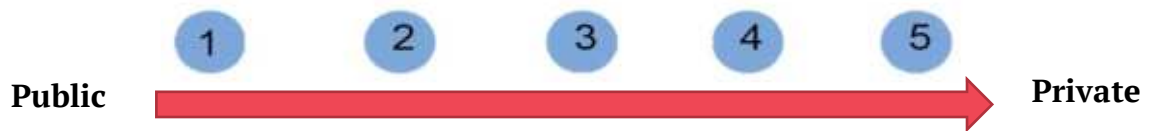
## 4 Method

This paper uses qualitative analysis through a justified graph to measure the efficiency of spatial networking in terms of permeability and the arrangement of spaces. First, a literature review on the academic discourse of spatial syntax and building typology is carried out to provide a framework on which case studies can be properly examined.

A thorough analysis of a case study is carried out and a measurable scale graph is used for the analysis. An efficient research method must be developed to analyze spatial networking. This research uses a movement graph level, as shown in the example in Figure 5, to show both the permeability level and the wayfinding of the spaces present in each case study. Morphology deals with access between rooms, the interaction between spaces, and the diagrams of these relationships (Hillier and Hanson, 1984).

The justified graph represents the permeability level for the internal building layout. Each number in the circle corresponds to the space labeled on the building's floor plans with the same number. Several spaces with equal depth are shown by the horizontal axis, while the various lines suggest a connection between the linked spaces.

Brandon (2010) has stated that the best way to accomplish this wayfinding task is to introduce spatial hierarchies into the numbering graph by leveling them. Thus, the floor plans' spaces are numbered and associated with various colors, and labeled with alphabets. The navigability can help assess the degree of permeability and level of wayfinding according to the user, divided into employees and tourists. The level of permeability and wayfinding in the HACHI Serviced Apartment can be measured with the floor plan's help by stages. The Likert scale is the most commonly used method to scale survey research responses to support wayfinding and permeability. Figure 3 shows the leveling of the graph based on the Likert Scale where the five-category scale is used; (1) public; (2) semi-public; (3) semi-private; (4) private; and (5) extremely private. The analysis and interpretation of Likert scale data will make wayfinding and permeability more efficient.



**Figure 3:** Example of Justified Graph (based on Abdulla, 2010)

This case study will distinguish the type of building user based on color indicators. Each depth level will be represented by different colors, red to show the connectivity for guests, and blue color will indicate the permeable spaces for staff. These indicators will assist in determining the permeability degree in the case study. As for the staircase, they will be labeled with S1 and S2. Transitional spaces like corridors are stated as (C) to understand how individuals usually move to different spaces.

The increased leveling of the graph assesses the evaluation of wayfinding and permeability to find the results. The more spaces at the highest level are indicated, the greater the room's permeability and wayfinding propensity. There is a highly permeable network in the regions as the connectivity grows. The result is obtained by defining the size of the numbering graph's degree of permeability and wayfinding.

## 5 Result

The analysis will be carried out for each floor individually. The building users are categorized into staff and guests. The circulation will be converted into a measurable graph format from which the permeability level can be understood.

### 5.1 Site and Ground Floor Plan

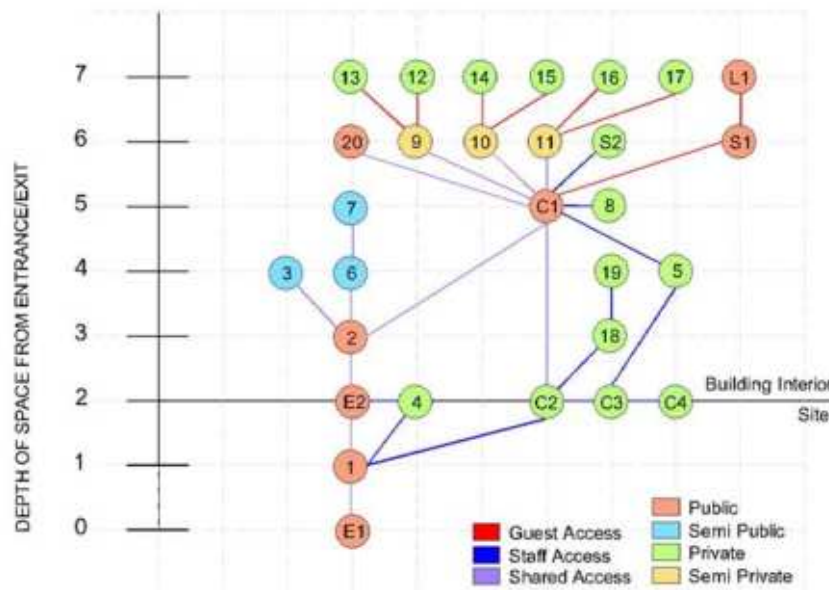
The rooms are labeled by numbers, while connecting spaces like corridors, lifts, and staircases are labeled by C1-C5, L1, and S1-S2, respectively. Table 1 shows the schedule of accommodation for the HACHI Serviced Apartment with numbers corresponding to labels in Figure 4.



**Figure 4:** Site Plan and Ground Floor Plan of HACHI Serviced Apartment.

**Table 1: Schedule of Accommodation for Ground Floor Plan**

No	Spaces	No	Spaces
C1	Corridor 1	5	Laundry Room
C2	Corridor 2	6	Co-working Office
C3	Corridor 3	7	Office Pantry
C4	Corridor 4	8	Housekeeping Room
L1	Lift 1	9 - 11	Bedroom (Type B)
S1	Staircase 1	12, 14 & 16	Bathroom (Type B)
S2	Staircase 2	13, 15 & 17	Walk-in Wardrobe (Type B)
1	Car Park	18	Staff Room
2	Reception	19	Staff Bathroom
3	Multi-Purpose Room	20	Public Bathroom
4	Storage		



**Figure 5: Level of Permeability (Ground Floor)**

Based on Figure 5, there are four depth levels of permeability in the justified graph, namely public, semi-public, private, and semi-private. Both guests and staff have a very straightforward flow from the main entrance into their respective functional spaces. The visitors and staff shared the same parking space (1) on the ground floor due to the site's limited space. Their access to the site is limited to only one entrance (E1) at the main gate and the main building entrance (E2). Visitors are then linked to the reception space (2) for the check-in process and waiting area. Meanwhile, staff will have access to the storage (4) from the main entrance (E2). The service corridors, namely (C2 – C4), are fluidly linked to each other and fully accessible for the main entrance staff. Service corridor 2 (C2) will lead to the staff room (18), which the latter is connected to the staff bathroom inside (19).

The communal spaces, which are the multi-purpose room (3) and co-working office (6), are semi-public spaces and accessible from reception (2). Meanwhile, the office pantry (7) can be reached via a co-working office (6). Users are then linked through transition space, which is the corridor (C1), to gain access to the public bathroom (20), laundry (5), housekeeping room (8), and hotel units (9, 10, 11). The hotel units are labeled as semi-private spaces as staff also have access to

these rooms for cleaning and housekeeping purposes. Each of the bedrooms in hotel units is linked to the unit's bathroom (12, 14 & 16) and walk-in wardrobe (13, 15 & 17). The main staircase (S1) and lift (L1) to the upper levels are linked via corridor 1 (C1) for guest's usage, while staff has a separate staircase (S2) for them, which also acts as a fire escape staircase.

## 5.2 First-Fourth Floor Plan

Figure 6 shows the typical floor plan, which ranges from the first to fourth-floor plan of the building. Table 2 shows the accommodation schedule for the HACHI Serviced Apartment with numbers corresponding to labels in Figure 6.

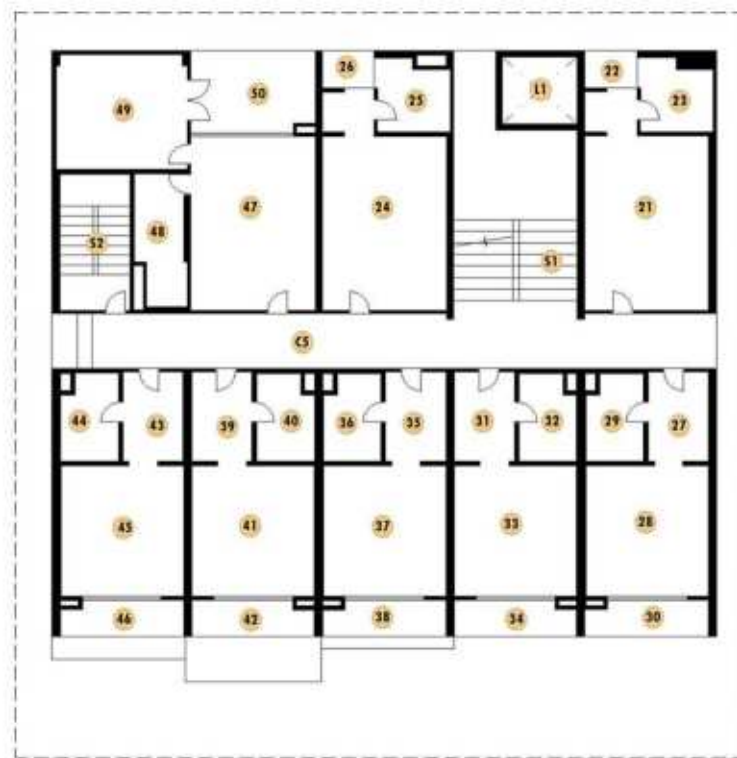


Figure 6: First-Fourth Floor Plan of HACHI Serviced Apartment

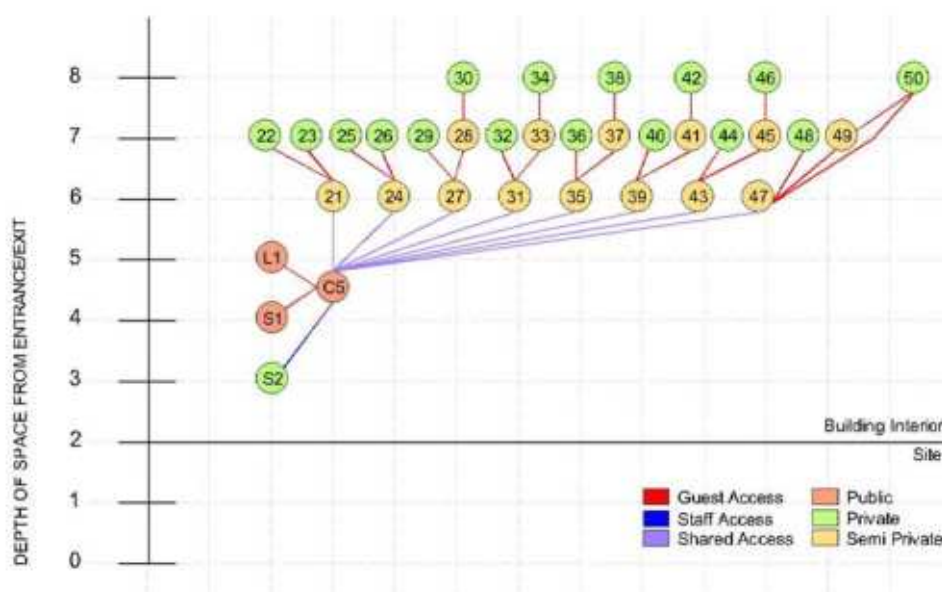


Figure 7: Level of Permeability (First - Fourth Floor)

**Table 2: Schedule of Accommodation for First-Fourth Floor Plan**

No	Spaces	No	Spaces
C5	Corridor 5	28, 33, 37, 41 & 45	Bedroom (Type B)
L1	Lift 1	29, 32, 36, 40 & 44	Bathroom (Type B)
S1	Staircase 1	30, 34, 38, 42 & 46	Balcony (Type B)
S2	Staircase 2	47	Living & Dining (Type C)
21 & 24	Bedroom (Type A)	48	Bathroom (Type C)
23 & 25	Bathroom (Type A)	49	Bedroom (Type C)
22 & 26	Walk-in Wardrobe (Type A)	50	Garden Patio (Type C)
27, 31, 35, 39 & 43	Foyer (Type B)		

Figure 7 shows three depth levels of permeability in the justified graph, namely public, private, and semi-private. The flow is very straightforward as the guests will be directly connected to their rental rooms, whether Type A rental rooms, Type B rental rooms, or Type C rental rooms from the main public staircase (S1) and lift lobby (L1), which are continuously linked from the ground floor. The rooms are labeled as semi-private as they are accessible to staff as well for housekeeping. Guests will have easy and direct navigation linked by the transitional space, corridor 5 (C5), without having to pass through too many spaces. This is an example of a strong spatial organization tailored for the convenience of guests. For Type A studio rooms, guests will be greeted by bedrooms (21 & 24) before reaching the bathrooms (23 & 25) and walk-in wardrobes (22 & 24). For Type Brooms, guests will encounter the foyer (27, 31, 35, 39 & 43) before reaching the bedrooms (28, 33, 37, 41 & 45) and the bathrooms (29, 32, 36, 40 & 44). The private balconies in each room (30, 34, 38, 42 & 46) are accessible via the bedroom. In the meantime, Type C has a living & dining area (47) right after the entrance from corridor 5 (C5). The space is then linked to the bathroom (48), bedroom (49), and garden patio (50). Guests can also access the garden patio (50) via their bedroom (49).

Meanwhile, the staff is directly connected to each floor via private staircase 2 (S2) for cleaning and housekeeping purposes. This indicates clear segregation between public and private spaces and between guests' general linkage and staff's services linkage. The configuration of spaces at this level allows occupants to easily browse the areas without getting lost easily.

### 5.3 Top Floor Plan

Figure 8 shows the building top floor plan. Table 3 shows the schedule of accommodation for the HACHI serviced apartment with numbers corresponding to labels in Figure 8.

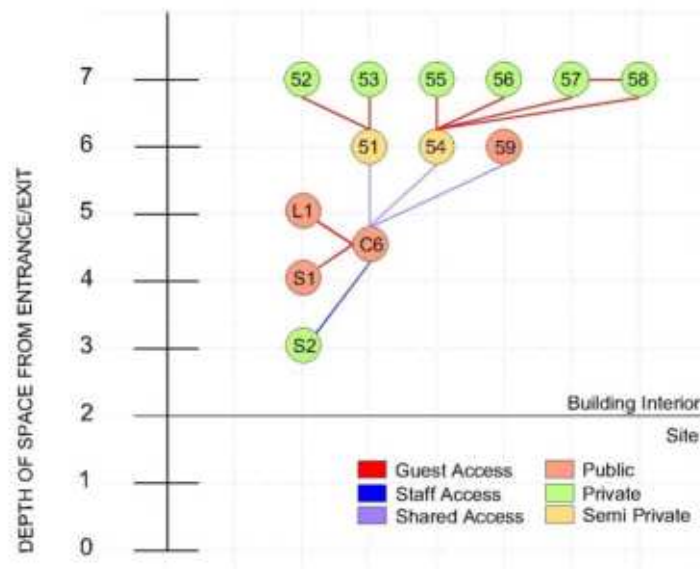
**Table 3: Schedule of Accommodation for Top Floor Plan**

No	Spaces	No	Spaces
C6	Corridor 6	54	Living & Dining (Penthouse)
L1	Lift 1	55	Bathroom (Penthouse)
S1	Staircase 1	56	Kitchen (Penthouse)
S2	Staircase 2	57	Bedroom (Penthouse)
51	Bedroom (Type A)	58	Garden Patio (Penthouse)
52	Bathroom (Type A)	59	Rooftop Garden
53	Walk-in Wardrobe (Type A)		





**Figure 8:** Top Floor Plan of HACHI Serviced Apartment



**Figure 9:** Level of Permeability (Top Floor)

Figure 9 shows three depth levels of permeability in the justified graph, namely public, private, and semi-private. The spaces on the top floor are limited to only semi-private rental units and a rooftop garden. The guests who are staying on the top floor are linked to the transitional space, corridor 6 (C6), from the same main staircase (S1), and lift (L1) to gain access to their rooms, which are Type A rental rooms and Penthouse. The staff's service staircase (S2) will also have direct access to corridor 6 (C6). This makes accessibility and wayfinding incredibly easy to assess.

For Type A room, possessed the same configuration as the lower floor units where the bedroom (51) will be linked to the bathroom (52) and the walk-in wardrobe (53) after the entrance. As for the Penthouse type, the living and dining area (54) is connected to the kitchen (56), bathroom (55), bedroom (57) as well as the garden patio (58). Guests can also access the garden patio (58) via their bedroom (57). On the other hand, the rooftop garden (59) is open to public access and reachable through corridor 6 (C6) for outdoor activities. Overall, the flow and the wayfinding level on this floor are very easy and straightforward for both the public and guests.

## 6 Discussion

The analysis shows that the accessibility and visibility characteristics of the space layout form the patterns of wayfinding behavior. By analyzing its accessibility level for users, the wayfinding pattern of the HACHI Serviced Apartment was assessed. The overall shape of the justified graph is determined as asymmetrical and tree-like structures.

**Table 4: Percentage of Permeability Level in HACHI Serviced Apartment**

Level	Types	Total	Percentage
Primary	Public	8/29	28%
	Semi-Public	3/29	10%
	Private	15/29	52%
	Semi-Private	3/29	10%
Secondary	Public	3/34	9%
	Semi-Private	14/34	41%
	Private	17/34	50%
Tertiary	Public	4/13	31%
	Semi-Private	2/13	15%
	Private	7/13	54%

As the depth of space increases, the permeability and wayfinding level also increase. Table 4 shows that the lowest percentage for permeability level at the primary level is tally at 10% for semi-private and semi-public spaces. In comparison, the highest rate is 52% for private spaces. The secondary level shows the lowest percentage at 9% for public spaces and the highest percentage is 50% for private spaces. Besides that, the lowest percentage at the tertiary level of permeability is for public spaces at 13%, and the highest percentage is 54% for private spaces. This concludes that the highest and many spaces in the building accommodate the private spaces as a commercial apartment needs to cater to individual rooms for each guest with utmost privacy and seclusion.

**Table 5: Percentage of Wayfinding Level in HACHI Serviced Apartment**

User	Types	Total	Percentage
Guest	Easy/Straightforward	34/43	79%
	Intermediate	9/43	21%
Staff	Easy/Straightforward	8/12	67%
	Intermediate	4/12	33%
Shared	Easy/Straightforward	18/23	78%
	Intermediate	5/23	22%

Table 5, there are only two types of wayfinding levels for each user type: easy/straightforward level and intermediate level. The lowest percentage of wayfinding level for guests is 21% for the intermediate level, and the highest percentage is 79% for the easy/straightforward level. As for staff circulation, the lowest percentage is 33% for the intermediate level and 67% for the easy/straightforward level. The same hierarchical order can be seen for shared circulation access as the lowest percentage is 22% for the intermediate level and 78% for the easy/straightforward level. This result shows that the building has a very easy and straightforward level of wayfinding as each route is easy to navigate and accessible to the building users.

**Table 6:** Number/Percentage of Assorted Spaces in HACHI Serviced Apartment

Types	Total	Percentage
End Room	2/14	14%
Single Connecting Space	2/14	14%
Triple Connecting Space	1/14	7%
Staircase	2/14	14%
Lift/Elevators	1/14	7%
Lobby	1/14	7%
Foyer	5/14	36%

Based on Table 6, the end room percentage is 14%, while single connecting spaces consisting of corridor 5 (C5) and corridor 6 (C6) are also 14%. Besides that, the triple connecting spaces involving corridor 2 (C2), corridor 3 (C3), and corridor 4 (C4) are 7%. In terms of staircases, there are two staircases in the building, which brings a percentage of 14%, while the building only has one lift, which brings 7% of the total number of assorted spaces. There is only one main lobby on the ground floor for foyers and lobby, which brings a percentage of 7%, and only Type B units have their separate foyers, which consist of 6 foyers and brings the percentage up to 36% of the total number of assorted spaces.

## 7 Conclusion

Based on the findings and analysis, the user group's wayfinding level through spatial structures has been determined as very straightforward to the building users. In contrast, the arrangement of public and private spaces in a commercial-residential building has been analyzed as private spaces. Each space is arranged according to the programmatic functions. In general, the spatial arrangements are clear and suitable for the temporary nature of the buildings' solutions. The rooms are arranged so that the guests can easily find their way inside and maneuver through the area with ease while still serving each space's privacy. The case study serves as an example of a commercial-residential building that possesses a good spatial organization of the building spaces as the level of wayfinding is very straightforward. It will ease the guests coming to stay. The visits to the case study location would help a better understanding.

## 8 Availability of Data And Material

All information is included in this article.

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