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SPACE SYNTAX STUDY FOR VAKKO HEADQUARTERS AND POWER MEDIA CENTER IN ISTANBUL

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ABSTRACT

This paper discusses the science-based and human-focused approach of space syntax analysis with its levels of permeability and wayfinding to explain how the spatial layout of specific building typology influences the ways people use them. This research objective is to relate spatial configuration to its building typology, which in this case is a broadcast media centre, using space syntax analysis by the case study. Broadcast centres are stations that include radio, television and other electronic media outlets whose primary objective is to transmit information and entertainment news to the public. Space syntax is defined as a technique of describing and analyzing the relationship between spaces of urban areas and buildings (Jacoby, 2006). This research approaches by studying the layout plans of building with labelling spaces in alphanumeric and tabulated in a measurable scale graph figure that shows its level of permeability and wayfinding. In conclusion, the degree of permeability and wayfinding for broadcast media centres are more involved in wayfinding and less permeable for public users and staffs due to security purposes. Hence, designing the best layout for this building typology is vital as a guideline.

Disciplinary: Architectural Science.

1. INTRODUCTION

Space is one of the elements in the design of architecture (Ching, 2007) as spaces begin to be captured, enclosed, moulded and organized by solid elements of mass. Space is the void or the absence of mass that is experienced when a person enters a building and can be defined by visual of the floor, structures, walls and ceiling. The word syntax refers to the arrangement of words or phrases that creates a well-formed sentence that gives meaning in a language. The same goes to architecture; spaces should be arranged as such, it makes sense to people who use the building (Jacoby, 2006).

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Designing floor plans and circulation for efficient orientation and navigation is one of the most omnipresent and complex problems in architectural design. A building's distribution is the key to organizing layout and communication within spaces as it connects the exterior and interior areas and reflects the overall spatial arrangement of the structure. However, its efficiency depends on making the destination evident to the user, so that user can easily direct their movement towards their intended space (Natapov et al., 2015).

Spatial layout of buildings influences the ways people use them and through space syntax analysis. Space syntax is said to be a theory of space and a set of analytical, quantitative and descriptive methods for analyzing the spatial formations in different forms such as; buildings, cities, interior spaces, landscapes, and others (Hillier et al., 1984; Hillier, 1996).

Space Syntax is introduced as an attempt to produce a kind of knowledge that will help architects and designers to test, find solutions, and oversee implications and consequences with their design. (Dursun, 2007). Similarly, the roles of space syntax (Li et al., 2009).

(1) It serves as a language for thinking and talking about space in the dialogue between architect and designed spaces.
(2) It merges science-based knowledge into the design process, which establishes the core of "evidence-based design" (Turner et al., 2001).
(3) It provides as tools for architects to explore ideas, understand the effect of their design and let them evaluate their design before-hand.
(4) It gives a chance to architects to assess the designs as to how inhabitants will experience living in it.

This research objective is to compare layout plans of an existing building regarding users as to relate spatial configuration to its building typology of a broadcast media centre. Besides, this study is to understand the function of spaces of this building typology through space syntax analysis. Each area was labelled in numeric or alphanumeric while the information on the level of wayfinding and permeability is shown in a measurable scale graph figure to achieve the objective. Based on the graph figure, the analysis of each layout plans on the level of permeability and wayfinding is tabulated and discussed to compare similarities and differences through the user's perspective.

Due to limitations and restricted resources on the information about news and broadcast media centre buildings especially from locals, an abroad case study has been chosen that is the Vakko Headquarters and Power Media Centre in Istanbul, Turkey. However, the broadcast media centre in this case study is only located in the basement area and more for entertainment rather than news. Above the ground, floor plans shall be disregarded as it mostly consists of Vakko's fashion house offices, which is not in the same typology as discussed in this research.

2. LITERATURE REVIEW

2.1 DEFINITION OF BUILDING TYPOLOGY: NEWS AND BROADCAST MEDIA CENTRE

The building typology to be discussed is the news and broadcast media centre. News can be defined as a newly received or noteworthy information on recent events (Oxford Dictionary, 2018b). Meanwhile, the news means material reported in newspapers or news periodical or on a newscast (Merriam-Webster. 2018). The word broadcast; *noun* by definition, is a television or radio transmission (Oxford Dictionary, 2018a). Hence, broadcast centres are stations that include radio,

television and other electronic media outlets whose primary objective is to transmit information and entertainment news to the public.

2.2 DEFINITION OF SPACE SYNTAX: LEVEL OF PERMEABILITY AND WAYFINDING

Space syntax was pioneered by Bill Hillier and Julienne Hanson from University College London (UCL) during the 1970s. Both came to write about it in a book called "The Social Logic of Space" in 1981. (Space Syntax Network, 2018). Hillier defined space syntax as a technique of describing and analyzing the relationship between spaces of urban areas and buildings.

Space syntax measures the quality of integration and connectivity of spaces within a building and represents it in a formalized graph-based accounts of spatial layout configuration into the architectural analysis (Li et al., 2009).

The fundamental concept of space syntax analysis relies on the study of depth:

1) Level of permeability
2) Level of wayfinding

Permeability can be defined as to permit or restrict people or vehicles movement in a different direction or within the spaces inside a building. Examples for the level of permeability include public, semi-public, and private spaces. Wayfinding is a design system that guides people through the physical environment and enriches their experience and understanding of the space. Hence, through the space syntax analysis that building circulation and ease of wayfinding can be proven.

3. RESEARCH METHOD

This research paper documents the level of permeability and wayfinding through space syntax analysis by comparing layout plans of an existing building as a case study. Hence, a qualitative analysis method was conducted to gain relevant data and information based on the level of permeability and wayfinding by using the Likert scale and measurable graph figures.

Firstly, identify the building typology of case study through a reliable source. However, due to limitation and restricted resources on the information about news and broadcast media centre buildings especially from locals, an abroad case study has been chosen that is the Vakko Headquarters and Power Media Centre in Istanbul, Turkey. Previous literature reviews of related topics gained from websites and printed sources such as books, journals and articles are studied to obtain more information and understanding of space syntax analysis and also the building typology.

After obtaining the necessary information on the case study, the layout plans are redrawn from the original copies with the aid of AutoCAD software and edit using Adobe Photoshop. The spaces within the layout plans are defined in numeric and alphanumeric labels such as **S1, R1, 1, 2, 3 Lc**, **etc**. Axial space conception will be used to read the layouts. Axial space is the longest line that chains convex polygons, a straight line linked to the notion of visibility and can be followed by foot (Jacoby, 2006). Based on the axial space, these labels are then transferred into measurable scale graph figures according to each floor levels, as shown in the example below:

All the labelled spaces which are one syntactic step away from the root (entrance/exit) are placed on the first level in the graph, all the spaces two spaces away will be placed on the second level and so on (Jacoby, 2006). The depth is used as a measurable scale on the graph left axis based on the Likert

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Scale (Table 1) to show the level of permeability and wayfinding of users in the building.

Table 1: the Likert Scale for Space Syntax Analysis of measurable scale graph figures.

Likert Scale Numbering	Level of Permeability	Level of Wayfinding
(-) 1 - 3	Public	Easy
(-) 4 - 6	Semi-Public/Private	Medium
(-) 7 - 9	Private	Hard

The negatives on the numbering of the Likert Scale only indicates the direction of the floor plans going underground. Meanwhile, the colours **green**, **yellow** and **red** represents the level of permeability from **public > semi-public/private > private** on the measurable scale graph figure.

The analysis is to compare two primary users of the building, finding similarities and differences between visitors and staffs. These findings are then recorded as positive, negative or essential in providing a guideline in designing the best layout for this building typology.

3.1 CASE STUDY: VAKKO HEADQUARTERS AND POWER MEDIA CENTER, ISTANBUL, TURKEY (2010)

Designed by REX architects (2010), Vakko Headquarters and Power Media Center is the headquarters for a Turkish fashion house that includes its office, showrooms, conference rooms, auditorium, museum and dining hall, as well as television studios, radio production facilities and screening rooms for Power Media Center, within a 9100m^2 area, see Figures 1 and 2 (Archdaily).

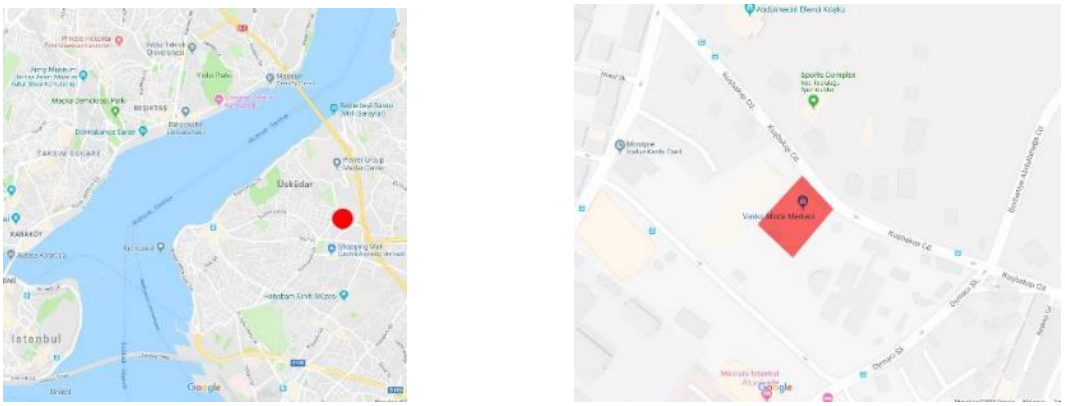

Figure 1: Site Plan and Location Plan of Vakko Headquarters and Power Media Center in Istanbul. Source: https://www.google.com/maps

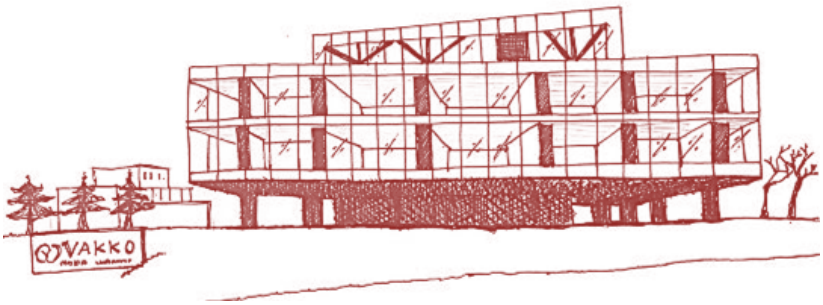

Figure 2: Front elevation of Vakko Headquarters and Power Media Center in Istanbul.

As stated before, the above-ground where the Vakko's headquarters situated will be disregarded as it does not fit the building typology in this research. Hence, we will only be studying users' level of permeability and wayfinding from ground level to basement area where the Power Media Centre is

located (Figure 3). Furthermore, the floor plans shown in Figures 4 and 5 shows the basement level and finally the site plan illustrated in Figure 6. While Table 2 shows the schedule of accommodation for ground floor level corresponding to its colours.

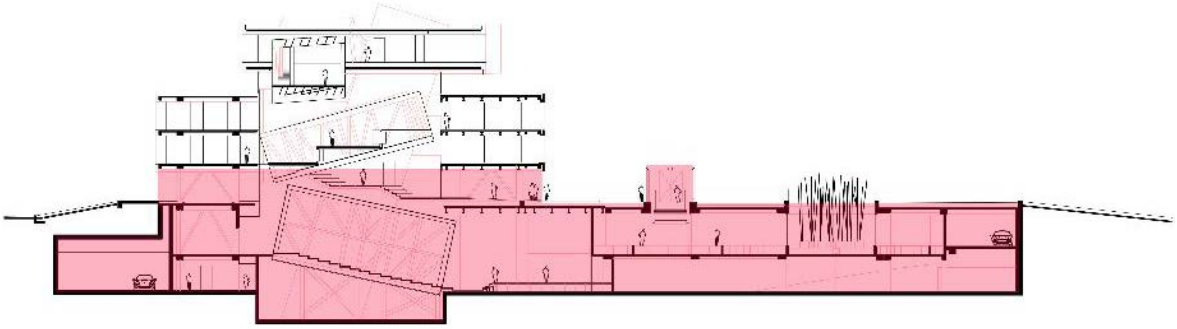

Figure 3: Section of Vakko Headquarters and Power Media Center in Istanbul.

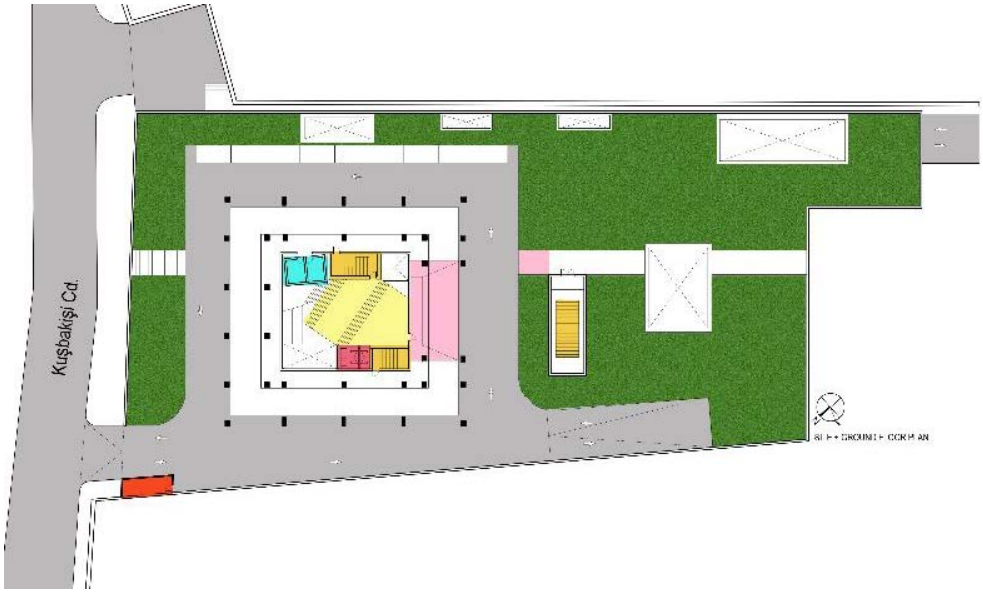

Figure 4: Site Plan and Ground Floor Plan.

Table 2: Schedule of Accommodation for Ground Floor Plan.

Broadcast Media Centre Schedule by area category	Capacity (No. of People)	Number of rooms required	Description of use
Ground Floor Plan			
Guard House/Security Checkpoint		1	To house security
Drop Off			Drop off visitor/staff
Reception Area	20	1	Information &registration desk for visitors
Lobby	15		Waiting/meeting area
Toilet/ Washroom	6	2	Use as washroom
Staircase		3	
Lift/Elevator	10	2	

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Figure 5: Basement Level 1 Floor Plan redrawn from the original copy.

Table 3: Schedule of Accommodation for Basement Level 1 Floor Plan.

Broadcast Media Centre Schedule by area category	Capacity (No. of People)	Number of rooms required	Description of use
Basement Level 1 Plan			
Reception Area	15	1	Information &registration desk for visitors
Lobby	15	1	Waiting/meeting area
Administrative Office	40	10	Office of administrative
TV Production Office	12	7	Office for producers
System Room	2	1	
Radio Production Studio	20	4	Office & Radio stations
Video Lounge	40	1	
Meeting Room	10	1	Use for meetings/ conferences
Recording Room	3	1	
Power IT Room	2	1	IT department office
TV Studio		1	Stage
Auditorium	180	1	Audience seating area
Control Room	5	1	Control the cameras & broadcast
Library / Reading Room	25	1	Reading area & resources center
Library Office	2	1	Office for librarians
Power's Cafe'	55	1	
Vakko's Café'	125	1	
Serving Area	10	1	
Storage			
Cleaning Services	2	1	Dish washing & cleaning
Toilet / Washroom	20	4	
Power Technical Services			
OG Cells			
Security Surveillance Room	2		Security & CCTV rooms
Mail Screening Room			Mailing room
AHU Room		1	
Vakko's Museum			
Art Storage			
Staircase		5	
Lift/ Elevator	10	2	

Table 3 shows the schedule of accommodation for basement level 1, corresponding to its colours. Table 4 shows the schedule of accommodation for basement level 2, corresponding to its colours.

Figure 6: Ground Floor Plan.

Table 4: Schedule of Accommodation for Basement Level 2 Floor Plan.

Broadcast Media Centre Schedule by area category	Capacity (No. of People)	Number of rooms required	Description of use
Basement Level 2 Plan			
Security Checkpoint	2	1	To house security/ get access pass
TV Studio		1	
Private Dressing Room	3	2	Changing room
Makeup room	5	1	
Prop/ Customer Storage			To store props and costumes
Showrooms		3	Exhibition shows
Restroom	1	2	
Flexible Corridor			Backstage/prop setup
Vakko IT Room	2		It department office
TV Server Room	2		To place server
Health Room			
Storage	2		
Technical Service Room	2		
Electric Room	2		Power supply
Locker's Room (Men's & Women's)	10	2	
Mechanical/Electrical Rooms			
Mechanical/Life Safe			Power supply
Staircase		5	
Lift/Elevator	10	2	

4. RESULTS OF ANALYSIS

4.1 CASE STUDY: VAKKO HEADQUARTERS AND POWER MEDIA CENTER

Before proceeding to the analysis, this research will involve two primary users of the building, the staffs and visitors. The staffs are the regular users of this type of building typology as they are mostly workers in departments such as administrative, production TV or radio, cleaners, security, and others. Their access to the building's spaces depends on the job scope and positions apart from their work shifts. Visitors, on the contrary, are the most likely audience for a pre-recorded show or even guest on the talk show. They are usually permitted with ticketing or passes to enter the area such as the auditorium, live stage, or studio within a specific time.

The analysis of site plan and ground floor plans are indicated with the numeric or alphanumeric labels with respective colours, as shown in Figure 7.

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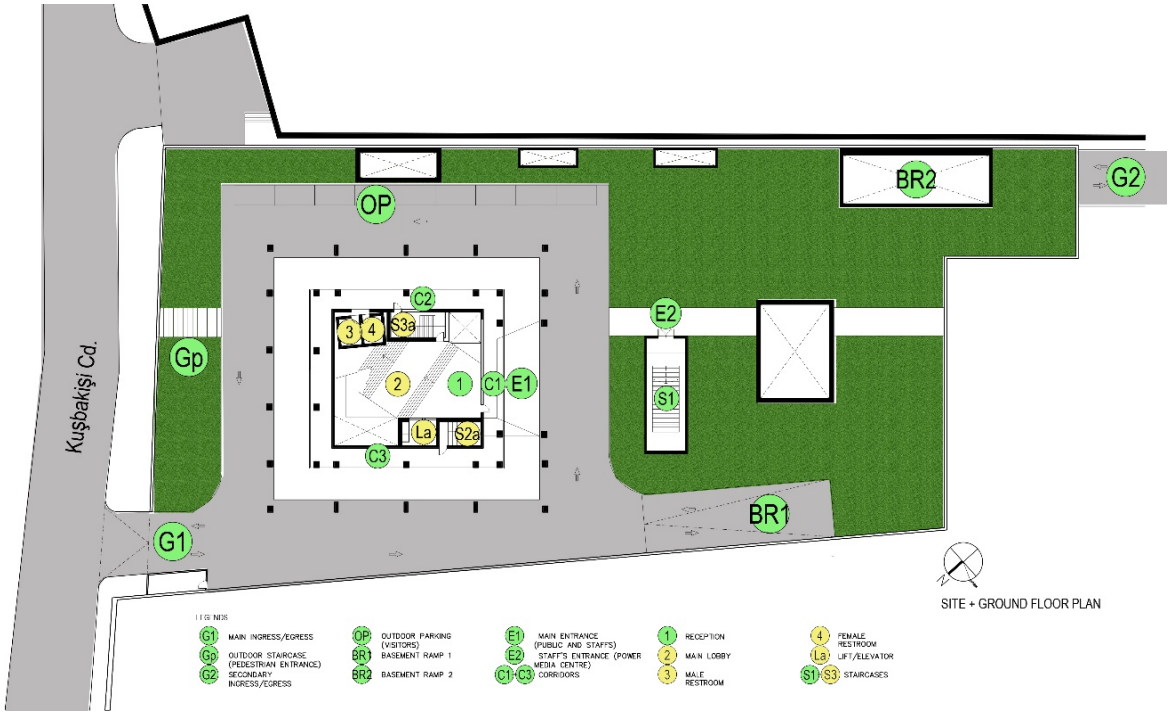

Figure 7: Site Plan and Ground Floor Plan is redrawn from the original copy.
Source: https://www.archdaily.com/56149/vakko-headquarters-and-power-media-center-rex-2.

By referring to the floor plan in Figure 7, this is the analysis for the site plan.

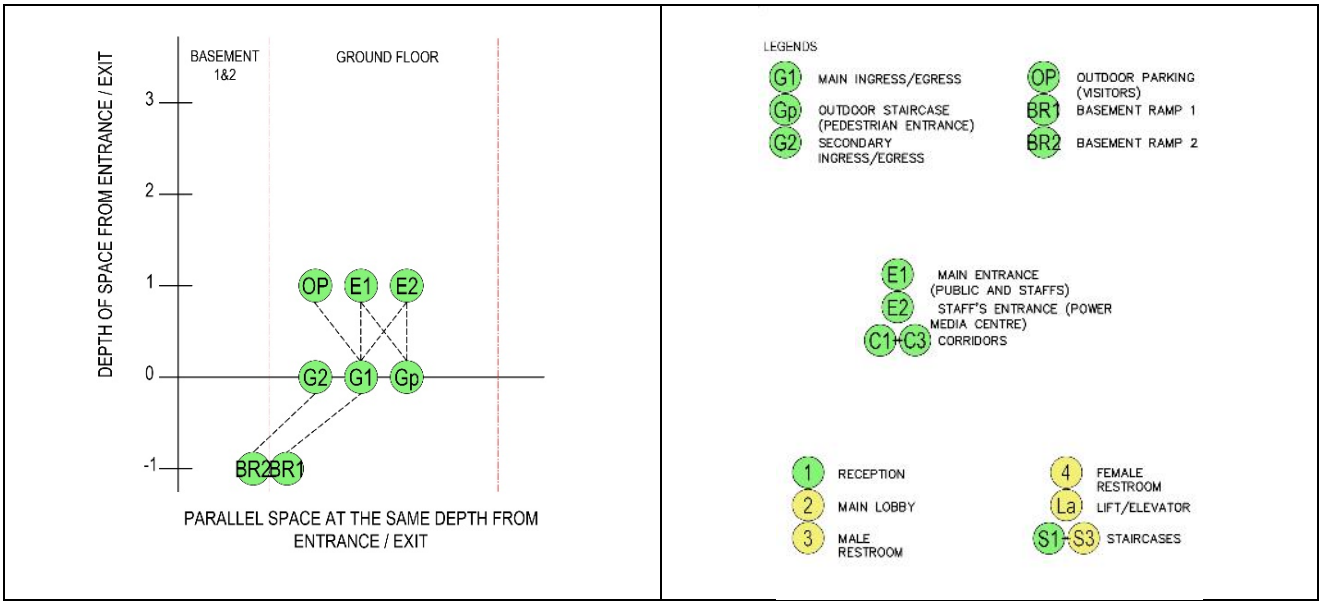

Figure 8: Measurable Scale of the Site Plan

Figure 8 shows the level of permeability of users in context to the site plan. G1, G2 and Gp are located on 0 since it indicates the starting point. Whereas, other areas range of -1 to 1 on the Likert scale for the depth of space from entrance/exit. Since these spaces are still considered the public area, hence both visitors and staffs are allowed to use these spaces. The wayfinding for both staffs and visitors should be easy since the lines connection between spaces in the figure is direct and open; hence it is visible and can easily be noticed by users. Table 5 shows a summary of the analysis.

Table 5: Likert Scale for Space Syntax Analysis of each measurable scale graph for the site plan.

Area	The depth of Space form Entrance / Exit	Level of Permeability	Level of Wayfinding
BR1, BR2	-1	Public	Easy
OP, E1 & E2	1	Public	Easy

Also based on Figure 7, the ground floor plan can be analyzed as follow:

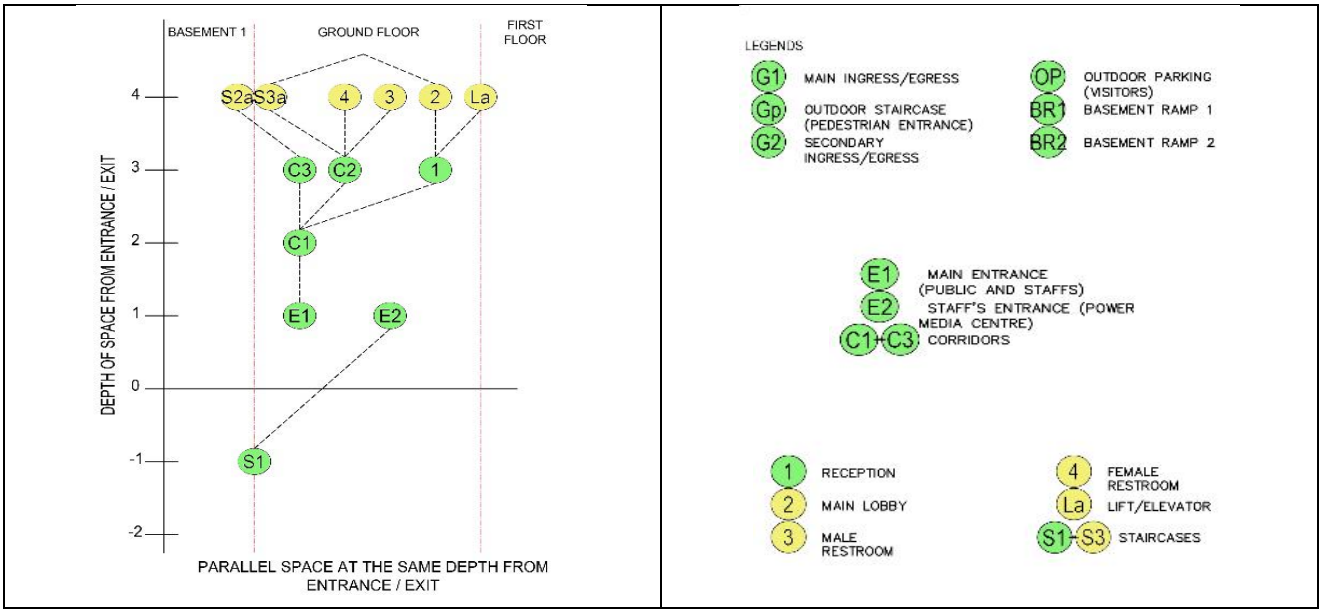

Figure 9: Measurable Scale of the Ground Floor Plan

Figure 9 shows the level of permeability for users in the ground floor plan. The spaces labelled green in the legends indicates public areas as it lands on the scale between -1 and 3. These spaces are allowable for visitors and staffs to access. However, the spaces labelled as restrooms, staircases and lifts fall on the scale of 4, which indicates the semi-public area in yellow. These spaces need permission in order for visitor to access, whereas it is still free for staffs. Through Figure 9, the wayfinding starts to be less noticeable, and visitors might need direction and guide to find. This information is transferred as in Table 6, where the wayfinding level from easy to medium as users enters the spaces. Figure 10 shows the basement level 1 floor plan of the case study building, where the major part of the spaces for a broadcast media centre operates.

Table 6: Likert Scale for Space Syntax Analysis of each measurable scale graph for ground floor plan

Area	The depth of Space form Entrance / Exit	Level of Permeability	Level of Wayfinding
S1	-1	Public	Easy
E1, E2	1		
C1	2		
1, C2, C3	3		
2, 3, 4, La, S2a, S3a	4	Semi-Public/Private	Medium

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Figure 10: Basement Level 1 Floor Plan

Based on Figure 11, the level of permeability for users in the basement level 1 floor plan has become more complex as it is intended to make it less accessible by staffs and restricted to visitors. The users will find it harder on wayfinding through the floor plan without the aid of signage like how it is shown through the lines connecting between each space in Figure 10 and summarized in Table 7.

Table 7: Likert scale for space syntax analysis of each measurable scale graph for basement level 1 floor plan

Area	Depth of space from Entrance/Exit	Level of Permeability	Level of Wayfinding
S1, BR1, BR2	-1	Public - Visitors and staffs are accessible	Easy -The user can easily recognize each space as it is more open and have a large area.
5, 59, 60	-2		
6, C16, 43, R2	-3		
7, 8, C4, C5, C6, 31, 32, C10, 44, C12, S4, S5	-4	Semi-Public/Private - Smaller rooms and unseen from public eyes. But giving privacy to staffs	Medium -A bit harder for the user to find their ways as the layout gets complicated.
S2a, La, 9, 10, C8, 33, C7, 28, 29, 30, 35, 36, 37, 38, C11, 45, C13	-5		
11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 39, 40, 41, 42, 46, 47, 48, 49, 51, C14, Ss, R1	-6		
S3a,11, 12, 13, 14(a-d), 15(a-d), 16(a-d), 17(a-d), 18, 19, 20, 25a, 34, 50, 52, 53, 54, 55, 56, 57, C15	-7	Semi-Private - Only accessible by authorized staffs.	Hard -Hidden inside rooms/space
14e, 15e, 16e, 17e, 58	-8		

Figure 12 shows the basement level 2 floor plan of Power Media Center. Most services are located on this level, so supposedly this area should have been restricted.

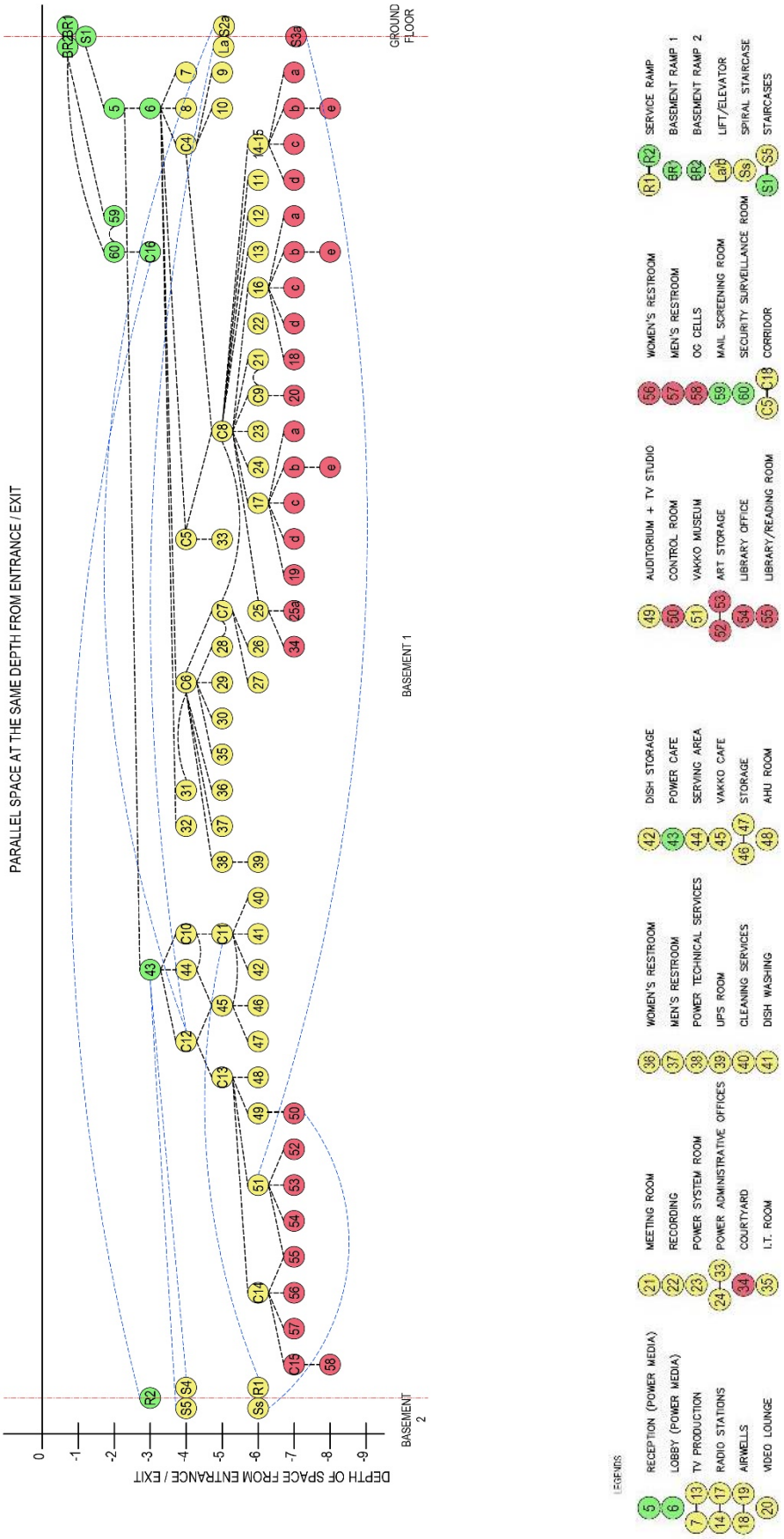

Figure 11: Measurable Scale of the Basement Level 1 Floor Plan

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Figure 12: Basement Level 2 Floor Plan.

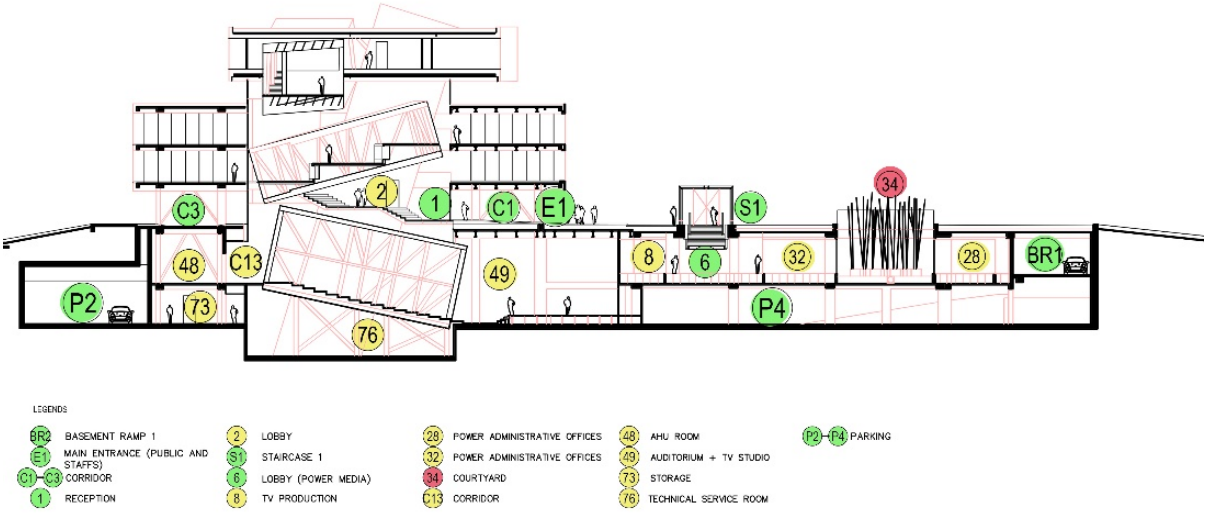

Figure 13: Section.

Figure 14 shows the same complexity level of permeability for users in basement level 2 floor plan compared to basement level 1. From the floor plan of Figure 12, visitors and staff have to go through a security checkpoint (SC) before proceeding into the area. The wayfinding through the floor plan is designed to make visitors or staffs who are not supposed to be there find it hardest, as seen by the haywire lines in Figure 13. Through the floor plan, it can be read that narrow corridor with many doors and hidden rooms makes the user feel disoriented and uncertain of their destination. It was intended as such because the spaces are probably occupied for authorized personnel and significant guests except for the parking areas. All of this is tabulated in Table 8, as shown in Table 8.

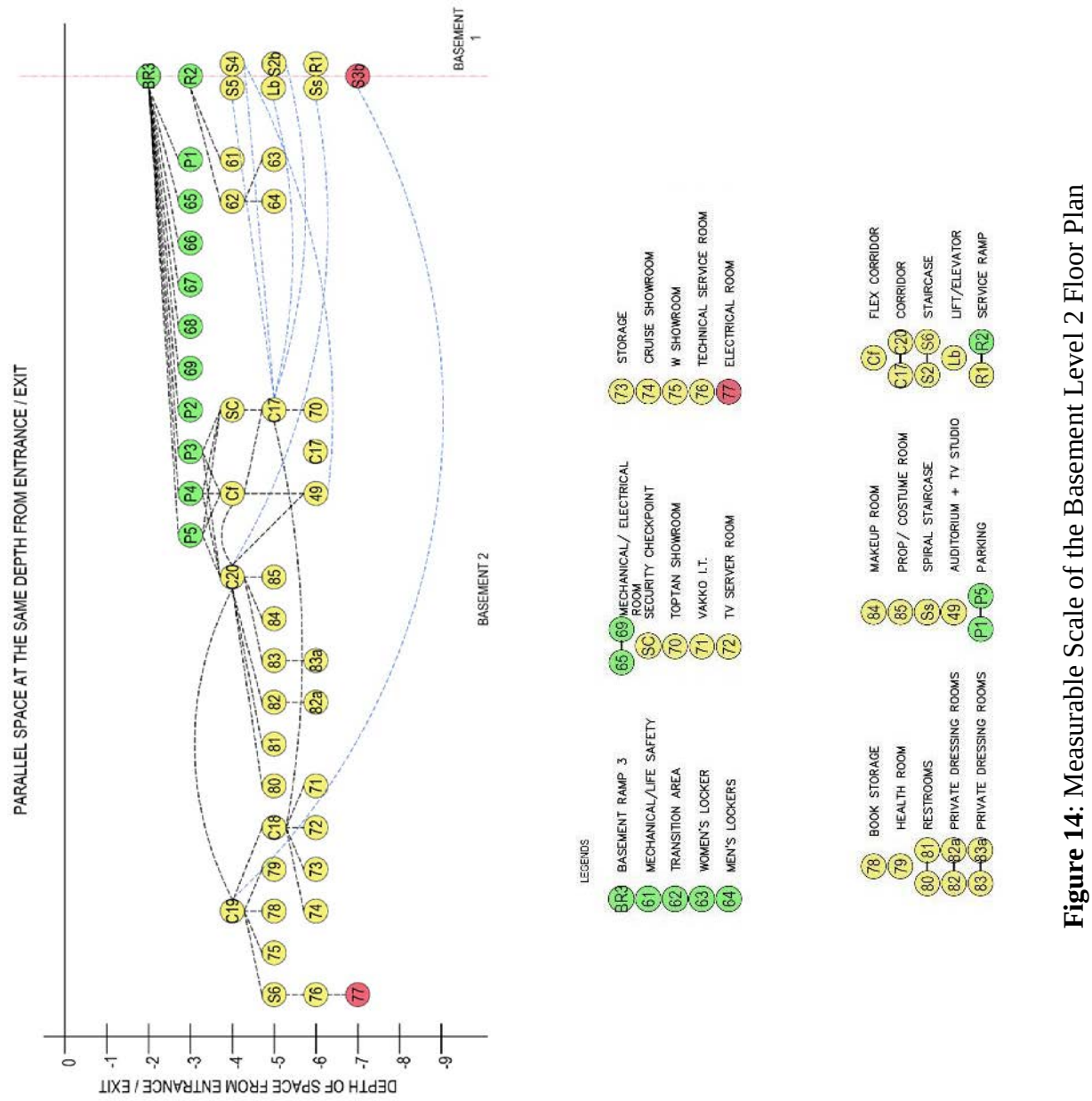

Figure 14: Measurable Scale of the Basement Level 2 Floor Plan

Table 8: Likert scale for space syntax analysis of each measurable scale graph for basement level 2 floor plan

Area	The depth of Space form Entrance / Exit	Level of Permeability	Level of Wayfinding
BR3	-2	Public	Medium
R2, P1, P2, P3, P4, P5, 65, 66, 67, 68, 69	-3		
S4, S5, 61, 62, SC, Cf, C19, C20,	-4	Semi-Public/Private - Only accessible by authorized staffs & guest	Hard
Lb, S2b, 63, 64, C17, S6, C18, 75, 78, 79, 80, 81, 82, 83, 84, 85	-5		
R1, Ss, 70, 49, 82a, 83a, 71, 72, 73, 74, 76	-6		
S3b, 77	-7	Private - Only accessible by authorized staffs	Hardest

Figure 15 shows the measurable graph of the overall floor plans of Power Media Center.

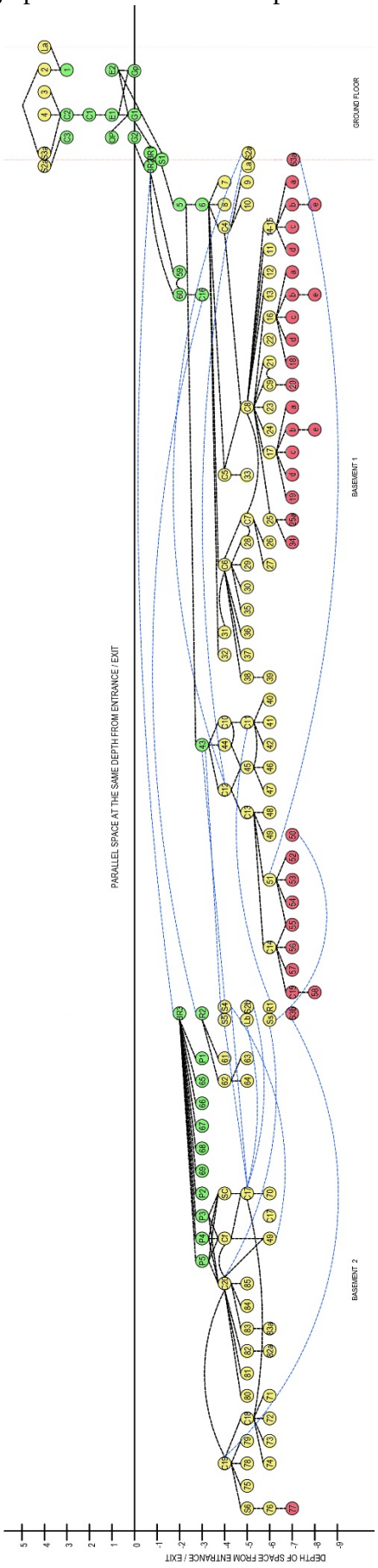

Figure 15: Measurable Scale of the Overall floor plans of Power Media Center

5. DISCUSSION

After analyzing all the layout plans and graphs, the level of permeability from **Public (Green)** > **Semi-Public/Private (Yellow),**> **Private (Red)** can be distinguished on layout plans as shown in Figure 15.

Figure 16: From (Top left) Ground floor plan, Basement level 1 and Basement level 2 floor plan.

Based on Figure 16, it is shown that some of the spaces fall back to its design intend such as the ground level and basement level 1 floor plans where the colours represent users' permeability according to the spaces it was intended. However, as one enters the basement level 2 floor plan, it starts to show a different representation. The spaces were designed to be private, but the graphs show the contrary results as more semi-public/private spaces are seen.

As seen in Figure 15 where the overall graphs are shown, the wayfinding for the users in such building typology is intended to be complicated due to tight security and safety reasons as broadcast media centres are prone to bomb and hostage or hijack threats.

The design of Vakko Headquarters and Power Media Center is basically distinguishable in the level of permeability and wayfinding. The segregation between visitor and staffs access can be seen clearly. The negative about its design is there is no proper drop-off area, and it is design underground where there is limited natural daylight and ventilation. However, this building typology was intended not to create loopholes for threats to come inside the building, and that might be the sole purpose it was designed underground. The design shows that the architect has tackled this by creating a void that acts as a courtyard and also several air & light wells to the basement level. Another complex design to think is the circulation and accessibility for services from the loading to unloading areas into the buildings as these are considered visitors.

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6. CONCLUSION

In conclusion, this research has shown a comparison of an existing layout plans using space syntax analysis for building typology such as broadcast media centre are more complicated in the level of wayfinding and less permeability, especially to public or visitors. For the staffs or workers, there is limited access to the spaces within the building due to security purposes.

The segregation between visitor and staffs access can be seen clearly in the design of the case study building. This building typology was intended not to create loopholes for threats. Hence it was purposely designed to be underground. Due to limited natural daylighting and ventilation, the architect creates a void that acts as a courtyard and also several air & light wells.

The use of space syntax analysis in designing a broadcast media centre is crucial as it helps understand the function of spaces which will help the designer indicate the best layout as guidelines for this building typology. Hence, designing the best functional layout for visitors and staffs separately according to public> Semi-public/private > Private is essential. Therefore, such a link between building circulation and expected ease of wayfinding will be able to assist designers in anticipating the cognitive abilities and limitations of building users.

7. AVAILABILITY OF DATA AND MATERIAL

Information can be made available by contacting the corresponding author.

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