The Influence of Circulation Patterns on The Visitor Distribution in A Shopping Mall
Case Study Palembang Icon Shopping Center, Palembang City

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Article Info	ABSTRACT
	Physiological needs are the most basic human needs. Shopping is one of the measures to fulfill physiological needs, such as clothing, foods, and drinks. Most people prefer to shop in shopping centers as it is more convenient and secure due to its regular spatial pattern, forming a good circulation pattern for their visitors. Palembang Icon is a shopping center in Palembang, located on Jl. POM IX, Lorok Pakjo, Ilir Barat I District, Palembang City, South Sumatra which considered has a good circulation pattern. Palembang Icon has a mall circulation pattern, namely a linear circulation pattern, one lane intended so that all retailers get a strategic place and the circulation orientation becomes clear. This research discusses the Palembang Icon shopping center's circulation pattern and analyzes its influence on the distribution of visitors by using the space syntax method with simulation using the DepthMapX application. The result shows that the circulation space's shape is closed, and the configuration of the circulation path is entirely a linear circulation pattern.

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1. INTRODUCTION

Necessity is everything a man needs to sustain his natural survival by attaining welfare. Abraham Maslow's theory describes a hierarchy of needs that indicates humans' five basic needs and desires. The five stages of basic human need are as follows: the needs of physiology, security, love and belonging, self-esteem, and self-actualization. Physiological needs are the highest priority because when these needs are not satisfied, the rest of the higher levels will not appear to motivate behavior [1]. These needs cover the three essential items: food, clothing, and shelter. This level of need is a fundamental theory for a person to do something to get the need [2].

Shopping is an activity that involves considering purchasing a product or service, looking for a store that provides the best product or service, searching for the desired product or service in the store, and determining the decision to buy. One of the places for shopping that is in great demand by the public is a shopping center, better known as a mall [3].

A shopping center is where transactions happen. It is a place for buying, selling, or trading that creates a dynamic city or local environment besides recreation and entertainment. Shopping centers provide a wide variety of goods and services, with different classes, ranging from the lower middle class to the upper-middle class. Currently, shopping activities are carried out to meet needs and become part of people's lifestyles. In addition to its primary function as a place to shop, shopping centers in general also provide entertainment facilities for visitors such as cinemas, restaurants, play areas, and others [4]. According to

Lynda et al. in Sari [5], a shopping center is a group of retail enterprises and other commercial enterprises planned, developed, owned, and managed as a single property.

According to Rubenstein in Savitri [6], a shopping center is traditionally translated as an elongated area shaded by trees and generally designated as a public walking area. A shopping center with a type of mall is an architectural hub of a recreation room arranged in such a way as to connect two or more hubs surrounded by retail or retail outlets [6].

The shopping mall's function is the shopping center's function: as a place to sell goods, services, dissemination, and more than that is a resort, a focal point of community life around it, and a potential site for domestic and global tourists to visit [7]. According to San Interior (2014), there are three patterns of retail arrangement in shopping centers. Those are (1) a system of many corridors that utilize as much space as possible to be able to put goods so that no space is wasted, (2) a plaza system that utilizes voids as a space for visitors to see all the goods sold, and (3) the mall system which uses a pedestrian sidelined with retail places to sell goods. Based on the configuration of the building, shopping centers can be classified into:

a. Linear form, which is a row of shops, forms a straight line united by the canopy and pedestrians along the front of the shops.
b. The L and U shapes are developments from the linear form of large and community shopping centers.
c. The mall is an area for pedestrians located between opposite linear buildings; then, the mall becomes an area for pedestrians to go back and forth in shopping.
d. Cluster is a development of the mall concept. Still, more emphasis is placed on using several independent building masses, separated by paths for pedestrians or parks, in the application of clusters.

The shopping center's circulation pattern determines the success of the building. Visitors prefer ease and simplicity when deciding where they are going requires a straightforward circulation pattern. In the *Dictionary of Architecture and construction*, Cryill Haris in Lase [8] defines the understanding of circulation as a traffic pattern or movement within an area or building within a building. Understanding a movement pattern provides flexibility, economic and functional considerations in traffic patterns. Circulation is the element that organizes and links between the different parts of shopping malls, such as shops, anchor stores, and other mall facilities [9]. Movements in a space or area should have a particular pattern to suggest a sense of circulation. The architectural elements connect them and link one room to the other. A shopping center is a retail group or another kind of shopping designed, developed, and managed as a single property that guarantees a commercial profit to tenants [10].

Palembang Icon shopping center is a mall in Palembang City managed by Lippo Group, first opened in 2014. This shopping center has received particular attention in the hearts of visitors because it is the first shopping center in Palembang City that sells famous brand goods. Palembang Icon shopping center, located at Jl. POM IX, Lorok Pakjo, Ilir Barat I District, Palembang City, South Sumatra, is a shopping center in Palembang that has a good circulation pattern. This shopping center consists of five floors. Palembang Icon has a mall circulation pattern. The circulation pattern is a linear one-lane configuration intended so that all retailers get a strategic place and the circulation orientation becomes clear [11]. The clear circulation orientation allows all retailers to be passed by all visitors to distribute evenly.

According to Ade Syoufa [4] on *Pengaruh Pola Sirkulasi Pusat Perbelanjaan Mal Terhadap Pola Penyebaran Pengunjung* research report, linear circulation allows all visitors to go to the entire area in the Margo City building. The circulation of visitors starts from the entrance door and is then directed towards the end of the building. In addition, the presence of magnets or anchor tenant at each end of the floor makes the distribution of visitors on each floor evenly.

In this journal, the author will discuss the effect of circulation patterns on the distribution of visitors at the Palembang Icon shopping center. The circulation pattern is designed to pass through retail and be profitable for retail tenants and shopping center organizers. In addition, the circulation pattern will determine the success or failure of the function of a building.

2.   RESEARCH METHOD

The research uses the descriptive method. The descriptive method collects data according to facts and what appears at the site. For example, visitors' circulation patterns at the Palembang icon shopping center were collected and simulated to find how the circulation pattern affects the distribution of visitors. The research is simulated with Depthmax's program Space Syntax.

In Space Syntax, the interior is understood as roads, boxes, rooms, parks, and many more. At the same time, barriers may restrict access and block views such as walls, fences, furniture, partitions, and other

barriers [12]. Space syntax is a method of observing and tunneling for space integration, visually and optimally moving [13]. Space syntax is one of the tools that can provide the invention of space configuration. The configuration of space is a vessel having a relation where objects are interconnected. It forms a region structure that humans can use in carrying out each activity [14].

Space Syntax's methods have two essential tools for their development. First, space becomes the thing to understand that space is not the background of human activity, but it becomes the thing that belongs there. Second, space becomes a significant and vital configuration [15]. The breakdown of organizational, layout, and space production is influenced mainly by the relationship between space and its inhabitants. In other words, how good the space of the object is. Space configuration is a set of relationships in which things interrelate in a single structure; understanding space configuration will significantly affect the completion of the organization, layout, and space circulation [16].

The space in Space Syntax is understood as a path, box, room, garden. Some obstructions may restrict access and obstruct views such as walls, fences, furniture, partitions, and other obstacles. The building consists of a series of rooms; each room has at least one relation to another room. A building can consist of a configuration of spaces, and there is a connecting space as a place for movement and activities of building users.

First, the data collection method used to obtain the floor plan, circulation, and spatial configuration is the phenomenon method, with direct observation and measurement. Later, the observation method gets the identification of places that attract visitors.

In DepthMapX, the color parameter ranges from low values are indicated by blue grading to green, intermediate values are indicated by green grading to yellow, and the highest value is indicated by yellow to red gradations [12].

Figure 1. Color parameter in DepthMapX

In Space Syntax, there are three aspects: connectivity, integrity, and intelligibility. Connectivity is a dimension to measure local properties or spatial relationship values by calculating the number of spaces that are directly connected to other areas in a spatial configuration. Integrity is a dimension that measures the global property of the depth of space by showing how deep space is concerning all other spaces in a spatial configuration. Finally, intelligibility value is the level of understanding of space configuration perceived by the user, the combination or correlation between the values between local-scale measurements (Connectivity) and global scale measurements (integrity). First, the intelligibility value is known by looking at the value of R^2. Later, it can be analyzed using the effect parameter of a space based on the table below.

Table 1. Success parameter in intelligibility calculation

Parameter Number	0-0.4	0.5-0.7	0.8-1.0
Description	Bad	Fair	Good

3. RESULTS AND DISCUSSION

Palembang Icon shopping center has two types of circulation space, namely enclosed space and open space on one side. The form of enclosed circulation space dominates the Palembang Icon shopping center. The enclosed circulation space is formed by a circulation path where retail rows are on the right and left sides of visitors walking through circulation. The types of circulation space forms at the Palembang Icon shopping center are described as follows:

Figure 2. Circulation space at palembang icon mall

3.1. Circulation Space Configuration

The configurations of the visitor circulation space at the Palembang Icon shopping center are shown in Table 2.

Table 2. Circulation configuration type of Palembang icon shopping center

Floor	Pattern	Circulation Configuration Type
Ground Floor		Linear Circulation
Upper Ground Floor		Linear Circulation
1st Floor		Linear Circulation
2nd Floor		Linear Circulation
3rd Floor		Linear Circulation

→ Main Entrance
→ Visitor Circulation Path

The configuration of the circulation path at the Palembang Icon shopping center is entirely a linear circulation pattern. The linear pattern is a one-way pattern intended so that all retailers get a strategic place and the circulation orientation becomes clear.

3.2. Simulation Using Program

The objectives of the simulation are to determine the spatial configuration and measure the effectiveness of circulation space to find out how easy the configuration is to be understood by visitors. This study uses a Space Syntax simulation to investigate the level of effectiveness of the space by using several aspects. Those are (1) aspects of connectivity (level of spatial connectivity), (2) integrity (level of space convenience to be achieved), (3) Intelligibility (level of visitor understanding on room configuration), and (4) Gate Counts (level of visitor density) to indicate in which areas the most activity occurs. The programs used to simulate the circulation pattern of the Palembang Icon shopping center are AutoCad and DepthMapX.

Table 3. Simulation results from ground floor

Ground Floor	
Connectivity	**Integrity**

Minimum	Average	Maximum
1	301.46	542

Minimum	Average	Maximum
1.77	4.92	9.33

High spatial connectivity is found at the meeting point of circulation paths A and B and circulation B and C. These A, B, and C circulations are space liaisons because of their wider dimensions and their position in the middle.

Easy access to space with high and medium intensity is in circulation C, B, and E. In contrast, circulations other than those mentioned have a value that tends to be low.

Gate Counts	**Intelligibility**

Minimum	Average	Maximum
1	475.48	2346

R◆ = 0.260393
y = 0.00632294 x + 0.00632294

The circulation area that most visitors pass is circulation B and C, which are the connecting spaces.

The level of clarity of the configuration of the space is included in the less effective category, so it is less clear and a little difficult for visitors to understand.
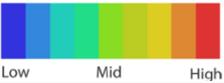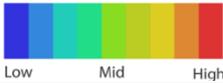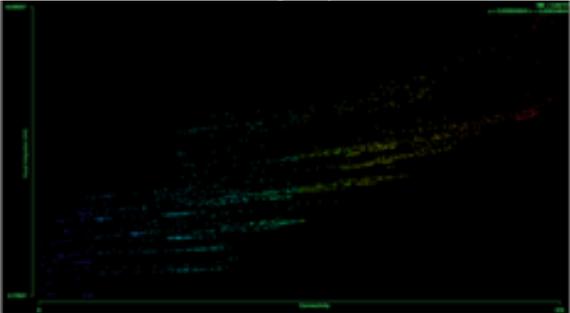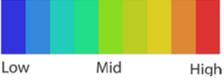
The distribution pattern of visitors mainly occurs in circulation rooms B and C as spaces that are easy to access because of their middle and high spatial connectivity. However, the space configuration on this floor is less effective, so it is less clear and a little difficult for visitors to understand.

Table 4. Simulation results from upper ground floor

Upper Ground Floor	
Connectivity	**Integrity**

Minimum	Average	Maximum
6	246.69	539

Minimum	Average	Maximum
2.19	4.71	8.89

The high level of spatial connectivity is in the circulation space F because its dimensions are wider and elongated and connect many spaces. The position of the circulation room F is adjacent to the anchor tenant.

Easy access to space is in circulation B, C, and F, while the circulations other than those mentioned have low accessibility values.

Gate Counts

Minimum	Average	Maximum
1	235.81	1206

Intelligibility

R◆ = 0.361144
y = 0.00565647 x + 0.00565647

The circulation area most visited by visitors is the meeting between circulation A and circulation B, circulation B and circulation C, and circulation D and circulation F.

The level of clarity of the configuration of the space is included in the less effective category, so it is less clear and a little difficult for visitors to understand.
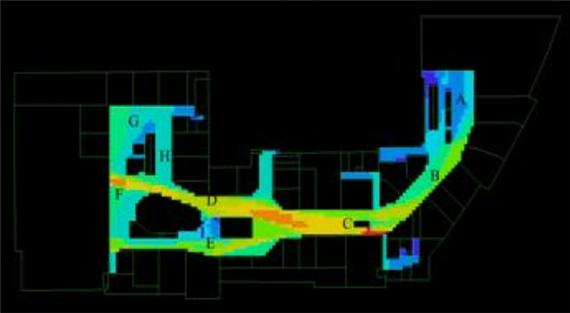
The distribution pattern of visitors mainly occurs in circulation rooms B, C, and F as spaces with wider dimensions and are easy to access because of their middle and high spatial connectivity. However, the space configuration on this floor is less effective, so it is less clear and a little difficult for visitors to understand.

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Table 5. Simulation results from 1st floor

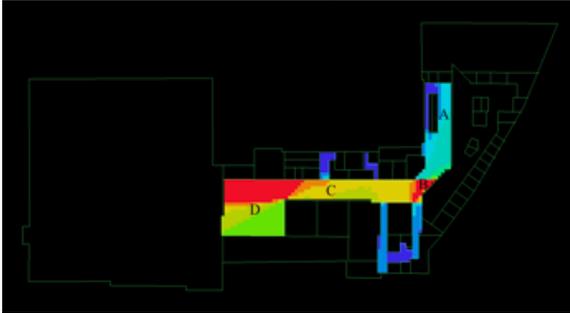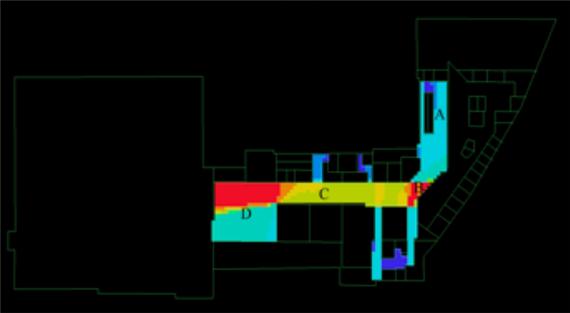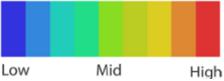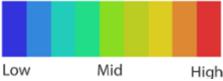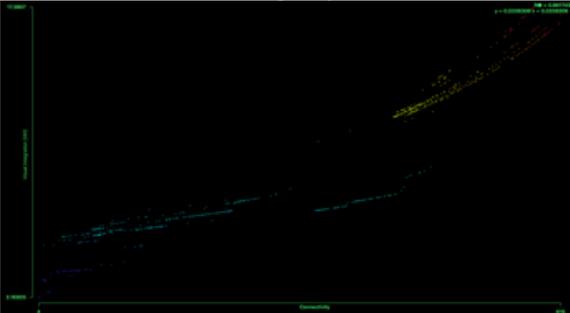| 1st floor	
Connectivity	**Integrity**
Minimum 6 Average 225.8 Maximum 515	Minimum 2.18 Average 4.61 Maximum 9,08
The high level of spatial connectivity is in circulation room B, circulation C, and circulation F because the dimensions are wider and longer and connect many spaces.	Easy access to space with moderate average intensity is in circulation C and F, while the circulations other than those mentioned have low accessibility values.
Gate Counts	**Intelligibility**
Minimum 1 Average 252.61 Maximum 1110	R♦ = 0.66737 y = 0.00834844 x + 0.00834844
The circulation area visitors most visit is the meeting between circulation A and circulation B, circulation B and C, and circulation D.	The clarity of room configuration is included in the category of quite effective, clear, and easy for visitors to understand.

The distribution pattern of visitors mainly occurs in circulation room B, circulation C, circulation D, and circulation F as circulation spaces with wider dimensions and are easy to access because of their position in the middle and high spatial connectivity. Therefore, the space configuration on this floor is included in the category of being quite practical, straightforward, and easy for visitors to understand.

Table 6. Simulation results from 2nd floor

2nd floor	
Connectivity	**Integrity**

Minimum	Average	Maximum	Minimum	Average	Maximum
8	298.13	627	2.35	5.94	10.62

The high spatial connectivity is found in circulation C, the meeting point of circulation paths C and D, and circulation F, a space liaison, because it has wider dimensions and its position is in the middle.

Easy access to space is in circulation C, the meeting point between circulation C and circulation D, and circulation F. Other than the mentioned circulation, the value of easy access is low.

Gate Counts	**Intelligibility**

Minimum	Average	Maximum
1	240.70	1249
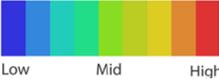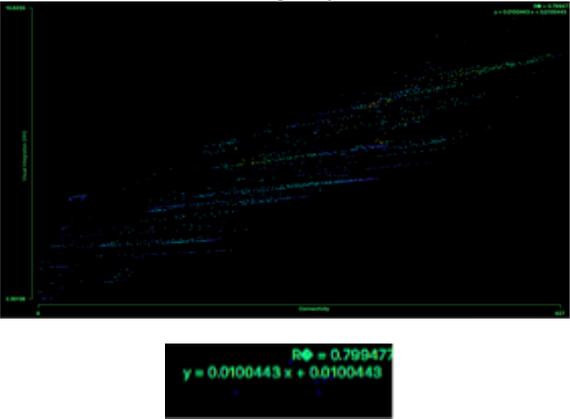
R♦ = 0.799477
y = 0.0100443 x + 0.0100443

The circulation areas visitors most visits are B, C, and D.

The clarity of room configuration is included in the category of quite effective, clear, and easy for visitors to understand.
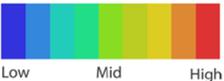
The distribution pattern of visitors mainly occurs in circulation room B, circulation C, circulation D, and circulation F as circulation spaces with wider dimensions and are easy to access because of their position in the middle and high spatial connectivity. Therefore, the space configuration on this floor is included in the category of being reasonably practical, straightforward, and easy for visitors to understand.

Table 7. Simulation results 3rd floor

3rd floor	
Connectivity	**Integrity**

Minimum	Average	Maximum
4	342.24	615

Minimum	Average	Maximum
2.17	9.62	17.39

The high level of spatial connectivity is in circulation rooms B, C, and D because the dimensions are wider and elongated so that many spaces are connected. In addition, circulation B and circulation D are adjacent to anchor tenants.

Easy access to space is in circulation B, circulation C, and circulation D. Circulations other than those mentioned have a low accessibility value.

Gate Counts	**Intelligibility**

Minimum	Average	Maximum
1	451.43	1609

The circulation areas that visitors most visits are circulation B and circulation C.

The clarity of space configuration is included in the category of effective, self-explanatory, and easy for visitors to understand.

The distribution pattern of visitors mainly occurs in circulation rooms B, C, and D, as circulation spaces with wider dimensions are easy to access because of their middle and high spatial connectivity. Therefore, the space configuration on this floor is effective, noticeable, and easy for visitors to understand.

4. CONCLUSION

Based on the analysis of the influence of the circulation pattern of the Palembang Icon shopping center on the distribution of visitors, several conclusions can be drawn, namely that the enclosed circulation space dominates the Palembang Icon shopping center. The closed-form circulation space is where retail rows are on the right and left sides of visitors walking through circulation. Furthermore, the discussion and analysis results concluded that the configuration of the circulation path at the Palembang Icon shopping center is entirely a linear circulation pattern. The linear design is a one-way pattern that is intended so that all retailers get a strategic place and the circulation orientation becomes clear.

Table 8. Conclusion

Floor	Conclusion
Ground Floor	The distribution pattern of visitors mainly occurs in circulation rooms B and C as accessible access spaces because of their middle and high spatial connectivity. However, the space configuration on this floor is less effective, so it is less clear and a little difficult for visitors to understand.
Upper Ground Floor	The distribution pattern of visitors mostly occurs in circulation room B, circulation C, and circulation F as spaces with wider dimensions and are easy to access because of their position in the middle and high spatial connectivity. However, the space configuration on this floor is less effective, so it is less clear and a little difficult for visitors to understand.
1st floor	The distribution pattern of visitors mainly occurs in circulation rooms B, C, D, and F as circulation spaces with wider dimensions and are easy to access because of their middle and high spatial connectivity. Therefore, the space configuration on this floor is included in the category of being quite effective, clear, and easy for visitors to understand.
2nd floor	The distribution pattern of visitors mainly occurs in circulation rooms B, C, D, and F as circulation spaces with wider dimensions and are easy to access because of their middle and high spatial connectivity. Therefore, the space configuration on this floor is included in the category of being quite effective, straightforward, and easy for visitors to understand.
3rd floor	The distribution pattern of visitors mostly occurs in circulation rooms B, C, and D, as circulation spaces with wider dimensions are easy to access because of their middle and high spatial connectivity. Therefore, the space configuration on this floor is effective, self-explanatory, and easy for visitors to understand.

The space syntax simulation in Table 3 shows the distribution pattern of visitors mainly occurs in circulation rooms B, C, D, and F on each Floor. It is because circulation rooms B, C, D, and F are the main circulation spaces located in the middle, have wider dimensions, and have a high level of spatial connectivity. In other circulation spaces, namely, spaces A, E, and G, the distribution pattern of visitors tend to be at medium and low levels. Therefore, the space configuration on the 3rd floor is in the very effective category; it is pretty influential on the 1st and 2nd floors. However, the ground and upper ground floors are less effective because spatial connectivity and ease of reaching space are in a low category.

Linear circulation at the Palembang Icon shopping center affects (1) aspects of the level of connectivity, (2) the level of convenience of space to be reached (integrity), (3) the intensity of visitor density (gate counts), and (4) the level of understanding of visitors on the configuration of the space (intelligibility) and these aspects affect the visitor distribution. The simulation results show that the distribution of visitors mainly occurs in circulation rooms B, C, D, and F with high levels, and circulation spaces A, E, and G with the distribution of visitors mostly being at moderate levels, and only a tiny part at low levels. The distribution of visitors at the Palembang Icon shopping center is still not evenly distributed. However, from the distribution level of visitors, there is no significant difference because most of them are still at high and medium levels.

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REFERENCES

[1]   W. K. Noor and U. Qomariyah, "Hierarki Kebutuhan Sebagai Dasar Refleksi Diri Tokoh Dalam Novel Pesantren Impian," *J. Sastra Indones.*, vol. 8, no. 2, pp. 103–110, 2019, doi: 10.15294/jsi.v8i2.28750.

[2]   P. Hariyono, "Arsitektur Humanistik Menurut Teori Maslow," *Pros. SNST Fak. Tek.*, vol. 1, no. 1, pp. 26–31, 2014, Accessed: Feb. 07, 2022. [Online]. Available: https://publikasiilmiah.unwahas.ac.id/index.php/PROSIDING_SNST_FT/article/view/1039.

[3]   R. R. D. Asih and L. A. Pratomo, "Peran Mediasi E-Satisfaction dan E-Trust Terhadap E-Loyalty," *J. Manaj. dan Pemasar. Jasa*, vol. 11, no. 1, pp. 125–144, Mar. 2018, doi: 10.25105/jmpj.v11i1.2537.

[4]   A. Syoufa and H. Hapsari, "Pengaruh Pola Sirkulasi Pusat Perbelanjaan Mal Terhadap Pola Penyebaran Pengunjung Studi Kasus: Margocity, Depok," *J. Ilm. Desain Konstr.*, vol. 13, no. 2, pp. 46–57, 2014, [Online]. Available: https://www.ejournal.gunadarma.ac.id/index.php/dekons/article/view/1135.

[5]   G. T. Sari, "Pusat Perbelanjaan Mall Di Kabupaten Kubu Raya," *J. online Mhs. Arsit. Univ. Tanjungpura*, vol. 5, no. 2, pp. 1–12, Sep. 2017, Accessed: Feb. 07, 2022. [Online]. Available: https://jurnal.untan.ac.id/index.php/jmarsitek/article/view/21553.

[6]   R. Savitri, "Pusat Perbelanjaan Modern (Mall) Dengan Penekanan Ruang Terbuka Publik," *J. online Mhs. Arsit. Univ. Tanjungpura*, vol. 6, no. 2, pp. 229–245, Jan. 2018, Accessed: Feb. 07, 2022. [Online]. Available: https://jurnal.untan.ac.id/index.php/jmarsitek/article/view/30631.

[7]   W. I. Rachmani and M. Hidayat, "Studi Penentuan Lokasi Potensial Pengembangan Pusat Perbelanjaan di Kota Tangerang," *J. PLANESA*, vol. 2, no. 1, pp. 57–64, 2008, Accessed: Feb. 07, 2022. [Online]. Available: https://ejurnal.esaunggul.ac.id/index.php/planesa/article/view/535.

[8]   F. P. Lase, A. B. Purnomo, and Nuzuliar, "Penataan efisiensi sirkulasi ruang dalam dan ruang luar untuk disabilitas pada stasiun mrt lebak bulus 1)," *Semin. Nas. Pakar ke-2*, vol. 0, no. 0, pp. 1–8, Apr. 2019, Accessed: Feb. 07, 2022. [Online]. Available: https://www.trijurnal.lemlit.trisakti.ac.id/pakar/article/view/4159.

[9]   M. Lusiana and S. M. Sari, "Aplikasi Sirkulasi Fungsional pada Interior Shopping Mall 'Tunjungan Plaza' di Surabaya," *Intra*, vol. 2, no. 2, pp. 555–562, 2014, [Online]. Available: http://publication.petra.ac.id/index.php/desain-interior/article/view/2245.

[10]   Andi, Z. Zain, and U. F. Andi, "Pengaruh Konfigurasi Ruang Terhadap Jumlah Pengunjung pada Bangunan Komersial Mal di Pontianak," *Ruang Sp.*, vol. 8, no. 1, pp. 45–60, 2021, Accessed: Feb. 07, 2022. [Online]. Available: https://ojs.unud.ac.id/index.php/ruang/article/view/63897/39357.

[11]   J. Oktaviana, "Pengaruh Pola Sirkulasi Terhadap Persebaran Pengunjung Pusat Perbelanjaan Palembang Icon," Perpustakaan Universitas Katolik Musi Charitas, 2021.

[12]   S. A. Mutmainnah and I. Martiningrum, "Pola Persebaran Pengunjung di Mall Olympic Garden Malang," *J. Mhs. Jur. Arsit.*, vol. 6, no. 3, pp. 1–11, 2018, Accessed: Jan. 05, 2022. [Online]. Available: http://arsitektur.studentjournal.ub.ac.id/index.php/jma/article/view/600.

[13]   M. F. Romdhoni, "Analisis Pola Konfigurasi Ruang Terbuka Kota Dengan Penggunaan Metoda Space Syntax Sebagai Spatial Logic dan Space Use," *NALARs*, vol. 17, no. 2, pp. 113–128, Jun. 2018, doi: 10.24853/nalars.17.2.113-128.

[14]   M. Karmila and N. S. Magfiroh, "USING SPACE SYNTAX TO DETERMINE THE FORM AND PATTERN OF HERITAGE SITE (Case Study: Sangiran Heritage Site)," *J. Planol.*, vol. 15, no. 1, p. 81, 2018, doi: 10.30659/jpsa.v15i1.2762.

[15]   A. H. Sa'diyah, R. Nugroho, and O. Purwani, "Space Syntax Sebagai Metode Perancangan Ruang pada Galeri Kreatif di Kota Surakarta," *J. SENTHONG*, vol. 2, no. 2, pp. 807–816, 2019, Accessed: Feb. 07, 2022. [Online]. Available: https://jurnal.ft.uns.ac.id/index.php/senthong/article/view/1052.

[16]   I. Nurhidayat, O. Purwani, and Samsudi, "Penerapan Teori Space Syntax Pada Bangunan Pusat Ekshibisi Di Jakarta," *Senthong*, vol. 1, no. 2, pp. 153–160, Jul. 2018, Accessed: Feb. 07, 2022. [Online]. Available: https://jurnal.ft.uns.ac.id/index.php/senthong/article/view/715.

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