Sense of Place as a Tool in Assessing Data from Digital Images on Instagram
Case Study: Bandung on Instagram

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ABSTRACT

The impact of Instagram as social media on city planning is studied continuously. Researchers tried to see a pattern formed by the data they collected from either the Instagram geotagging/like/follow feature or user experience from using Instagram. However, these researches appeared to lack a method of filtering data from an image posted by Instagram users. The Sense of Place as an analytical concept is an indispensable tool when considering city planning activity by using the concept of sense of place as an analytical tool to filter data from digital images posted on Instagram, this paper attempt to be able to aid planners in their effort to plan the city better.

Keywords: Digital, Design, Space, Place.

1. INTRODUCTION

The fast growth of Information Technology has made it easier for people to share all kinds of information with the world. Starting from newspaper, radio, and TV, the rapid emergence of internet-based technology has created a new and fast stream of information in a place people often called online or virtual. While online is a term often applied in a situation such as being connected to an information-technology, On the other hand, "virtual space presents a unique environment of its own: an environment in which individuals and organizations are continuously producing, packaging, re-packaging, recording, discarding, modifying, transferring, disseminating, accessing, and using information." [1] By going with this term, a virtual space is interconnected with information technology and expanded by the internet presence.

To say that the fast stream of information in a space people called virtual is affecting our everyday life in our real world is to state the obvious for most planners all across the world because studies concerning this matter are not hard to find. Among the most recently used data sources made available for research purposes, social media data represent a challenging ground for their wide diffusion among people and the influence that virtual

relations have on using the city's physical space. [5] However, typically, data forms used in this type of research are textual or numerical data. This paper proposes to compose a new way of procuring data in the form of images and photos.

One of the most popular social media that offers a feature to share information in images is Instagram. Founded in 2010, Instagram is a social media designed to share its user's everyday life in images. With at least 500 million users and photo uploads reaching 95 million per day [7], Instagram allows its user to access images from a location from various places around the world. Numerous development and planning research involving Instagram as their data source has been done over the past few years.

The data taken by this research is oriented towards numerical or textual based to recognize a pattern formed by Instagram's features or qualitative data from its user interviews. There is a lack of study using basic physical planning theory to analyze raw information in the images.

Space is a fundamental analytical concept for all physical planners; whether they are a city planner, an architect, or interior design, space will always be part of their work. Planners turned spaces into places, and users experience those places [10] that later shaped their sense

of that place. Those images Instagram users posted in their accounts are usually photographs of all kinds of places. Based on that assumption, it is proper to apply the sense of place as an analytical concept to assess information from photographs circulated through Instagram's posts. This paper attempt to screen Instagram posts on how the users experience places in our real world, aiding planners in accessing feedback of their designs.

2. SPACE, TIME, PLACE, AND SENSE OF PLACE

2.1 Space and Time

People often understand space as roominess, emptiness, length, and distance. However, what could indicate the existence of space itself? Many experts have tried to solve this subject for more than a century. Tuan [13] suggested the ability to move is what could indicate the existence of space. This theory could serve as the basic Space theory that would help much further understand space's concept. The ability to move could not explain space but could also indicate the existence of time.

"Space, we have noted, is given by the ability to move. Movements are often directed toward or repulsed by objects and places. Hence space can be variously experienced as the relative location of objects or places, as the distances and expanse that separate or link places, and—more abstractly—as the area defined by a network of places." [13]

The ability to move gives us an understanding of space and then forms our spatial knowledge. [13] From that definition, we could conclude that space creates our experience of space and then forms our spatial knowledge.

Lefebvre [10] has a more structured way in his attempt to understand the production of space. In his study, he concludes that space is a product. Lefebvre creates a triad to help understand the production of space, that is, spatial activity, representative of space, and representational space. The triad set a rule in space production, according to Lefebvre. While spatial ability is represented in the first of the triad, that is the spatial activity; the two others explain a role in space production. The representative of space is how space is produced in a particular way by those who have access to spatial planning; the representation of space is how the produced space is experienced by their user, who then creates symbolism to the spaces.

"Perhaps we shall have to go further, and conclude that the producers of space have always acted in accordance with a representation, while the 'users' passively experienced whatever was imposed upon them

in as much as it was more or less thoroughly inserted into, or justified by, their representational space." [10]

In conclusion, Lefebvre proposes that the production of space has a conductor, but the conductor act by how people use the space itself, then generating mutual feedback from each part of the triad. Spatial activity represents experience, representations of space act as a regulation, and representational space serves as space knowledge. However, Lefebvre's perception from his theory is that he assumed that space is produced in an absolute way. Thus, creating the illusion that there is a specific space that is time unbound.

2.2 Sense of Place

To understand the sense of place, first, we have to understand the concept of place. Place is a term used by people to name a space. Broadly defined, a place is a local environment inspired by the meaning and significance of those associated with it. [12] According to Yi Fu Tuan, a place is formed from experience (Figure 1).

"From space to place: learning a maze. At first, only the point of entry is clearly recognized; beyond lies space (A). In time, more and more landmarks are identified, and the subject gains confidence in movement (B, C). Finally, space consists of familiar landmarks and paths—in other words, place (D)." [13]
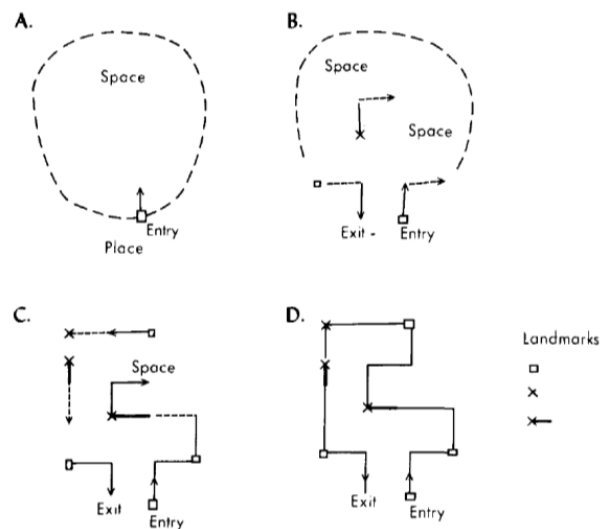

Figure 1 From space to place. Source: [13].

Space becomes a place when there is a particular thing experiencing it. Let's say a child is learning about what home is. At first, he will think of home as a place where he is free to moves around, and then he will learn that home is a place where his parents always come back from outside. His understanding of home grew along with his age and experiences. However, that does not make space an absolute setting for a place to form. Space would continuously change from time to time. A

bedroom of a newborn would likely be much different from a teenager one. The basic explanation of this is because their movement is also much different.

From here, we can then discuss the definition of sense of place. When space is experienced and become a place, then during the process of gaining experience from space, a sense of that place will also be simultaneously formed. An emotional event, spatial knowledge of the space, time sensitivity, previous experiences from other places, norms, and regulations practiced on the place form this sense of place as he experienced it. Therefore, forming a place cannot be separated from forming a sense of its place. Say that a teenager walks into his old bedroom. His sense of that place work to change the place itself. When he is still a child, it was his bedroom, and now it is a place he called "my childhood bedroom." It is the same room experienced by the same person, and yet it becomes two different places as movement and senses change.

A sense of place determined a person's attachment to a place. Cantrill [2] indicated that a strong sense of place played a crucial role in determining whether individuals became involved in local advocacy efforts. Making a positive experience to form a strong sense of place is a vital task for planners and designers to consider.

3. THE EXISTENCE OF SPACE ON INSTAGRAM

Typically when we talk about space, our mind pictures a physical room or place in our physical world. The one we can see, hear, smell, touch, and even taste. But what about space inside a media social? Many debates the existence of space inside what people often call the virtual world. Those who denied its existence persist that space needed to be experienced directly by all of our senses. While what existed in the virtual world is mere digital data. However, there are some people born without the full ability of senses. Does that mean space cannot exist for them?

"Koster [9] declared Persistence and Numerous Participation as the essential characteristics of virtual worlds and posited that virtual worlds are virtual spaces where participants represent themselves through avatars. Castronova [4] determined that these are the computer-based environments that could be used by a large number of users simultaneously." [6]

New studies have begun to try to define the virtual world as space. Though, the definition of the word virtual itself is vague and ambiguous, as the word virtual is often used to describe something that almost exists but not entirely. Nevertheless, the truth is, the virtual world does exist in our reality, in the form of digital data. So the right word to describe space in the world created by Information Technology is digital

space because it is a space arranged by digital data inside our digital devices.

By this conclusion, we can then assume that there is also space on Instagram, and when this space existed and is experienced, it becomes a place for the user. Initially, Instagram was created as a social media platform for people to share images of their everyday life. "The social function of Instagram is that it enables users to contact and interact with society or relieve anxiety and tension. In other words, Instagram provides evidence for the uses and gratifications theory." (Huang, Su, 2018)

In a newer attempt to define space, Potts (2015) has explained how many people assume an era of nothingness. This assumption is formed centuries ago by religions or mythology. Thus according to many religions, anything that comes from nothing will return to nothing. In his book, he explains how people still assume that time is a cycle. What has been created in the past can be brought back in the future. His explanation somehow resonates with Lefebvre's perception of space. The past cannot be relived, and new spaces are created, including digital space.

Instagram proves its function as a space that provides an experience for its users. Thus, allowing users to create their place in that space. Generally, Instagram is a digital place for people to connect and share information in digital images with each other. However, the sense of digital place on Instagram from its users varied, depending on their experiences and knowledge. What needed to be understood is the full functions of Instagram. How wide and open its connectivity is. How easily their images reach people thousands of kilometers away, thus informing them of what is happening around those images owner. But that is not all. Instagram features to like and follow other people's posts could also indicate which kind of information people prefer to accept.

4. BANDUNG ON INSTAGRAM
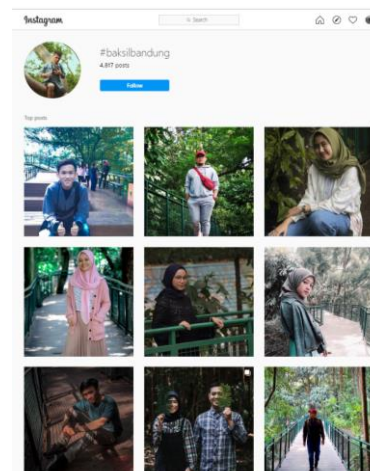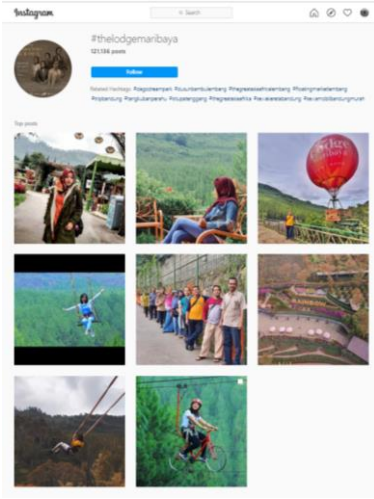
Figure 2 (a) Top Post Tagging Maribaya and (b) Top Post Tagging Babakan Siliwangi Bandung. Source: [14]

Using Bandung Greater Region as a study case, we tried to propose an issue started by Instagram. Visual information of many places in the Bandung Region could easily be accessed from Instagram by using hashtags (Figure 2). But nobody could guarantee the quality of each of the images that represent many places in Bandung.

"With reference to photography, any individual with a camera phone or digital camera has the means of being a photo-journalist; any individual can publish their photographs in an online blog or virtual gallery." (Potts, 2015)

Thus, to steer Instagram users to distinguish the quality of each representation of the place properly, an analysis using the concept of sense of place applied to the images uploaded by users (Figure 2) and identifying pattern of the uploaded photos in their account to determine their sense of place towards Instagram needed to be done.

5. RESEARCH METHODS

The first step done in this research is determining the criteria of Instagram users used for this paper. The first criteria are the user needs to be an active user of Instagram, implying that they have to use Instagram for the last six months regularly and have a consistent experience using Instagram. Second, their followers have to be 300 or more, so he or she would have an audience. Third, they would also have to frequently upload a photo taken in Bandung Region from various places. Fourth, there is a pattern in how they uploaded their photos, showing their attachment towards a specific pattern instead of just using Instagram randomly.

As the primary purpose of this research is to formulate a new research method to use in digital space, not digging into large group behavior, using a small

amount of data appears to be sufficient to show a pattern in user behavior rather than using a vast amount of data, avoiding repetitive patterns in paper format. Nine Instagram users were chosen from the criteria as a primary data source for the research. Alternatively, hundreds of Instagram users were scoured, however only nine match the criteria snugly.

The next step is to determine the standards of sense of place, extending the process of place formation from just experience. Back to the research's primary purpose, which is to generate or formulate a new method in reviewing information from Instagram photos, we tried to develop our criteria in assessing each of the photographs from the previous space theories (Figure 3).

Experience in space spent the time to create an experience is also to start a movement, and last, the experience is stored in our cognitive ability is adding our previous one. So, in all to form a place and its sense, a person has to understand the change of time in that place, the activity happened and possible to happen in that place and to keep aligning their new experience and knowledge of that place with what they would have before from either the same place or a different one. Past knowledge and experience could also be a norm or regulation applied to the place.
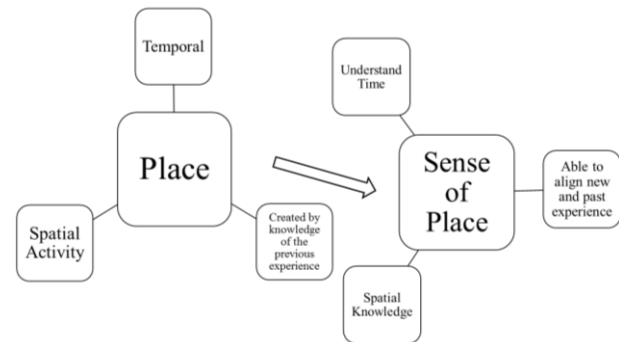
Figure 3 Expanding the initial theory of place.

From three of the main standards of sense of place, we also tried to break down these three into seven variables (Figure 4):

1.   The Wholeness of the Place's Forming Components Captured is an assessment of the objects in that place individually. For example, in a café, chair, table, plate.

2.   Overall Unity of the Physical Elements Describing the Function of the Place is the assessor of things that indicate the function of the place following the plan. For example, in a café, a group of dining tables with its room decorations.

3.   Social Activities, assess what kind of social activities are captured in the picture. For example, in a café, a group of people sitting around a dining table filled with food, or busy waitresses delivering food

4. Preference/satisfaction, assessing what things are seen to be liked by users so that they are underlined in the picture; For example, in a café, a corner or spot that he likes is shown by his volunteering to take pictures of that place.

5. Understanding of the element captured, which is an assessment of the understanding of the elements both physically and socially in that place. For example, in a café, a dining table is a place where users put food on, not to sit on.

6. Sensitivity to time, assessing how he can respond to the relationship between the time and place visited. For example, in a café located in the Upper Dago area with a view of Bandung city at night, visitors will prefer to sit by the window when night falls.

7. Understanding of Overall Functions, evaluating what he understands about the place as a whole. For example, in a café, is how he understands what a café is, what social activities are received while in a café, in what location the café is located.
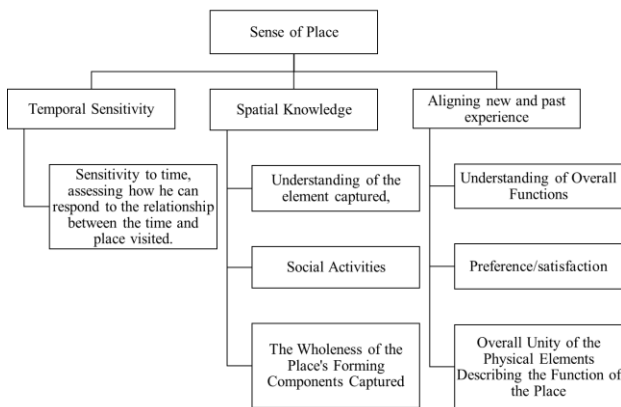

Figure 4 Expanding standards to the variable.

After the data were appraised using the seven variables, we group them based on a similar pattern to see which groups showed lower scores in their sense of place they showed in their photos and how they utilize their Instagram account.

6. DATA RESULT

From around four hundred Instagram user account reviewed, there were nine accounts selected that fit the requirement in the research method, as the main data for this research.

All of their photo uploads are evaluated intensively. Until three or four photos are chosen to represent their pattern. Several people showed two patterns of photos, and each pattern is evaluated differently.

As an example, we will show how the assessment is done in five of the Instagram users. For privacy protection, their face and the full Instagram account will not be shown in this paper.
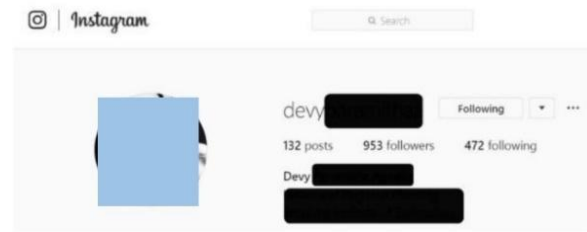
6.1. Devy

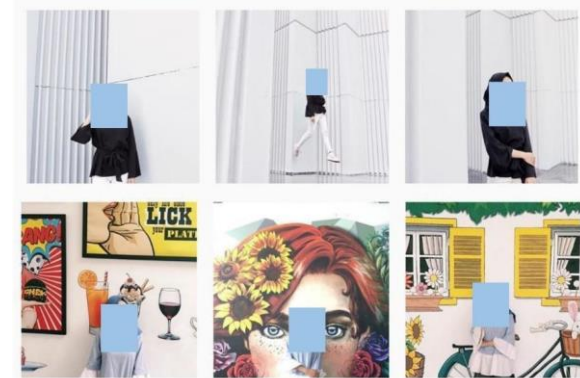**Figure 5** Devy's Instagram profile header. Source: [15]

Figure 6 Devy's Instagram Uploads. Source: [15]

In general, Devy's Instagram profile (Figure 5) pattern is uploading three photos at the same location (Figure 6). In the first three photos, Devy has an awareness of lines and angles as the background of the photo she uploaded on Instagram. She also has an awareness of the monument's ash color of the monument and interacts with those colors by wearing clothes in monochrome colors. But the integrity of the whole monument, also the physical environment, are not shown or captured.

Then in the second row of three photos, the same thing happened. Devy knows the lines, angles, shapes, and colors of various paintings in a cafe that appeals to her to make a background photo she wants to upload on Instagram. Again, some elements are not captured from the paintings, such as the face painting's nose and mouth.

If Devy does not use the geotag feature, people might think that he is in an art gallery, not a modern café in Bandung. This pattern also continues to be repeated in other photos she uploaded on her Instagram profile. So from the above analyses, it can be concluded that Devy can be categorized as an Instagram user who understands the place separately rather than as a whole. She also has little awareness of how knowledge of the place is shared in a digital place.

6.2 Ira

Analysis of Ira's photos shown by Ira on her Instagram profile (Figure 7) shows sensitivity to objects

in its location (Figure 8). The first photo, which is located in an area with the theme of Korea Town in Bandung City. Ira seemed to have realized what will be good for her to catch on camera. The photo also shows her position standing at the center of the objects around her, even if she wasn't in the photo's geometry center. Ira uses various elements that are there to frame herself, thus making her the center of attention.

The same thing was shown in the second photo when she uses a triangular roof-shaped building to make it the center of the photo. The photo also shows the forest around the location.

Figure 7 Ira's Instagram Profile. Source: [15].

Figure 8 Ira's Instagram Uploads. Source: [15].

6.3 Aria

Figure 9 Aria's Instagram profile header. Source: [15].

Figure 10 Aria's Instagram Uploads. Source: [15].

To evaluate Aria's (Figure 9) sense of place from his photographs, first, an understanding of the place he showed in the photograph is needed. His first photo is a photo taken on the Gasibu running track in the middle of Bandung City's hustle (Figure 10). Listing the general thing from a running track would be the track and runners. What would make it obvious to be the Gasibu running track is that the track is surrounded by roads, three main and one sub on the west. The main road is

wide, giving it quite a distance for the building across it to appear on a low shot from Gasibu. However, from Aria's photo, we can see a tall building reaching the blue sky, which means that he takes the picture from the east side of the track to the west side. It then showed the direction of the shadow from the trees and showed the time. Sometime in the morning, when the sun shines from the east, and shadow would be on the west side. Thus criteria of a running track, located in the middle of the city hustle, that showed time are fulfilled.

On the other hand, it only showed his preference for fascinating geometry shapes from a place he visited (Figure 10). Therefore it does not give clear information about the place, but it's not justified that Aria has a low sense of place since he balanced his feed with these two patterns.

Aria's sense of place towards Instagram is a different matter. His number of followers and his intensity in using Instagram to share strongly informed photos about a place showed his high sense of place regarding Instagram. He understood the openness and wide range of information shared on Instagram.

Showing contrast results with Aria, Azwir showed little understanding of the information he shared in his Instagram account, looking from his first photo, taken in Rancaupas camping ground. As usual, to list what exists in a camping ground: tents, campers, and firepit. And those three things are missing from his photo. The other feature that would indicate Rancaupas is that the camping ground is open and wide, and trees only grow near the camping ground's outer boundary, beautiful scenery of hills surrounding the place. However, everything mentioned above is not visible or incomplete.

Thus his photos showed a low sense of place in our reality, and his pattern showed a low sense of place in the digital reality.

6.4 Irfan

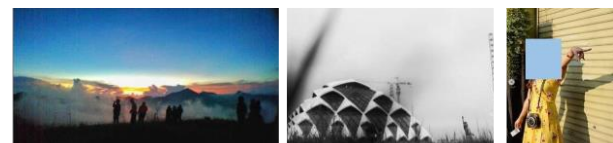**Figure 11** Irfan's Instagram profile header. Source: [15].

Figure 12 Irfan's Instagram profile. Source: [15].

Judging from Irfan's (Figure 11) first photo, it can be seen that he is capturing many elements in the photo. From the photo, we can see a high-altitude area, seen from nearby peaks and clouds (Figure 12). He is also taking the picture from a peak, seen in the absence of green plants other than grass and taken when the sun rose because several people turned their backs to the camera and looked towards where the sun began to rise. It is usually done by the mountain climbers when they are at the cusp of the climb.

In the second photo, he is also seen capturing the conditions of a building (Figure 12). With the crane carrying materials and the surrounding landscape's irregularity. Along with a teenager who was playing near the building. That shows that both the building and the landscape around the building is still under a construction process. However, people can stand near the building and showed that the project fence no longer surrounds the site.

Irfan is often seen capturing elements that make that place in the photos he took looks intact and understandable. But also, he often has another focus when he takes a photo, as in the third photo, which shows a woman and her shadow in front of a closed shop (Figure 12). Although this photo does not depict the place where it was taken, this photo still shows Irfan's sensitivity to the elements around him. He knows if he wanted to capture the woman's shadow, then the background behind her should be light-colored.
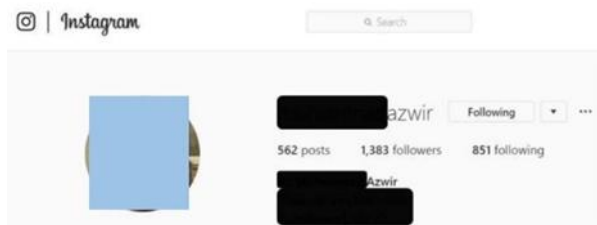
6.5 Azwir

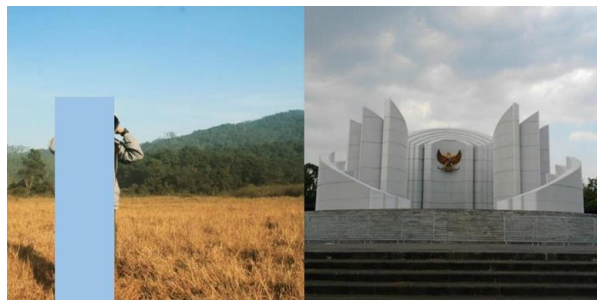**Figure 13** Azwir's Instagram profile header. Source: [15].

Figure 14 Azwir's Instagram Uploads. Source: [15].

Azwir (Figure 13) showed little understanding of the information he shared in his Instagram account, looking

from his first photo, taken in Rancaupas camping ground (Figure 14). As usual, to list what exists in a camping ground: tents, campers, and firepit. And those three things are missing from his photo. The other feature that would indicate Rancaupas is that the camping ground is open and wide, and trees only grow near the camping ground's outer boundary, beautiful scenery of hills surrounding the place. But everything mentioned above is not visible or incomplete.

Thus his photos showed a low sense of place in our reality, and his pattern showed a low sense of place in the digital reality.

6.6 Summary

The same process is applied to the rest of the selected user, resulting in the grouping of data, as we can see in the following tables.

Table 1 Analysis of Selfie Group

No	Username	Selfie						
		X1	X2	X3	X4	X5	X6	X7
1	Devy	x	x	x	√	√	x	x
2	Ira	√	√	√	√	√	x	√
3	Nabilah	x	x	x	x	x	x	x
4	Azwir	x	x	x	x	x	x	x
5	Ayu	x	x	√	√	x	x	x
6	Denis	x	x	x	x	x	x	x

Table 2 Analysis of Non-Selfie Group

No	Username	Non-Selfie Photography						
		X1	X2	X3	X4	X5	X6	X7
1	Ira	√	x	x	√	√	x	x
2	Aria Landscape	√	√	√	√	√	√	√
	Preference	√	x	x	√	√	x	x
3	Irfan Landscape	√	√	√	√	√	√	√
	Preference	√	x	√	√	√	√	√
4	Nabilah	√	x	√	√	x	√	x
5	Azwir	√	x	x	x	x	x	x
6	Rio Preference	√	√	√	x	√	√	√
	Landscape	√	x	√	x	x	x	x

There are two main groupings of users. The first one is selfie photography (Table 1), and the other one is a combination of landscape and preference photography (Table 2). Preference photography focused on several objects instead of the wholeness of the environment. In the analysis results in the selfie group, more photos were uploaded by the resource persons, which showed a lack of understanding of the function of the places indicated in the photos. Then from the results of the

grouping analysis above, it can be further divided into the types of resource persons, namely into categories:

- Visit a place to take a photo and then upload it to each Instagram account

- Visit a place with another primary purpose, and take a photo as just evidence to come to that place.

Then for the analysis in the non-self photo category also showed the same results. Lack of understanding of the function of the place. Furthermore, divided equally:

- Photos were taken to take photos at the venue

- Photos are taken only as evidence when visiting the place.

What can mark that a photo is uploaded and taken only as evidence of visiting the place is the lack of ties the user has with the elements, especially when seen in the elements of user preferences and satisfaction with the place. If they do not like the place, then a photo shows that they have been considered sufficient.

It should be underlined that these variables do not necessarily indicate the condition of the user's sense of place as a whole. However, the sense of place is captured from the photos uploaded in their Instagram profile.

7. CONCLUSIONS AND RECOMMENDATION

This research's primary purpose is to find an irregularity and proof of a different sense of place among Instagram users. Not to further discuss the real result of what is happening when it is different. Further research with a vast amount of data is needed to fulfill a further analysis.

Taking Tuan's theory as the basis of this research, we could see how much movement created space and place. Thus the most basic method to analyze people's sense of place in digital space is to see how much movement they captured and understand. Then Lefebvre could serve as the basis of experience, regulation, and knowledge theory. Then the digital space, the underlying its place like Instagram, is a place that serves as a knowledge-sharing media or information sharing media.

From the evidence obtained after analyzing the case, more Instagram users in this study show a different level

of sense of place to create a representation of space (Figure 15). In a digital space like Instagram, where visual data could be easily accessed and discovered, sharing poor representation or knowledge of space or place could lead to misinformation from people who view the photograph.

"The power to represent the city is no longer concentrated among the elite who control the country and the mass media but is distributed when people use their smartphones to produce and circulate messages that they make themselves." [3]

When the sense of place of Instagram users is high, what is generated by them will affect the image of a location precisely and well. For example, a historical area that is continuously implanted with the interests of history and how the symbolic representation of the region positively impacts city development. When photos spread at locations like this are carried out by people with a high level of sense of place, those who accept and enjoy the photos can also be influenced and understand the area's importance to be preserved.

However, when the level of sense of place of the Instagram users is low when the area is only used as a background for a selfie without having any other meaning, understanding why the place needs to be preserved is also low. If the area is replaced with something far more interesting to be used as a photo background, no one will reject the change. So that changes will often occur. What if this happens not just at one location? That many areas in a city are always changing.

This is where visual data can be beneficial in a study that leads to planning. The visual data shown from this study is that judged by the level of sense of place, more people who use Instagram have a low level of sense of place. This result can be read by translating the narrative from the place where users experience it using the basic theory of space and time.

Note that this research's primary purpose is to find an irregularity and proof of a different sense of place among Instagram users. Not to further discuss the real result of what is happening when it is different. A further research with a vast amount of data is needed to conduct research using this method in depth. This paper could serve as the beginning of new and more in-depth researches regarding digital experience (Instagram) to real-world experience connection.
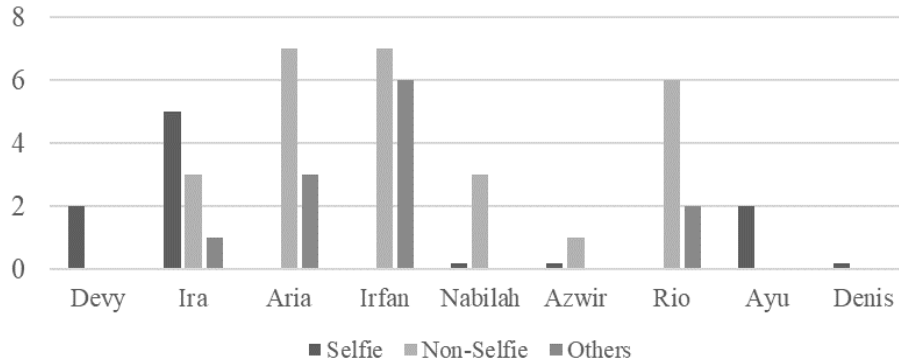
Figure 15 Result of Sense of Place Analysis

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