Abstract
This paper shows the possibility of constructing meaning in mundane places in the city through the mapping of geo-tagged social media content. Over the last decade, the Internet and digital technologies have transformed the way we relate ourselves with identities and places. This phenomenon is proliferated by the merging between social media platform and the geographical information that is enabled by smartphone. The act of sharing voices, activities, or ideas about certain places through social media has become our everyday practice. These voices could reveal the stories of mundane places that play an important role in creating identity in urban context that is hidden within the interconnectivity of its elements so-called topology. The Self-organizing map (SOM) is used to reveal the internal pattern behind the presented elements in the content of geo-tagged social media on particular locations. Therefore, the resulted topological pattern could be seen as the construction of meaning of everyday articulation that is shared among the social media users. The mapping thus shows the shifts on the construction of meaning in the technology-mediated space, described as embedded condition that suggests changes in the current spatial practices.

Keywords: mapping; self-organizing map; everyday; geo-tagged; social media

1. Introduction: Mundane Places in the Technology-Mediated Spaces
The idea of mundanity is often forgotten in architecture and urban discourse. Lynch (1960) suggests that a city should be legible by the presence of particular elements such as landmarks, nodes, districts, paths - all of which has been contributed in making imageability of the city. Those elements mentioned by Lynch has often become the most attractive part, neglecting the fact that a city is a place of everyday life - where everyday practices, which correspond with mundanity, take place every second in it. Mundanity as part of everyday life is often unheard, dominated by the symbolic representation of the City (De Certeau, 1984), as it becomes the ordinary part of life in the city. De Certeau also suggests that ordinary places, where everyday life takes places, possesses pivotal roles in the place making of the city. The construction of meaning in everyday life is more often tied to the way it is practiced, not images that are imposed by the planner.

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However, the mundane slowly surfaces itself in the recent shifts on how we relate ourselves into environment which is enabled by the emergence of the Internet. The shift is particularly proliferated by geo-tagged social media platform as the merging between social media platform and geographical information (Leszczynski 2015) (Thielman 2010). Silverman (2013) argues that the shifted view of exposing everyday practices through social media content differentiates the way people view the capture of everyday life. Each captured fragment could contribute to the meaning of the presented place, and as a whole forms an image, which is perceived by the others. This shifted meaning thereby would had impact on the way we look and design our environment. There are possibilities in revealing the meaning of mundane places by mapping the geo-tagged social media content in respond to the shift. Mapping is finding what is found and unfolding the hidden potential of the objects of mapping (Corner, 1999). Mapping is a priori - it is independent of particular experience. In the context of milieu, it has the effects of contextualizing of surroundings. Mapping as a way of constructing meaning unfolds what already exists and the substances of hidden forces in the object. It is assumed that the co-presence of the elements within each capture of the content denotes connectivity of those elements. The denoted connectivity thus form topology of the elements that could be mapped to reveal the hidden pattern within.

The aim of this paper is to describe the utilization of SOM in revealing the hidden meaning of mundane places that mediated in geo-tagged social media platform and to identify the possible effect of this mediated-meaning on architecture and urban design practices. As a method of mapping as well as an artificial neural network, self-organizing map (SOM) (Kohonen 1990, 1998) has been known by its capability to project high-dimensional data onto regular low-dimensional space. Thus, it is able to organize the complex statistical relationship into the simple geometric relationships on lower-dimensional representation by preserving its most important topological relationships. This attribute thus makes SOM very useful in abstracting and visualizing a complex and large data collection. It inspired us to utilize it in constructing the meaning of ordinary everyday places by revealing the pattern of topological relationship of elements that are expressed on the geo-tagged Instagram social media contents on particular locations.

2. Constructing the Meaning of the Mundane: Self-Organizing Map of Geo-Tagged Social Media Content

Currently, the Internet has transformed the way we think about body and its relation to identity and place (Buchanan, 2009). It has become another reality that augments our physical world. Instagram as the most popular geo-tagged social media content to date could exemplify this transformation since Instagram allows the user to understand themselves as time and place (Leszczynski, 2015) by creating a geo-tagged post and enable other users to find the post based on its locations. The post thus embodies the meaning of places that are shown by the individual who created it. These posts create a new form of dialogue among actors that make the society becomes more dynamic and fragmented, yet connected (Lin, 2013). The dialogue between individual voices is ordinary yet pervasive. It unravels the hidden narratives that construct the city to life. Mapping these dialogues could reveal the stories of mundane places that play an important role in urban living.
We assumed that the co-presence of elements in each media content denotes a topological relation in which the presented elements are connected to one another as shown in Figure 1. The elements could be anything that are identified in the social media posts. There is a possibility that the actual meaning is hidden in the very structure of its topology since every element are connected in a way as it suggests pattern that could explain its particular articulation in everyday practice yet also suggests a complex relationship between elements thus implies the difficulty in visualizing the graph directly. We need an instrumental approach in visualizing those elements in such a meaningful way to reveal its topological pattern. In this context, the self-organizing map (SOM) provides an effective approach in ordering the complex high-dimensional data while maintaining its topological structure. SOM has been used in many applications in creating meaningful representation from large amount of data that is mostly generated from digital media such as website and social media. Sbodio and Simpson (2009) used SOM in clustering tags of bookmarks from large collection of resources intuitively. The use of SOM enable us to organize that lack of explicit semantics data such as tags into optimal number of cluster that easier to understand. The advantage of SOM in classifying and clustering data is that itself produce a graphical presentation that represent the related data near to one another from which we can convey more information than the resulted classification.

The SOM automatically creates a structured representation of high-dimensional data by recursively learn from its given input and then form a meaningful order in which the more similar data would be placed closer than the less ones (Kohonen 1998). The SOM is a simple neural network that are composed by output nodes and input nodes (Stefanovič, 2011). The output layer represents the plane of projection where the projected data would be placed accordingly based on the qualities of the connection between input with output nodes so-called weight. Different weight configuration in the connection between the input and output nodes would determine which node would be triggered for particular input value. By adjusting the weight of each connection, the SOM would create a meaningful plane of projection in the way that different inputs would trigger different node in particular order. The adjustment of the weight of the connections between input and output nodes is conducted in the process called competitive learning (Kohonen 1990). Competitive learning means each input would compete for their optimal places on the output nodes. The resulted configuration thus would solely depend on the value of the input data. The indeterminate nature of SOM thereby provides an appropriate way to reveal a hidden order within arbitrary set of data therefore could be used to reveal the internal meaning of topological relation between elements that are represented in the analyzed media contents.
3. Mapping of the Ordinary: Meaning of Convenience Store in Jakarta

This study looks into the convenience stores as a part of everyday life of Jakarta, the capital city of Indonesia. Convenience store becomes an urban mundane setting where some fragments of the everyday could take place in some ways. Figure 2 illustrates the common situations of convenience store in Jakarta. It is ordinary and unremarkable in presenting the fragments of mundanity in everyday life. People go in and out of the store, shopping, chatting, resting, taking selfie and wefie, working with their laptops, using wi-fi, playing with their phones, or simply stopping by to buy drinks and small bites before continuing their journey elsewhere. In this mapping, we collect one hundred and fifty Instagram posts that are tagged on the three settings of convenience stores in Jakarta. We attempt to map the pattern of the co-presence of elements that are illustrated on the posts of each tagged location in order to explore the hidden meaning behind its contour of mundanity.

![Fig 2. Convenience Stores in Jakarta](image)

The mapping begins by constructing a graph from the collected data on three locations of convenience stores in Jakarta by identifying the captured elements on every picture. All the identified elements would form a set of topological value in which each set of value describe how each elements are connected one into another. Ever elements thus is used to train the self-organizing map. Once the map is trained, the weights of the connections between input and output nodes would be configured in such a way which each element would be placed accordingly based on its topological value. Despite the fact that the position of each presented elements on the map is the order in which the neighboring elements indicates the similarities on its topological value, it is hard to determine the degree of differences between them solely based on their positions. In order to improve the visualization of SOM, a unified distance matrix (u-matrix) is used to represent the degree of differences between one node to its neighboring nodes by create a color index presentation for each node (Stefanovič, 2011). The color index thus represents how far one node differs from its closest neighbor therefore provide us more informative visualization.

Figure 3 shows the mapping results of the three analyzed convenience stores. The words and circles represent every element that are already mapped accordingly based on its SOM training result. The size of the texts and circles indicate the number of appearance which represents the degree of popularity within the social media contents. The background of visualization is formed by the u-matrix of its nodes, showing the degree of differences on its neighboring elements. The darker the cell, the less similar the topological pattern to its neighbor it denotes. The lines represent the connectivity among elements while the thickness of the lines denotes the strength of these relations thus telling us the qualitative information on the number of its co-presences. The resulting visualization thus, could be seen as a qualitative mapping instrument of topological pattern of the elements that are identified in the social media contents. Based on the degree of popularity, connectivity and its topological pattern, the results of this mapping provide us some insight of how every element could construct the meaning of the place.

Based on the three analyzed stores, the elements that directly belong to the store itself such as “store setting”, “store identity”, “food”, “beverages” and “cigarettes” shows some popularity and strong connectivity.
Those elements represent the main meaning of the stores that is already designated. Those elements have a very strong existence, in terms of occurrence and connectivity. While the dominance of those elements is not surprising, the maps also show that these elements form anchors for the other meanings that are yet to be explained.

The map shows more elements that are not normally associated to the convenience store, which could represent the meaning that goes beyond its predetermined meaning. The *fuzzy* integration of "wefie"; and the act of self-taking picture together in a group and "self-portrait" among the other store-related elements such as "cigarette", "snacks", "hot beverage", "mineral water", and "phones" could indicate the uses of the stores as a social gathering place that is beyond its normal utilization. The less dominant elements also suggest the different articulation, however small, on the use of the convenience store. For example, the occurrence of "motorbikes" along with the other elements such as "soda", "snacks", "coffee", "chips", and "group portrait" could indicate specific social group such as the group of motorbike club that uses the store as its place to gather or rest. The occurrence of "motorbikes" on the convenience store III is a bit different; its small number of occurrence and less connectivity suggest that the motorbikes only appear as the background of the image rather than as a significant signifier of meaning. The convenient stores are transformed into places for social gathering, doing things on laptop, or even celebrating a birthday. The described pattern thereby could represent the embedded meanings of the store, which is connected to the existence of the store yet strongly affected by its very everyday practice.

The existence of layers of meaning could provide an insight on how the meaning of the stores as mundane places could be articulated. The prominence of the main identity of the three convenience stores indicates
that it still holds an important role on the construction of the meaning of places. However, the embedded meaning that is much more affected by the everyday practice of the stores suggest the more diverse articulation which extends beyond the singular identity of the store. While conventionally the identity of architecture could be perceived through a single symbolic image as suggested by Venturi (1977), the fragmented reality of the technology-mediated space suggests the more dispersal images of architecture. The main identity however, takes role as precursor of the embedded meanings that follow. The identity of the store is followed by every other element that suggest more variety in articulating its existence. These embedded meaning thus, hold important roles in providing the stores with the more meaningful articulation that indicates that the legibility of the city could not solely depends on particular major elements as suggested by Lynch but rather, as manifestation of everyday practices of the place.

4. Conclusion: Toward the Fragmented Image of Architecture

The emergence of technology-mediated space and its integration in everyday life have shift the way we are perceiving and communicating our spatial environments. The use of Self Organizing Map (SOM) enable us to map the topological patterns that exist on the media surface in understanding the mundanity of architecture and urban context. The described mapping process in this study shows how the geo-tagged social media contents could be analyzed by utilizing SOM and then create a meaningful representation of everyday elements in order to articulate the urban context. The mapping suggests that there are changes in the perception of the images on our environment, specifically in the images of architecture, which tend to be conventionally seen as stable, symbolic and singular, but now become inevitably fragmented into pieces of information. The mapping also indicates the degree of convergence between those elements, which suggests that the embedded meaning is somewhat dynamic yet affected by everyday articulation that is resulted by enabled connections among various perspectives in the social media platform. These changes thereby need to be reflected in our urban spatial practices in order to cope with the current shift. The non-singular view of places indicates the need to reconsider the approach of our design practice, in which the more sensible approach is needed to acknowledge the dynamic nature of the meaning construction in the technology-mediated spaces.

References