

Mapping: A Speculative and Creative Design Tool

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Received: April 27, 2015 | Revised: May 15, 2015 | Accepted: May 25, 2015

Published online: July 15, 2015

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Abstract Mapping is a technique used to record and represent information graphically. In the studios made for architecture and landscape architecture, mapping is usually conducted at the Inventory-making and Analysis stage. Data from the site is gathered and documented for further investigation. However, mapping can also become a creative tool to 'reveal' certain things or invisible processes. It can encourage the designers to speculate the site and the design from different perspectives and at multiple scales. This paper discusses some mapping projects that have been explored by the authors through their research projects. The aim of this paper is to recommend mapping as a creative and speculative design tool that can make data more engaging to design thinking.

Keywords: Mapping; Design; Design Research; Architecture; Landscape Architecture

1. INTRODUCTION

Maps are utilitarian in nature. The use of maps as graphical documentation for recording a setting date back to the prehistoric periods and the early civilizations (Harmon, 2004). Maps normally convey information about a geographical location or about other places, to aid the understanding of space and physical phenomena (Harmon & Clemans, 2009; Pillai, 2013). In the built environment, mapping is employed as a method to record spatial data that can reveal certain patterns or distributions of a subject. Within the last fifteen to twenty years, several designers, planners and artists have challenged the conventions of mapping just as data representation and have explored its usefulness as part of a critical thinking process. In *The Agency of Mapping*, Corner (2011) argues that mapping should reveal something new, rather than as an 'unimaginative, analytical practice'. Bustamante (2008) debates a similar idea, where he asserts that 'the making of a map has to offer critical interpretation and serve as stimuli for the production of new scenarios.' Mapping, like designing, also should act as a way of operating.

Creative Space
Vol. 3, No. 1,
July 2015
pp. 1–12

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The application of mapping as a method of inquiry in the field of design and the built environment is not new. Various designers, artists, scholars and the researchers have implemented mapping as an alternative method to interrogate a site. However, the techniques of mapping have evolved over the years. A combination of creative representations of mapping generates a different kind of interrogation. Rather than merely a display of generic data, mapping becomes a design process in its nature, which can stimulate design thinking.

This article draws on three examples of mapping techniques applicable to the Built Environment Studios (Architecture, Landscape Architecture, Urban Design, Planning). These techniques are ‘Observing’, ‘Following’, and ‘Representing’. A literature review of mapping and the types of mapping are examined to give an overview of the subject matter and address their values in the design field. This article starts by situating mapping as a speculative method of inquiry for aiding the design process. The consequent sub-sections explain three techniques of mapping: Observing, Following, and Representing. The final section concludes the implication of the mapping techniques in architecture education and design thinking.

2. MAPPING

The design field, in the context of the built environment, is a combination of art and science. In architectural research, studies of spaces, the environment and human behaviour can be examined from many aspects. Researchers can examine a subject matter through the lens of social science, technology and construction, law and policy, scientific experiment, or using a multi-method approach. According to Zeisel (1984), the use of ‘multiple techniques’ can allow the researcher to see specific problems that occur between the users and space they occupy. Similarly, Groat and Wang (2013) suggest that the use of ‘multiple tactics’ through employing a range of techniques can provide a wider understanding of certain subjects. Mapping is one of the techniques that design researchers and students can use not only to graphically represent observations, but also to expose specific phenomena through visually documenting specific data.

Mapping is a technique of recording and representing information graphically with a spatial relationship. According to Pillai (2013), humans often seek to understand the relationship between themselves and their surrounding environment. They do this by recording the physical phenomena, territories, spaces, movements and even their metaphoric interpretation of space and time. Caquard and Cartwright (2014) allude to the notion that maps provide more than just geographic information about space. Maps can provide ‘clues’ of what

the cartographer wanted to depict about the place, such as through annotations, adornments and symbolisation. The depiction of the tangible and intangible characteristics of a place through a map can also give its readers a better sense of the place. According to Crawhall (2003), “cultural maps may also make the invisible (knowledge, people, history and heritage) become visible” (as cited in Pillai, 2013, p. 17). The intangible attributes or qualities of a place are not something that is fixed or physical. Fleeting moments and processes often occur as part of the physical environment, yet they may be temporal and not static. Based on this idea, we can infer that there is a bias that exists in the process of mapping. The person who maps, ‘chooses’ what to map. The map will reveal only ‘certain’ things.

In the Built Environment Design Practice, mapping is usually conducted through a site inventory, prior to the design stage. A common practice in doing a site inventory is through documenting a site’s characteristics that are visible or known (Booth, 1983; Simonds & Starke, 2006). An inventory plan on a greater scale may map transportation networks, infrastructures and the different types of land use. Prominent landscape planners like Frederick Steiner (1991) and Ian McHarg (1992) evaluated regions through an overlay of data maps to analyse the site potentials. However, it may be difficult to reveal the relationship and connectivity that a site has with other places through the cadastral maps. For example, in a study on an Indian bazaar, da Cunha and Mathur (2009) discuss the challenge of mapping such a complex place. The bazaar must be experienced through its ephemeral and elastic qualities, and a conventional site inventory and analysis technique may not be sufficient to expose these qualities. In another of their studies, they employed a ‘photo walk’ as a technique of mapping. They construct sections using the photos, rather than from the plan, as they wanted their drawings to convey ‘multiplicity’ through maps, sections and photos all at once. Their mapping work suggest that sites should be allowed to be suspended outwards, creating connections and links to other places, rather than being contained.

The relationship between people and places is significant in studying the built environment. It informs how spaces and elements of the city become meaningful to the people. The use of mapping to understand the user experience in urban design was introduced by Kevin Lynch (1960) in *The Image of the City*. In Lynch’s study, respondents of three cities in the U.S.A. were asked to draw a sketchmap of their city. Their maps were cross-analysed with the maps that the researchers drew from the interview data to establish a correlation (Groat & Wang, 2013; Lynch, 1960). The result of the mapping activity discovered the five similar constructs of a city among all of the respondents: Path, Node, Edge, Landmark and District. Lynch elucidates that, from the maps and the

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differences among the maps, we can also analyse things that have been omitted or distorted. We can further question why certain things are included, and some are not, and how they are represented. As Bustamante (2008) explicates, “the making of a map has to offer critical interpretation and serve as stimuli for the production of new scenarios”. This process is crucial in making the map as a powerful tool to actualise potentials.

2.1 Observing

Observation is a method of collecting data on the patterns of behaviour, movement or change in the built environment. It may mean to look at a certain phenomenon related to a problem (Zeisel, 1984), or to ‘draw a direct evidence’ of what happens (Denscombe, 2007). Researchers can examine the subject of their study in their ‘natural setting’ and record the patterns of behaviour or occurrence in a systematic manner (Collins, 2010; Groat & Wang, 2013). Observation can give indications to how people occupy space, such as where they meet, sit, eat and do other activities. The behavioural patterns can signify how the physical properties of space influence people’s choices about what they do. The patterns of movements and nodes that are recorded over a duration of time can also show the intensity and concentration of activities. As a result, a mapping based on observing behaviours can identify the users’ behavioural domains through physical, cognitive and social interactions with places.

Groat and Wang (2013) describe an example of a research, conducted by Karen Keddy, on the patterns of experience of nursing staff at a hospital. In that study, Keddy employed location-mapping and place-centred behavioural mapping to document her observations and to support other data collection techniques such as interviews, architectural inventories, etc. The mapping revealed ‘hidden’ patterns of activities that the researcher had not initially expected to be in the inventory. In a different study by Golicnik and Ward Thompson (2010), the researchers mapped behavioural observation using GIS as a tool to record how urban residents use urban parks. The spatial annotation and visualisation techniques revealed the relationship between design and use.

We employed the technique of observation and mapping in an Urban Design Project to understand how people occupy a new elevated urban square in Malaysia that has totally replaced a historic open space (Fig. 1). This study was conducted to identify the distribution of activities in the square. We observed the square initially in four time intervals (morning, afternoon, evening and night). We found the similarity of use between the daytime (morning and afternoon) and the night time (evening and night). Hence, the maps were merged into two main maps that would be easier to compare.

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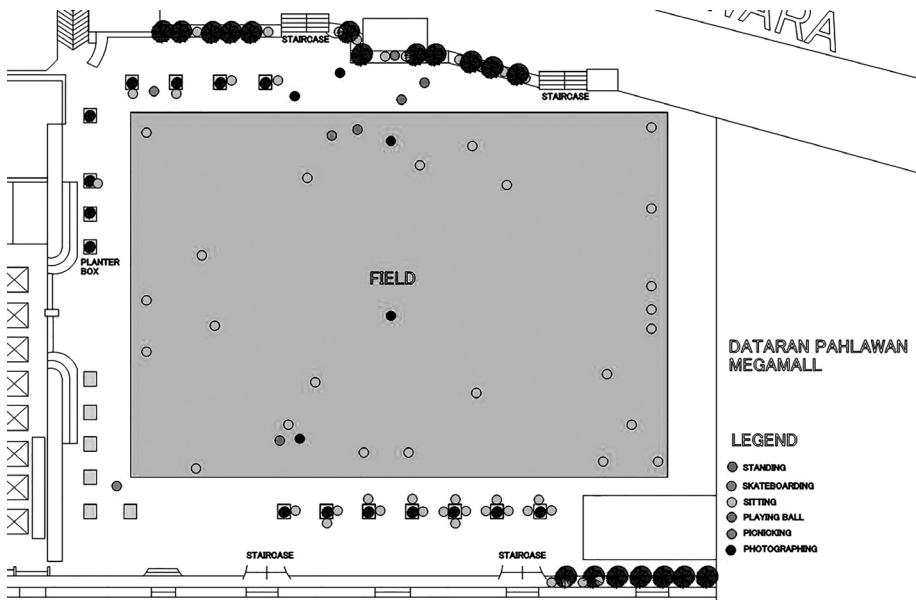
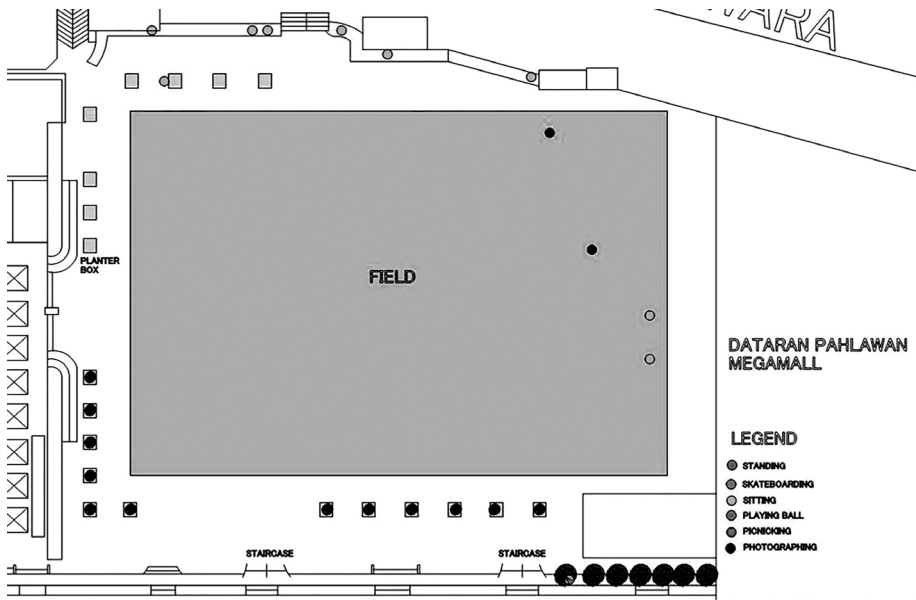


Figure 1: Mapping of activities in the Square: (Above) Morning and afternoon;
(Below) Evening and night (Image Source: Authors)

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Based on the observation mapping, we can see the shift of activities and the intensity of use from daytime to night-time. In the context of Malaysia, we can anticipate that people will tend to use the outdoor spaces in the late evening and at night when it is shady and cool. Nevertheless, the maps give evidence of the variety and distribution of the use spatially, which a survey questionnaire or an interview cannot reveal. The pattern of activities shifts from transitory activities to static activities. Transitory activities happen at the edges of the square, where people pass by and sit briefly. The static activities, such as sitting, picnicking, eating and playing, etc. concentrate in the middle of the square. We were also able to categorise the range of activities that people indulge in. In the daytime, people conducted passive activities such as sitting and taking photographs. At the night-time, they engaged in more active pastimes such as sitting and chatting in groups, skateboarding, strolling and playing ball.

2.2 Following

Mapping the experience of a user is another technique that researchers can use to understand the meaning of a social phenomenon that focuses on ordinary, everyday behaviour (Holloway, Brown & Shipway, 2010). Beyond observing a single spot, walking or 'Following' a user can act as a critical tool to capture the patterns of movements. Careri (2002) describes walking as a medium to look at landscape that allows 'simultaneous reading and writing of space.' Urban activists like 'The Situationist' (Sadler, 1998) and 'The Stalker' (Wiley, 2008) adopted walking as a critical practice to understand cities, places, people and the phenomena of the surroundings. In 1995, The Stalker walked around the peripheries of Rome to learn about the conditions and qualities of these outer city spaces. They followed the paths less studied to uncover other possibilities. In a project by Sue Anne Ware (Zakariya, 2012), the iconic religious symbol in Albuquerque, *Our Lady Guadalupe*, acted as a datum that Ware followed to explore the city. Ware tracked, photographed and mapped the icon as she encountered it in different places. The tracking had led her to discover Albuquerque as 'a very richly textured place.'

'Following', as a way of mapping, can expose the different ways that places are improvised, negotiated and connected. In a project by the Institute of Applied Anatomy, the researchers mapped the routes taken by five people in New York (Mogel & Bhagat, 2010). They juxtaposed the routes that the users chose on a map of CCTV locations in the city. What they found was that the users avoided the routes with CCTVs at different points for specific reasons. In one way, the map exposes the intensity of how the authorities monitor the city. In another way, the map demonstrates how different people negotiate with the systems of surveillance of the city.

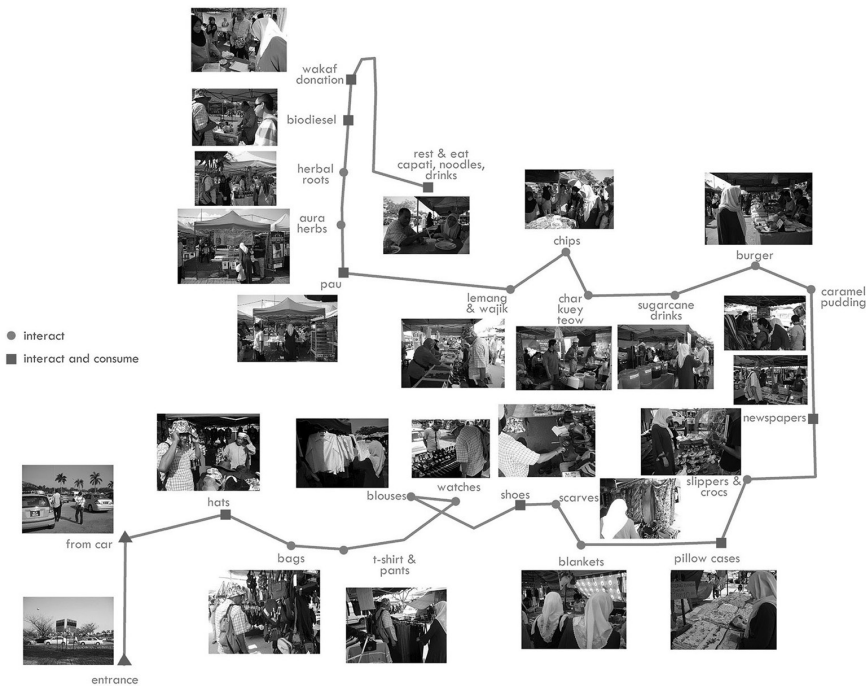


Figure 2: Mapping the experience of a couple of visitors at the Weekend Market.

In 2010, Zakariya (2012) tracked the journey of a couple of visitors to a daytime temporary market in Malaysia. The objective of employing this technique was to identify the activities, spaces and paths involved in the experience of a market. The journey consisted of following the visitors, with their consent, from the point they entered the market, the stalls they visited, until the end of their visit (Fig. 2).

Although we acknowledge that the market experience depends on the visitors' motivations and expectations, the map reveals several important things about the market. The visitor experience consisted of two types which are 'points of interaction with the stalls' and, 'points of interaction and consumption'. Within these two types, there are also 'points of entry and exit', and 'points of resting'. From the points of entry and exit, we can conclude on the role of parking and access as a vital infrastructure in the planning of temporary markets. On the other hand, the flow of visitor experience shows the variations of products and spaces that markets should have, such as merchandise, food and beverage and, services. The organisation of products according to zones

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makes the market more legible to the visitors as they can identify the sections where they want to go to get what they need. The presence of resting points, such as food stalls where visitors can sit and eat, offers another activity to support the visitor's market experience.

The technique of 'Following' as demonstrated in this particular mapping project, enabled the researchers to get an insight into the experience of a user. This experience could not have been gathered from an observation or a survey questionnaire. Becker (1998, p. 16) writes, "If you want to know about society, you have to know about it first hand, and particularly have to know about the places respectable people have little experience of." The act of following becomes a technique of documenting the experiences of users to understand the meaning of a social phenomenon that focuses on ordinary, everyday behaviour (Holloway et al., 2010). We anticipate that more visitor route maps will be able to show a specific pattern of experience, just as Lynch (1960) discovered in his study.

2.3 Representing

In *Envisioning Information*, Tufte (1990) discussed 'micro/macro readings' of maps. Tufte used the 'Manhattan Map' created by Constantine Anderson in 1989 to demonstrate the use of details to give 'personal micro reading'. Anderson's map uses precise axonometric projection drawings through illustrating the city's buildings, subway stations, bus shelters, telephone booths, trees and sidewalk planters. However, the challenge with using a drawing as a map is to demonstrate how things work at shifting scales. Treib (1980) suggests that 'maps are the projection of experience'. Maps function as a tool to communicate spatial relationship.

Representing maps through cartographic drawings, cadastral plans, figure-ground maps, diagrams or other visual techniques can change how the viewer perceives, reads and understands the data. Olafur Eliasson, an artist and a photographer, uses time-lapse photography to document a fleeting phenomenon of light changes in the landscape (Harmon & Clemans, 2009). Eliasson shows the movement of daylight through a collection of photographs to allow viewers to observe how the light changes simultaneously in specific moments and across times. In another example, Emily Martin, a book artist, created an interactive foldout pie from paper to reveal the stories behind each slice (Wasserman, 2007). In this 'Eight Slices of Pie' that readers can unfold piece by piece, Martin shares the different readings of what the pie meant to her. A similar project, called the 'Bon Bon Mots' by Julie Chen, uses concertinas to allow the readers to engage in the act of folding in and out (Wasserman, 2007).



Figure 3: The ‘Nasi Lemak Ingredients Map’.

The combination of these ideas that demonstrate how things operate at a shifting scale as well as the ideas of creative representation techniques drawn from these artists show the potential of how designers might devise maps. In 2009, Zakariya (2012) experimented with the making of maps to show the trajectories of networks and scales involved in the plating of a Malaysian rice dish called *nasi lemak*. In the making of the ‘Nasi Lemak Ingredients Map’, the idea was to understand an object at a greater scale and to test ways to map it (Fig. 3). The rice dish acted as a datum from which the other networks and systems would begin to expand. The map also intended to demonstrate the connection between the local and the global. Before the map making process, the researcher traced the possible origins and routes of the ingredients of the dish and the possible points where they might have been distributed before reaching the plate.

From the fold-out map, the idea of how places are trajectories of global and local processes becomes visible. However, the project revealed more than just an assemblage of places that took part in the plating of a dish. The fold-out ‘Nasi Lemak Ingredients Map’ revealed the systems and scales involved in the networks of putting together the dish. The making of the map was a critical process of design. The interactive nature of the map’s representation allows the reader to see how the journey of each ingredient can occur simultaneously.

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The length of each fold also demonstrates the distance of each journey. Hence, the shifting scales of operation, and the invisible infrastructure and systems can now be visualised. The map also disclosed how a place operates beyond its boundaries. By understanding this, designers can then evaluate where to intervene, and how a proposition might change the operation of the larger system.

CONCLUSION

Mapping plays an important role in revealing what a place has, how it works and how people utilise it. It also opens up possibilities of where and how the designers might intervene. As discussed in the three techniques, mapping can expose the qualities and relationships between people, spaces, services, infrastructure and conditions. The way we represent a map can also offer multiple readings of the place. A multi-method approach to examining spaces in the built environment is critical for designers and researchers. It allows places to be seen with a ‘fresher set of eyes.’ Site inventory and analysis are a common method used by designers and design students to record elements that exist at a site and document how users occupy the site. From the potentials and constraints identified through this process, design becomes a ‘solution’ to the site’s needs. However, to unpack more about the place beyond how it appears, we need to adopt other techniques that can reveal their intangible and invisible characteristics. The mapping techniques discussed in this paper, among others, are extensions of the conventional methods of collecting, representing and examining data. They provide alternative ways for designers and students to see and evaluate space and place.

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