The Image of The City in The Information Era

Analyzing the effect of digital mobile devices on city imaging process

Negar Ahmadpoormobarakeh
Department of Architecture and Built Environment
University of Nottingham
Nottingham, NG7 2RD, United Kingdom
Laxna10@nottingham.ac.uk

Tim Heath
Department of Architecture and Built Environment
University of Nottingham
Nottingham, NG7 2RD, United Kingdom
Tim.Heath@Nottingham.ac.uk

Abstract. This paper presents the early stages of a PhD research which attempts to analyze the effect of using digital mobile devices on the process of city imaging in The Information Era. Within this process, some guidelines are suggested in order to facilitate the design of the physical urban environment as well as the design of technologies with location based systems and navigators.

Keywords: Digital Mobile Devices, Ubiquitous World, Wayfinding, Imageability, Legibility, Mind Mapping, Spatial Configuration, Physical and Digital Guidelines

I. INTRODUCTION

Our society's modalities of communication and hence our cities have been significantly influenced and rapidly changed by the emergence of digital revolutions. In fact, as a result of the recent emergence of the fluid, responsive, kinetic, data-driven worlds of ICT and its combination with urban landscape, urban design faces a radical rethink of a number of its principal underpinnings. So, urban designers need to understand the effect of ICTs and digital mobile devices on traditional urban principals (city imaging, way-finding, context, comprehensibility, space, etc.) together with the way people interact with their physical environment in the Information Era to find ways in which they can fruitfully and desirably combine real urbanity and virtual urbanity. Also, in this way, as a necessity for our mediating cities urban designers can learn how to design a discipline that doesn't really exist yet for the cities; a merger of urban design and urban planning with urban informatics. This would lead to the opportunity for creating networked public space that can value the traditional physical qualities of cities whilst embracing the digital aspects of the developing ubiquitous world.

More than fifty years after the publication of Kevin Lynch's seminal The Image of the Cityi, many architects and urban designers still grapple with the criteria he introduced to evaluate "city imaging" and "good city form". However, the 'city imaging' process has been significantly affected by recent progresses and the presence of a hyper-visual contemporary world. Therefore, it is necessary to rethink the concept of city imaging according to the twenty-first century as Lynch's theories were formed when digital technology did not impact widely on the world. In this light, this paper discusses attempts to analyze the effects of using digital mobile devices on the process of city imaging; imagability, legibility, way-finding.

II. CASE STUDY

This study was undertaken in the city centre of Nottingham, UK and the methodological procedures consisted of mental maps and space syntax (spatial configuration analyses measuring global and local integration values using UCL Depthmap software). As a result, rich qualitative data was collected from two groups of participants during two workshops. One group of participants used mobile phones to carry out self-guided neighborhood tours and the other group explored the neighborhood without using any digital mobile devices [1]. All participants experienced the site for the first time. Then mental maps were collected, evaluated and scored according to the attributes defined for completeness, complexity and accuracyii. The neighborhood was then analyzed using space syntax in order to predict spatial cognition (Fig.1) and the spatial configuration analyses (space syntax) were compared for both groups. Mental maps revealed that those drawn by people using mobile phones to carry out the self-guided neighborhood tours at some points presented streets and landmarks that had the least integration with whole system. In other words, using mobile devices brought out 'hidden parts' of the city in the first level of the cognition process and changed the balance between subjectivity and objectivity in the process of perception (Table1).

Moreover, evaluation of the mental maps for the two groups based on completeness, complexity and accuracy showed that the mental maps generated by the group using mobile phones, presented more details and they were more complex but in a way less accurate than those of the group that experienced the site unaided by technology. The people who used their smart phones could remember many objectives subjectively and draw them in sketches; however, they could not place them

i One of the most important modern contributions to large-scale design theory and it is a detailed study of the way we structure our cities psychologically.

ii Factors were defined for evaluating the mental maps

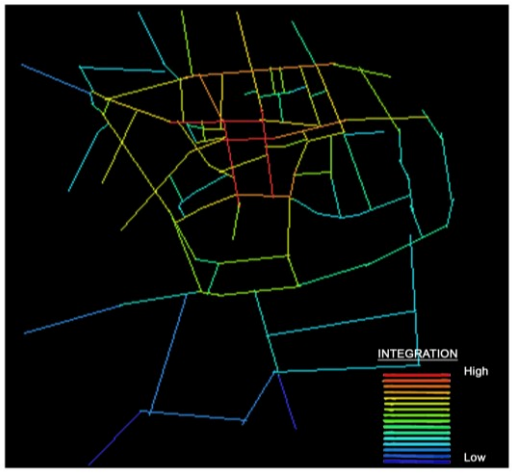

Fig. 1. Integration analysis in Space Syntax(Depth Map)

Table 1: Degree of integration in comparison with the percentage of appearance of each street in the mental maps

ID	Street Name	Integration degree/ Space syntax	appearance in mental maps (%)	
			Non-used phones	Used phones
1	Long Row	1.332	88	78
2	South Parade	1.2048	83	83
3	Bridle Smith	0.9768	58	54
4	Old market square	1.4352	88	88
5	Clumber Street	1.1859	85	86
6	King street	0.7845	62	46
7	Parliament Street	0.8837	72	80
8	Victoria Street	1.3204	68	70
9	Hounds Gate	0.8837	58	65
10	Exchange Walk	1.4062	78	82
11	Friar Lane	1.1187	58	65
12	Wheeler gate	0.7672	0	0
13	Peter's gate	0.757	0	45
14	Gold smith street	0.5635	0	20
15	Milton street	1.0323	0	0
16	Glasshouse street	0.9502	0	0
17	King's Edward street	1.1441	0	45
18	Shakespear e street	0.9443	0	20

accurately and link them correctly. Also, the general orientation and sense of direction were lower amongst this group (Table 2)

Table 2: Evaluation of the mental maps

	complexity		accuracy	
attributes	Accumulative percentage	General Structure	General Orientation	Accurately Placed landmarks
Used phones	5.02	2.2	1.6	6.8
Non-used phone	3.08	1.94	2.3	3.2

The mental maps collected for both groups were scored based on their complexity, and accuracy. Accumulative percentage [2] and General Structure were defined as the attributes of complexity of the maps. Accumulative percentage illuminates the amount of details drawn within the maps (0-100%). General structure shows the general organisation for each map. The score of general structure for each map is ranged from one to five. According to general structure defined for the maps, they are divided into two main categories: sequential and spatial. The maps ranged from sequential to spatial are scored from one to five. Sequential maps which are the simplest type of the maps are (scored one). The maps which are scattered are (scored two), and maps which their components are linked are (scored as three), the pattern incomplete ones are (scored as four), and the maps which their patterns are complete are (scored as five). For the accuracy of the maps, General Orientation and Number of Accurately Placed landmarks are considered as their attributes. General orientation of the maps was scored from one to three: one is considered for the maps which have no orientation, two is for maps with intermediate orientation and three for high orientation maps. The number of accurately placed landmarks was proposed according to the correct location and order for the landmarks.

III. RESULT AND DISCUSSION

Although only a quick pilot study, this research has revealed that tangible legibility is being replaced with intangible legibility through the use of digital mobile devices and location-based services. So, in the Information Era, it appears to matter less if the physical structure of space is not legible and imageable, because digital technology can enhance the physical space and ease wayfinding. However, in using digital devices and services there are some issues to be resolved as people become dependent on those devices. For example, if they

lose their connection to the system, they could have no idea where to go. By using such devices people do not experience the feeling of 'getting lost' in the physical space, however, they might get lost in virtual space. Moreover, many components of the physical place are becoming connected for people by 'digital glue' rather than by 'visual glue'. People are becoming better informed about many locations and places, however they are less able to 'stitch them together' subjectively as well in their minds.

Moreover, some other findings of this study could be related directly to the design of technologies with personalised spatial profiles and location based systems. Firstly, in this study drawing a map from memory could reflect the act of recreating the selective relationships with the local environment for both groups. This could be seen in the inconsistencies present [3] in the mental maps drawn by participants and the way they tried to resolve these during the workshop. Second, for the both groups, participants alongside the physical coordination of elements of the plan, they emphasised on other factors of importance. For example, the reasoning behind inclusion or exclusion of an area from one's neighbourhood, personal reasons for citing (or not citing) a 'landmark', personal memories associated with features in the landscape. Third, in the case of using digital mobile devices for wayfinding, the reflections on making the mental maps were extended into the immediate present. In better words, using digital mobile devices gives people prepared external images with many details. So while participants were drawing the mental maps, they even marked the points and places where they have not been at, but they just saw them in their phones. Therefore, the participant's mode of engagement is shifted from that of a subconscious to a conscious reflective agent [4].

If urban designers accept these devices as tools that can enhance the environment, these spatial profile technologies should be designed in sync with their physical space versions. In view of this our findings suggest series of guidelines to cooperate with facilitating the design of the physical urban environment as well as the design of technologies with location based systems and navigators that can assist people to explore the places.

A. The ability to individually tailor the orientation of spatial displays would seem crucial from a design perspective. Designers of navigation application and similar systems should consider the use of north-up versus track up displays backed up by the spatial mapping literature, but accounting for how a good design could ease distortions in spatial knowledge and enable the development of a good internal representation of different environments [3]. It could appear to matter more where the participants of this study who used their mobile phones to have a self-guided tour, could not link the points accurately in their mental maps and also they showed a lower sense of direction.

B. Flexibility is required for users of spatial technologies to personalise their neighbourhood profiles. Designers of technologies that draw on spatial measurement to define behaviours or services will need to explore the resolution, overlap and spatial mappings that are being used to collect spatial profiles [5]. All location based system technologies ought to be capable to be personalised by users. One of the aim of this study here was to gain perceptions of the environment and to leave people fairly free to express what they felt were key aspects to them in describing their environment. So, while we found a set of traditional landmarks that we might expect to see, we were surprised by the number of landmarks provided with very personal meaning to the participant in both groups. It appears that landmarks can be more quirky, individual and personal in fact less obvious — in a neighbourhood environment.

To some extent, landmark selection is used as a social display of individuality — it conveys the personality of the director's relationship with the neighbourhood to the person being directed. Thus, although a personal landmark may be less easy to immediately identify and share, its eventual identification presents an opportunity to establish a social relationship through a shared understanding of neighbourhood.

C. Designers of spatial services will need to be aware of all types and categories of landmarks in order to make the service authentic. Our data particularly indicates that personal landmarks have a social and communicative role that should not be precluded by enforcing the most legible landmark forms available.

D. Finding the confusing part of the physical space, and enhancing them by a physical installation or digital clue. Finding the confusing part of the physical space as it happened in this study by gathering knowledge on the ways in which people make use of and describe space, could also lead to interventions in real space. As Georg Gartner says'If you know at what point people are likely to make spatial discussions or are likely to get lost, you could place a kiosk there" [6].

This study raises other significant questions like: to what extent should urban designers alongside of traditional way of designing the places, think of using technologies with personalised spatial profiles or applications to enhance the quality of the physical urban environment?

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