

Designing images and episodes of motion to support the user in pervasive, ubiquitous and mobile systems

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Abstract. There are two ideas represented in this paper about urban planning theories that designers of pervasive ubiquitous mobile systems can consider. The first issue is to focus on a design of an image of a whole system and to support the user to piece together the separate elements of the environment. The other issue is turning the attention to a design of episodes of motion in ubiquitous mobile systems, as these episodes are taken into account in urban planning as well.

1 Introduction

Decisions of how to visualize order, structures, and the whole system have been some of the key issues when design practices of urban planning are discussed. The basic idea of all this is to provide a better understanding to the user of the environment in which he/she is moving or standing. One way to achieve this goal is to provide an image of the whole system. But because one understands the image of the whole system only when one is moving in the system, it is important to design different kinds of experiences while the user is moving in a place.

This paper is mainly based on the author's own views and lessons learnt as an architecture, art history and computer science student as well as on experiences as a researcher in a project related to navigation [3] in 3D virtual environments [6] and mobile applications for learners [5].

2 Image of the whole system

One of the most referred to researches of urban planning in the field of human computer interaction and especially in the research of navigation is Kevin Lynch's Image of the City [4]. In his 1960's study Lynch defines landmarks, paths, edges, nodes and districts to be such elements that are essential when the user is creating a cognitive map of his/her surroundings. The user is trying to build up a map in his/her mind by finding the elements from the physical environment and therefore trying to navigate better in the environment.

Supporting the user to create a cognitive map is a complex phenomenon. Creating an image of the city is affected by several things such as the age of the user, his/her social status, life-style and location of the home. For example, the ability to estimate distances could be related to an actual distance between the user's home and the center of the city, or the location of the shopping mall. Previous studies have shown that when the distance between home and the center of the city is getting longer, the user estimate the location of the edge of the center is getting wider. On the other hand, e.g., if a shopping mall is on the way from home to the center, the distance is experienced to be shorter than if a shopping mall is not on the way home [1].

3 Designing episodes of motion

In urban planning some of the well-known designing principles focus on the design of series of places and the user's moving experience in the physical environment. By moving experience, e.g., experiencing a moving from one place to another, the starting and the ending points of the episode are crucial elements which ought to be designed carefully. Furthermore, the implementation of how to represent the continuum between the separate places is also crucial, as well as designing how to lead the user from one episode to another.

Are there any well-designed episodes to be presented to a user in pervasive, ubiquitous mobile systems? There may be, but I assume that if the starting and the ending point of an episode in this sense are defined and based on identifying the user's location, the weak point of ubiquitous mobile systems is representing the continuum between the episodes. By being so, it is difficult for the user to foresee and expect what is going to happen next in a mobile system. In addition, the relationship between the two episodes could be unclear to the user.

Seppo Aura [2, 7] has represented some additional rules for designing *episodes of motion* in urban planning. First, it is important to design routes so that they can be recognized as a part of the whole system. Second, when designing a single episode, some kind of a clue about how the place is going to continue, is relevant. Furthermore, the variation within a single episode will make the episode of motion more interesting. The fourth design rule is related to the rhythm of a place in order to make an episode interesting. Designing the rhythm in a place is related to the gestalt laws as well. The last rule for designing episodes of motion is to design open views and spaces to support the user to visualize spaces better.

As a conclusion, these issues are very interesting to be considered when ubiquitous mobile systems are designed. Providing clues about how the system is going to continue, or designing variation within a single episode could help the user using mobile navigation systems.

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