

Chapter 12

Effect of Urban Computing on the Public's Perception of Place, Community, and Infrastructure

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ABSTRACT

The work presented in this chapter delineates the longitudinal experience of deploying an urban computing system that enables citizens to share and interact with digital content about the urban environment and experiences of people with it. It is part of an emerging and novel aspect of urban computing that expands research beyond simple optimisations of city functions towards a social and cultural approach that seeks to orchestrate complex socio-technical ensembles. Offering Collective City Memory as a service to citizens and enabling them to interact with it via diverse novel interfaces has uncovered the implications for city life that the introduction of urban computing brings such as the redefinition of spatial and temporal proximity and the effects on the perception of city space, fostering of social interactions, contribution to shared resources and participation in collective efforts.

INTRODUCTION

This chapter presents the extensive experience collected while iteratively applying an urban computing system that offers the Collective Memory of a City as a service to its citizens. In social and humanity studies Collective City Memory refers to memories about events that have occurred in a city and are shared within a community, they are thus characterised both by locality and by social contextualisation. It is related to Place as it is mentally anchored to the physical landscape, it is shared in the Community that sustains memories of past events and, as it is a quality that has always been shared in cities, it allows the researcher to evaluate the effect of modern Infrastructure on how people perceive and contribute to

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it. This research has selected Collective City Memory as a research probe that offers a novel perspective upon these core topics of urban computing; namely Place, Community and Infrastructure. The main research questions that thus guided this work sought to understand what is a public space and how urban computing alters the perception that people have of it, what is the people's role in the social sphere in this new era, and how does public infrastructure affect the adoption of novel urban computing services.

A strong motivation to conduct a study in this field has been the fact that urban computing is prominently positioned on the verge between the forefront of UbiComp research, which applies novel technology to people's lives, and the real world allowing the researcher to rapidly explore ideas with real users in authentic settings. The fact that urban computing selects as the setting of research the public space of modern cities where a profoundly wide range of people and cultures meet has also been a strong motive. The effect of its introduction in modern cities, although it has just started to become visible, is expected to be radical, comparable only to earlier ground-breaking technology-led transformations such as the electrification and the introduction of individual's automotive mobility. It has thus been a challenge and a fruitful research opportunity to undertake this work and study how the introduction of technology in modern cities transforms the experience that people live in this sociotechnical ensemble by redefining concepts such as spatial and temporal proximity, perception of city space, contribution and participation.

The cornerstone of the field of urban computing is the introduction of novel information and communications technologies in modern cities. Yet the city space is not neutral, unlike sanitised laboratory environments where research often takes place, city space is always and already populated and in effect culturally organised. The introduction of novel technology to it is an intervention that discloses its qualities and furthers our understanding of it. In this context urban computing research introduces interventions into the city fabric in order to study how people's perception is altered, what social practices may emerge, and even what is the right level or form of an intervention. This work has followed a longitudinal in-situ experimental methodology that exposed a close interconnection between design and research. It has performed the deployment of an experimental probe, the CLIO system, in varied authentic settings with real people. CLIO is a context-aware system able to support a number of applications in the urban environment and to offer access via various devices and interfaces with different capabilities; it invites people to contribute pieces of memory, to identify associations among them, to browse its collection, interact with it by rating or commenting, to explore the city through it and to engage in learning activities. On each deployment iteration an improved design of the probe was introduced that sought to disclose certain qualities of the space and thus allowed the authors to further explore and test a set of research questions.

The interesting results that have come out of this work span all three areas that urban computing focuses on. Through observations and log analysis the effect that a Place, in the sense of both location and character, on the content that users chose to view has been identified. The effect that urban computing applications can have on people's experience with and within the city, as well as the social interactions within the Community that can be spurred, have been demonstrated. Finally, the role of Infrastructure and its effect as different facets to information is discussed, focusing on the roles of mobile and situated gateways as well as whether public and owned devices are disjoint or supplemental.

This chapter is organised as follows; the Background section traces the emergence of the research of urban computing back to the origins of ubiquitous computing and discusses how this new field is differentiated; it also advocates for our selection of Collective City Memory as an appropriate use case to conduct research in this field. The next section presents the system design of CLIO, the research tool

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