HANDBOOK OF RESEARCH ON

URBAN INFORMATICS

THE PRACTICE AND PROMISE OF THE REAL-TIME CITY

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Once a city shaped by the boundary conditions of heavy industrialisation and cheap labour, within a few years Seoul has transformed itself to one of the most connected and creative metropolises in the world, under the influence of a new set of postindustrial prerogatives: consumer choice, instantaneous access to information, and new demands for leisure, luxury, and ecological wholeness. The Korean capital stands out for its spatiotemporally compressed infrastructural development, particularly in the domain of urban informatics. This chapter explores some implications of this compression in relation to Seoulites' strong desire for perpetual connection, a desire that is realised and reproduced through ubiquitous technologies connecting individuals both with one another and with the urban environment itself.

This chapter begins with the premise that ICT can only be considered a meaningful development tool if it is appropriated as ongoing input into the day to day decision-making of the poor. It is at this scale—the local, the individual, the social—that the appropriation of digital technologies is examined. The social appropriation of technology is considered in tandem with the network strategies people employ to manage and access resources. A conceptual bridge between the theoretical foundations of actor-network theory and the more contemporary writings on the African city is constructed to posit a theoretical lens for understanding digital networks in South African cities.

Section II: Participation and Deliberation

Community planning is facing many challenges around the world such as the rapid growth of megacities as well as urban sprawl. The State of Michigan in the United States is attempting to re-invent itself through place making by using participatory planning supported by new information tools, models and online training. The Michigan State University Land Policy Institute framework for place making includes Picture Michigan Tomorrow, an informatics initiative to democratize data and incorporate it into scenario planning methodologies and tools, and Citizen Planner, an on-ground and online training program for local planning officials. Still in the early phases of implementation, these initiatives provide promising models for use in other regions of the world that seek consensus among citizens, developers and government on the vision and plan for their communities.

Section III:
Engagement of Urban Communities

Societies face serious challenges when trying to integrate migrant communities. One-sided solutions do not pay tribute to the complexity of this subject and a single academic discipline provides no proper methodological approaches to the field. An inter-cultural computer club in an urban multi-cultural neighbourhood illustrates these phenomena: appropriate argumentations and models can only be found in a theoretical net of scientific disciplines. Categories in a complex socio-cultural field have to be uncovered. These categories can be explained with the help of the theoretical net. We develop a three-dimensional model combining empirical tools with the research strategy of participatory action research and grounded theory as a guide to theorizing the field. This model is introduced here as a means of socio-technical design and development.

The practical use of information technology devices in domestic and residential contexts often results in radical changes from their envisioned *raison d'être*. This study focuses on the context of household safety and security, and presents results from the analysis of the usage of video cameras in the public areas of an urban neighbourhood in Tecámac, Mexico. Moving beyond the original envisioned purpose of safety, residents of the community engaged in a process of technology appropriation, finding novel applications for the security cameras. These uses included supporting coordination among family members, providing enhanced communication with distant friends and family, looking after minors while playing outside, and showing the household to friends and colleagues. Results illustrate that success in information technologies is a dynamic phenomenon and that technology appropriation has to be understood as a phenomenon that occurs at the level of the application of the device, rather than at the level of the device itself.

This chapter explores how we may design located information and communication technologies (ICTs) to foster community sentiment. It focuses explicitly on possibilities for ICTs to create new modalities of place through exploring key factors such as shared experiences, shared knowledge and shared authorship. To contextualise this discussion in a real world setting, this chapter presents FIGMENTUM, a situated generative art application that was developed for and installed in a new urban development. FIGMENTUM is a non-service based application that aims to trigger emotional and representational place-based communities. Out of this practice-led research comes a theory and a process for designing creative place-based ICT's to animate our urban communities.

This chapter focuses on two projects, Urban Archaeology: Sampling the Park and The Haunting. The phrase voices from beyond is used as a trope in our reflections upon the deployment of mobile media technologies and use of locative media practice to intentionally blur past and present moments. Archival fragments and ghostly images are presented via hand-held devices to use the power, potential and public intimacy of media dependent upon the presence of electromagnetic spectrum. In addition to key texts on locative media, the chapter draws on Benjamin's understanding of history as a sensibility whereby the past and present co-mingle in the minds and embodied memories of human subjects, Darin Barney's notion of the "vanishing table" as an alternative means for engagement in technologically mediated zones of interaction, and writing on communications theory that deals with the spectral qualities of new media.

This chapter defines, explores and exemplifies research at the intersection of people, place and technology in cities. It first theorises the notion of ecology in the social production of space to respond to the quest of making sense of an environment characterised by different stakeholders and actors as well as technical, social and discursive elements that operate across dynamic time and space constraints. Second, it describes and rationalises a research approach which is designed to illuminate, from three different perspectives, the processes at play in the social production of space. The application of this approach is discussed through a case study of community networking and community engagement in an Australian urban renewal site. Three specific interventions that are loosely positioned at the exchange of each perspective are then discussed in detail, namely: Sharing Stories; Social Patchwork and History Lines; and City Flocks.

Section IV:
Location, Navigation and Space

This chapter describes a platform that enables the systematical study of online social networks alongside their real-world counterparts. The system, Cityware, merges users' online social data, made available through Facebook, with mobility traces captured via Bluetooth scanning. Furthermore, the system enables users to contribute their own mobility traces, thus allowing users to form and participate in a community. In addition to describing Cityware's architecture, the chapter discusses the type of data that is being collected, and the analyses the platform enables, as well as users' reactions and thoughts.

In our everyday lives, we are surrounded by information which weaves itself silently into the very fabric of our existence. Much of the time we act in the world based on recognising qualities of information which are relevant to us in the particular situation we are in. These qualities are very often spatial in nature and, in addition to information in the environment itself, we also access representations of space, such as maps and guides. Increasingly, such forms of spatial information are delivered on mobile devices, which enable a different relationship with our spatial world. This chapter discusses an empirical study which attempts to understand how people acquire and act on digital spatial information. In conclusion, it draws on the outcomes of a study to discuss how we might better embed and integrate information in place so that it enables a more relational and shared experience in the interaction between people and their spatial setting.

This chapter proposes that locative urban information necessitates the use of visual instruments, such as maps integrated into spatial annotation systems. The thesis is that the dynamics of the movement and behavior of messages appearing, disappearing, and spreading on the urban maps provide clues as to what extent a specific type of information is dependent on urban space for context, that is, its level of location-sensitivity. A parallel is drawn between the interpretation of dynamic patterns appearing on urban maps and of scientific discovery supported by the use of visual instruments. In order to illustrate how the question of locativity arises when developing technologies for urban life, an examination of BlueSpot, a locative media project in Budapest, is provided.

As cities have become more "computable," capable of manipulation through their digital content, large areas of social life are migrating to the web. This chapter focuses on the virtual city in software, presenting speculations about how such cities are moving beyond the desktop to the point where they are rapidly becoming the desktop itself. But what emerges is a desktop with a difference, a desktop that is part of the web, characterized by a new generation of interactivity between users located at any time in any place. This chapter first outlines the state of the art in virtual city building drawing on the concept of mirror worlds and then comments on the emergence of Web 2.0 and the interactivity that it presumes. It characterizes these developments in terms of virtual cities through the virtual world of Second Life, showing how such worlds are moving to the point where serious scientific content and dialogue is characterizing their use often through the metaphor of the city itself.

Section V:
Wireless and Mobile Culture

This chapter introduces the role of community wireless networks (CWNs) in reconfiguring people, places and information in cities. CWNs are important for leading users and innovators of mobile and wireless technologies in their communities. Their identities are geographically-bounded and their networks that they imbued with social, political and economic values. While there has been much discussion of the networked, virtual and online implications of the Internet, the material implications in physical spaces have been overlooked. By analyzing the work of CWNs in New York and Berlin, this chapter reconceptualizes the interaction between technologies, spaces and forms of organizing. This chapter introduces the concept of codespaces in order to capture the integration of digital information, networks and interfaces with physical space.

From WiFi (802.11b) with its fixed and mobile high-speed wireless broadband Internet connectivity to WiMAX (802.16e), the newest wireless protocol, extending the reach of WiFi across longer distances and more difficult terrain, new wireless technologies are increasingly thought to impact the ways in which we encounter social spaces in public, civic and commercial sites within large urban centers. This chapter explores how and to what extent these new wireless technologies might also be reconfiguring and reorganizing domestic practice and social relations. Drawing on a year-long ethnographic study of WiFi and WiMax provisioned homes in a major Australian metropolitan center, the chapter argues that new wireless infrastructures are impacting how people imagine and use mobile devices, computers and the Internet in and around the home but not in ways wholly anticipated by commercial Internet service providers.

This chapter presents the iSPOTS project, which collects and maps data of WiFi usage on the Massachusetts Institute of Technology campus in Cambridge, Boston. Instead of simply mapping the locations of WiFi availability, the project is possibly the first to use and analyze log files from the Institute's Internet service provider and to produce spatial visualizations of the observed activity in real time. The aim is to create a better understanding of the daily working and living patterns of the MIT academic community, which changes due to the emergence of WiFi itself. The MIT wireless IEEE 802.11 network, which consists of 3,000 access points, one of the largest of its kind, offers a privileged environment for this research and, in perspective, can provide a test bed for entire cities.

This chapter discusses the vision, plan, and status of a research project investigating community-oriented services and applications, comprising a wireless community network, in State College, Pennsylvania, USA. The project specifically investigates new possibilities afforded by location-sensitive and wireless networking access with respect to community engagement and informal learning, as well as broader changes in community attitudes and behaviors associated with the deployment of this new infrastructure.

This chapter presents the findings from a three-year study into mobile phone use in urban culture. The study revealed that for a new generation, the mobile was integral in the formation of fluid social interactions and had accelerated urban mobility. Users once restrained by pre-made plans were able to spontaneously traverse the city and suburbs, swarming between friendship groups and activities. Distinct user archetypes were emerging from these mobile phone driven sub-cultures whose practices were bringing about fundamental changes in social mores with respect to engagement and commitment, to notions of fluid time versus fixed time and ultimately to urban mobility. Recent developments in mobile phone design reveal the potential for a new generation of people to recontextualize their use in a way that moves beyond "the social" as they utilise sensors and data capturing and sharing functionalities in new mobile devices to augment their "social butterfly" identity with an ideology of a "socially conscious urban citizen."

Section VI:
The Not So Distant Future

ing use of the city environment. This chapter discusses the WikiCity Rome project, which was the first occasion for implementing some of WikiCity's elements in a public interface—it was presented on a large screen in a public square in Rome.

Chapter XXVIII

This chapter presents an important new shift in mobile phone usage—from communication tool to "networked mobile personal measurement instrument." It explores how these new "personal instruments" enable an entirely novel and empowering genre of mobile computing usage called citizen science. It investigates how such citizen science can be used collectively across neighborhoods and communities to enable individuals to become active participants and stakeholders as they publicly collect, share, and remix measurements of their city that matter most to them. It further demonstrates the impact of this new participatory urbanism by detailing its usage within the scope of environmental awareness. Inspired by a series of field studies, user driven environmental measurements, and interviews, the chapter present the design of a working hardware system that integrates air quality sensing into an existing mobile phone and exposes the citizen authored measurements to the community—empowering people to become true change agents.

Chapter XXIX

What happens to urban space given a hypothetical future where all information loses its body, that is, when it is offloaded from the material substrate of the physical city to the personal, portable, or ambient displays of tomorrow's urban information systems? This chapter explores the spatial, technological and social implications of an extreme urban informatics regime. It investigates the total virtualization of the marks, signage, signaling and display systems by which we locate, orient ourselves, and navigate through the city. Taking as a vehicle a series of digitally manipulated photographs of specific locations in New York, this study analyzes the environmental impact of a pervasive evacuation of information—at various sites and scales—from the sidewalks, buildings, streets, intersections, infrastructures and public spaces of a fictional future De-saturated City.

Afterword