

# Chapter 14

## User–Centric Social Interaction for Digital Cities

**Kåre Synnes**

*Luleå University of Technology, Sweden*

**Juwel Rana**

*Luleå University of Technology, Sweden*

**Matthias Kranz**

*University of Passau, Germany*

**Olov Schelén**

*Luleå University of Technology, Sweden*

### ABSTRACT

*Pervasive computing was envisioned by pioneers like Mark Weiser but has yet to become an everyday technology in our society. The recent advances regarding Internet of Things, social computing, and mobile access technologies converge to make pervasive computing truly ubiquitous. The key challenge is to make simple and robust solutions for normal users, which shifts the focus from complex platforms involving machine learning and artificial intelligence to more hands on construction of services that are tailored or personalized for individual users. This chapter discusses Internet of Things together with Social Computing as a basis for components that users in a “digital city” could utilize to make their daily life better, safer, etc. A novel environment for user-created services, such as social apps, is presented as a possible solution for this. The vision is that anyone could make a simple service based on Internet-enabled devices (Internet of Things) and encapsulated digital resources such as Open Data, which also can have social aspects embedded. This chapter also aims to identify trends, challenges, and recommendations in regard of Social Interaction for Digital Cities. This work will help expose future themes with high innovation and business potential based on a timeframe roughly 15 years ahead of now. The purpose is to create a common outlook on the future of Information and Communication Technologies (ICT) based on the extrapolation of current trends and ongoing research efforts.*

### 1. INTRODUCTION

By the end of 2008 a milestone was reached, there was now more people living in the cities than outside. This has of course affected and will even more affect people’s life in the future.

A higher density of people creates its challenges, problems and needs.

Today’s society and economy is totally depending on a working and always accessible Internet 24/7. This fact changes and creates opportunities among people in cities and elsewhere. In the cities

DOI: 10.4018/978-1-4666-4695-7.ch014

there is a high density of almost everything and therefore the need of services is special - citizen centric services.

Early 2010 the topic Smart Cities was not very much known in the research community of Future Internet (FI). So far FI had focused on the next generation Internet, building large-scale test-beds, having in mind that this is a 30 year old design. Visions like 50 billion connected devices by the year 2020 (Ericsson), Internet of things creates new opportunities.

The last ten years another topic called Living Labs, sometimes also described as open user driven innovation, entered the European research scene. Methods, tools and processes have been developed in how to involve users as co-creators and this in parallel to FI research. Today there are tools ready to be used involving end users, many end users, to participate in the development of new services and products as co-creators. Not in the end of the product development cycle but early, for, with and by, the users of the new services/products. These new services can be developed by the end-users in the cities (citizens).

Up to now many services that already from the start didn't attract a huge amount of potential customer was never created. Phenomena like the entry of the iPhones and Android mobile phones completely changed the game plan in the telecom world. Services for a very small group of users was possible to develop to a small cost and by the users of their own. Still though, you have to be a rather skilled 'programmer' to create a mobile 'app' or service so the challenge today is to lower the threshold, the barriers of becoming a 'programmer'.

By providing the users, the citizens with tools in order to make their own mobile services the expectation is booming regarding potential new needs to be solved by citizens developing their own services. Internet of things, 50 billion connected devices, open and accessible public data, both from static servers in the city but also by dynamic sensor data in the street will create a

totally new scenario about a more intelligent use of smart technology creating a better quality of life and entrepreneurship in cities.

One definition of a Smart City is 'We believe a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communications infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance' (Caragliu et al, 2009).

The trend is to allow anybody to become a developer of services, even for a small target group usually not in focus by telecom operators and thereby contribute to a better society in many aspects, step by step. Smart Cities is very close to the thematic research area of Digital Cities and the importance of citizen centric services can not enough be seen as a strong driver of new services, products and companies but to reach full effect, there is also a need to lower the threshold, provide the tools, and utilize peoples creativity and the cities advantage as a multicultural melting pot driving societal changes will reach its full potential.

This book discusses the creation of personal, social, and urban awareness through pervasive computing. Although pervasive computing services are foreseen as potentially revolutionary, there is yet little adaption in industry. This paradox is similar to the predicted potential of artificial intelligence and later machine learning, which are successfully applied within a few applications, but which are not generally adopted. Though, this topic recently received again a lot of attention within the context of embodied AI, that is AI within technical systems. The reason for the lack of real-world adoption of pervasive computing for social interaction is potentially due to the inherit complexity of such systems that needs to span both heterogeneous networks and organizations. There are also inherent usability problems in pervasive systems (Drugge et al, 2004). How can then pervasive computing succeed better? The authors of this chapter believe that there are clear

27 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/user-centric-social-interaction-for-digital-cities/88822](http://www.igi-global.com/chapter/user-centric-social-interaction-for-digital-cities/88822)

## Related Content

---

### Model-Driven Development for Pervasive Information Systems

José Eduardo Fernandes, Ricardo J. Machado and João Álvaro Carvalho (2010). *Ubiquitous and Pervasive Computing: Concepts, Methodologies, Tools, and Applications* (pp. 408-438).

[www.irma-international.org/chapter/model-driven-development-pervasive-information/37799](http://www.irma-international.org/chapter/model-driven-development-pervasive-information/37799)

### Adaptive Resource and Service Management in a Mobile-Enabled Environment

Claudia Raibulet (2010). *Ubiquitous and Pervasive Computing: Concepts, Methodologies, Tools, and Applications* (pp. 1527-1548).

[www.irma-international.org/chapter/adaptive-resource-service-management-mobile/37866](http://www.irma-international.org/chapter/adaptive-resource-service-management-mobile/37866)

### Pervasive Computing Applications, Technologies, and Challenges for E-Health

Thienne Johnson, Eleri Cardozo and Eliane Gomes Guimarães (2010). *Designing Solutions-Based Ubiquitous and Pervasive Computing: New Issues and Trends* (pp. 232-247).

[www.irma-international.org/chapter/pervasive-computing-applications-technologies-challenges/42512](http://www.irma-international.org/chapter/pervasive-computing-applications-technologies-challenges/42512)

### The Information Construction of Wind Farm Based on SIS System

Yao Wan-Ye and Yin Shi (2011). *International Journal of Advanced Pervasive and Ubiquitous Computing* (pp. 59-66).

[www.irma-international.org/article/information-construction-wind-farm-based/62297](http://www.irma-international.org/article/information-construction-wind-farm-based/62297)

### Modelling and Performance Studies of ATM Networks Over Email & FTP

Nurul I. Sarkar and Kashif Nisar (2012). *International Journal of Advanced Pervasive and Ubiquitous Computing* (pp. 16-25).

[www.irma-international.org/article/modelling-performance-studies-atm-networks/71882](http://www.irma-international.org/article/modelling-performance-studies-atm-networks/71882)