
IGI PUBLISHING **ITB15286**
701 E. Chocolate Avenue, Suite 200, Hershey PA 17033-1240, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.igi-global.com

This paper appears in the publication, **Advances in Ubiquitous Computing: Future Paradigms and Directions** edited by S. Mostefaoui, Z. Maamar, and G. Giaglis © 2008, IGI Global

Chapter X

Towards Ambient Business: Enabling Open Innovation in a World of Ubiquitous Computing

Christian Schmitt, University of Cologne, Germany

Detlef Schoder, University of Cologne, Germany

Kai Fischbach, University of Cologne, Germany

Steffen Muhle, University of Cologne, Germany

Abstract

Ubiquitous computing enables the development of new innovative applications and services. Particularly influential on future business services will be the connection of the real with the virtual world by embedding computers or smallest processors, memory chips, and sensors into the environment and into physical objects, as well as using natural, multimodal customer interaction. Bearing in mind that ubiquitous computing entails the interaction of mobile smart objects and local smart environments hosted by different service providers, we propose an open approach to encourage the development of new and innovative smart applications and services. Considering the Open Source community, we assert that such an open approach reveals innovation potentials that cannot be achieved in proprietary information

system environments. Most research projects, as well as commercial initiatives, however, focus mainly on specific, proprietary applications like smart shopping environments, and do not incorporate further prospects of using an open approach. Therefore, this chapter discusses as a first step the impact of Open Innovation in a world of ubiquitous computing from an economic perspective. Then, the design of an Open Object Information Infrastructure (OOII) that enables Open Innovation in the context of ubiquitous computing is presented. Finally, an innovative smart service called the Federative Library (FedLib), which represents a first instantiation of the OOII, is introduced to demonstrate the feasibility of the design.

Introduction

The connection of the real and the virtual world encourages the development of new and innovative applications and services. Google is a prominent case which distinctly underlines the creative power of combining both worlds (Roush, 2005). In June of 2005, Google released an official API for Google Maps and Google Earth. Through this, consumers and external developers now have access to detailed aerial and satellite maps and advanced geographical visualization tools that can easily be used to display data atop the Google maps. Almost immediately, a community of "geotagging" map makers was formed that ties information on the Web to geographical coordinates in order to build geospatial applications (examples of so-called "map mash-ups" can be found in Gibson, 2006). Geotagging means amplifying physical places with information so that, for instance, users of mobile devices with location technologies can retrieve additional information related to their current locations. This includes location-based ads and listings for nearby shopping, dining, entertainment, and business outlets or even photographs, videos, stories, and other personal information uploaded to the Internet and pinned to specific latitudes and longitudes. As a result, the community participates in the innovation process and in building "a browser for the earth," as John Hanke, general manager of Google's Keyhole Group, describes Google Earth (Roush, 2005). This could enable a new and natural means of accessing location-based information. Wade Roush (2005) describes this vision by drawing a comparison: "Every page on the Web has a location, in the form of a URL. Now every location can have a Web page [...] it means that navigating both the Web and the real geography around us is about to become a much richer experience, rife with occasions for on-the-spot education and commerce. It means that we will be able to browse the Web-and the virtual earth encompassed within it-simply by walking around." (p. 60)

As the Google case also illustrates, opening access to information systems and intellectual property (IP) to complementors, suppliers, users, and even to competitors encourages innovation, increases the attractiveness of platforms, and enriches