

Chapter 40

Ambient E-Service: A Bottom-up Collaborative Business Model

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INTRODUCTION

The e-services have introduced a significant wave of change in communication patterns around the world. Such e-services are capable of intelligent interaction and are able to discover and negotiate with each other, mediate on behalf of their users and reconfigure themselves into services that are more complex.

In this chapter, the author explores the future opportunities and its applications of ambient e-service. Contrast to traditional e-business service delivery method, their proposed service focus on the bottom-up collaborative approach that enables e-business participants to cooperate with nearby users and encourage information sharing and experience co-creation. The notion of ambient e-service is defined to identify a new scope of mobile e-service, which address dynamic collective efforts between

mobile users (enabled by Mobile Peer-to-Peer technology), dynamic interactions with ambient environments (envisioned by Location-Based Service), the moment of value (empowered by wireless technologies), and low cost service provision. Several ambient e-service application scenarios will be introduced in the following sections.

The author will present an ambient e-service framework that characterizes ambient e-services with three dimensions (value stack, environment stack and technology stack). Several ambient e-service applications are also exemplified, which rest on the mobile peer-to-peer technology and ambient context aware sensors environments. Ambient e-service make a ubiquitous e-business user not only connect to dynamic ambient environments but also cooperate with other mobile users in the nearby surrounding environment, capitalizing dynamic environmental values as well as dynamic social values.

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BACKGROUND

Mobile commerce promises to deliver the real potential of Internet for commercial purposes to a significantly expanded market of existing and new users. A four-level integrated mobile commerce framework has been proposed (Varshney & Vetter, 2002), that discusses how to successfully define, construct, and implement the necessary hardware/software infrastructures in support of mobile commerce. Wireless technology and mobile networks make it possible for mobile users to connect to the Internet, and mobile-service applications have become popular. With the appearance and penetration of mobile devices such as notebooks, PDAs, and smart phones, ubiquitous systems are becoming increasingly popular these days.

Examples of mobile commerce applications include: mobile financial applications such as m-banking, m-brokerage services that allow the mobile device to become the financial medium, mobile advertising applications that attempt to transform the wireless environment into a new marketing battlefield, and mobile shopping services. In other words, mobile commerce has ushered in a slew of new opportunities and new applications in e-commerce and e-business. However, the applications reviewed in Varshney & Vetter (2002) were grounded in the client/server architecture where the interactions involved are between a services provider and a mobile user, and did not including possible interactions between the mobile user and the environment or other nearby mobile users.

OVERVIEW OF AMBIENT E-SERVICE

The improved portability and battery life make it possible for mobile users can make use of almost the same range of services as desktop users. Emerging ubiquitous computing that utilizes and integrates pervasive, wireless, embedded, wearable and/or mobile technologies to bridge the

gaps between the digital and physical worlds. Ubiquitous computing envisions a world of fully connected devices, with cheap wireless networks everywhere. The ambient e-services are similar to applications on mobile ad-hoc networks, which are a collection of autonomous peers or terminals that communicate with each other over relatively bandwidth-constrained wireless links. Ambient intelligence is a way of subtly gathering information from an environment and acting on it (Curtis et.al, 2009).

Although mobile commerce grown in a remarkable fashion, most existing mobile services and applications were designed based on client/server architecture. The notion of ambient e-service is defined to identify a new scope of mobile e-services (Hwang & Yuan, 2007). In the foundational mobile commerce framework, mobile users were essentially standalone users due to the lack of technology functions and communication channels that enabled mobile users to interact with each other. Interactions between mobile users were not considered an important issue in mobile service scenarios. Consequently, the collective value generated from a peer group of mobile users (or multiple peer groups) cannot be realized.

Peer-to-Peer (P2P) computing is a networking and distributed computing paradigm which allows the sharing of computing resources and services by direct, symmetric interaction between computers. The latest P2P technology (e.g., JXTA) enables mobile e-services to take the next step. This technology makes it possible for individual mobile peers to communicate with each other and wirelessly exchange information under sensor-enabled environments. Collaborative interactions between mobile users create a new paradigm for mobile telecommunications. This new framework for mobile applications, its dynamic environments, and the collective efforts of mobile users, are deserving of investigation.

P2P computing has increasingly emerged at the forefront of Internet computing. A concept

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