Ubiquitous Commerce

Holtjona Galanxhi-Janaqi
University of Nebraska-Lincoln, USA

Fiona Fui-Hoon Nah
University of Nebraska-Lincoln, USA

UBIQUITOUS COMMERCE: THE NEW WAVE

Ubiquitous commerce, also referred to as u-commerce or übercommerce, is the combination of electronic, wireless-mobile, television, voice, and silent commerce. However, its full realization would bring something more than the simple sum of its components. Ubiquitous commerce can be defined as "the use of ubiquitous networks to support personalized and uninterrupted communications and transactions between a firm and its various stakeholders to provide a level of value, above, and beyond traditional commerce" (Watson, Pitt, Berthon, & Zinkhan, 2002).

CHARACTERISTICS OF UBIQUITOUS COMMERCE

One of the characteristics of u-commerce is ubiquity. It means that computers will be everywhere and every device will be connected to the Internet. It is this omnipresence of computer chips that will make them "invisible" as people will no longer notice them (Watson et al., 2002).

U-commerce will also add universality. Universality will eliminate the problems of incompatibility caused by the lack of standardization like the use of mobile phones in different networks. A universal device will make it possible to stay connected at anyplace and anytime.

U-commerce will add uniqueness of information. Uniqueness means that the information provided to the users will be easily customized to their current context and particular needs in a specific time and place.

Finally, unison aggregates the aspects of application and data into one construct (Junglas & Watson, 2003b). In a u-commerce environment, it is possible to integrate various communication systems such that there is a single interface or connection point to them (Watson et al., 2002).

COMPONENTS OF UBIQUITOUS COMMERCE

Junglas and Watson (2003a) view u-commerce as a conceptual extension of e-commerce and m-commerce (mobile commerce).

Electronic Commerce

Electronic commerce is the use of the Internet and the Web to transact business. There are three main types of e-commerce: business to consumer, business to business, and consumer to consumer. In addition, government-to-government, government-to-consumer, and consumer-to-government e-commerce have emerged. E-commerce is the most established type of commerce performed through digital means. Companies are using it as a part of their traditional commerce or as a pure online business model.

Wireless Commerce

Wireless commerce extends e-commerce with characteristics such as reachability, accessibility, localization, identification, and portability. Wireless commerce is a key part of u-commerce because it creates the possibility for communications between people, businesses, and objects to happen anywhere and anytime. Mobile and wireless devices are enabling organizations to conduct business in more efficient and effective ways (Nah, Siau, & Sheng, 2005). Wireless devices can offer many advantages for

companies and individuals such as empowering the sales force, coordinating remote employees, giving workers mobility, improving customer service, and capturing new markets.

Other components of u-commerce are voice, television, and silent commerce.

Voice Commerce

An increasing number of businesses are using computerized voice technologies: speech recognition, voice identification, and text to speech. Voice commerce enables businesses to reduce call-center operating costs and improve customer service. Voice commerce can also be used to generate new sources of revenue, but this will probably take longer to materialize. Companies are mostly pursuing voice commerce as a part of a multichannel strategy.

Television Commerce

The spread of interactive digital television will provide a platform for two-way personalized communication in the center of most homes. This will make television commerce a big opportunity for business and a critical component of u-commerce. Television commerce is mainly used as an end-consumer channel. Since it can reach a big range of the population, governments may also use it to deliver their services. Digital television is also a suitable method to deliver innovative services. Interacting TV (TiVo) integrates software and set-top boxes to facilitate digital interactive television with many capabilities, including time-shifting content and filtering advertisements.

Silent Commerce

Silent commerce refers to the business opportunities created by making everyday objects intelligent and interactive. For example, radio-frequency identification (RFID) chips allow the tagging, tracking, and monitoring of objects along an organization's supply chain. An important advantage of RFID as compared to technologies like bar codes is its ability to identify and track individual assets while barcodes can only identify classes of assets. Microelectromechanical systems (MEMSs) chips combine the capabilities of an RFID tag with small, embedded mechanical devices such as sensors. Nowadays, researchers are even talking about nanoelectromechanical systems (NEMSs) or structures, which have dimensions below a micron.

With more advanced silent commerce applications, it will be possible for organizations to identify, track, and monitor every single product along the entire supply chain and even after the sale, up to the point when the product is recycled. These more complex solutions could completely transform the businesses of tomorrow and they create a stream of information and value.

THE DRIVERS FOR THE GROWTH OF U-COMMERCE

Schapp and Cornelius (2001) identify three global phenomena that will accelerate the growth of u-commerce.

Pervasiveness of Technology

The explosive growth of nanotechnology and the continuing capital investments in technology at the enterprise level increase the pervasiveness of the technology and expand the platform on which to leverage innovation and new applications. Two of the main barriers are size and power supply. Bluetooth and MEMS technology are examples that can help overcome these barriers in the future.

Growth of Wireless

Wireless is one of the fastest-growing distributed bases: Wireless networks have expanded around the globe, and mobile phone usage and new applications have exploded. Wireless commerce is therefore a critical component of u-commerce. It is critical to resolve the related issues in order to capture the full advantage that u-commerce can offer.

Table 1 provides an overview of the current state of different generations of cellular voice and data services.

Increasing Bandwidth and Connectivity

Bandwidth has been doubling every 9 months, or roughly at twice the growth rate of computing power. Increasing bandwidth will lead to the creation of what

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