

## Chapter XII

# Understanding the Impact of Wireless Local Area Networks on Users and Assessing User Satisfaction with Wireless Local Area Networks

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### **ABSTRACT**

*Recently, wireless local area network (WLAN) has gained increasing popularity. WLAN equipment manufacturers and practitioners claimed that WLAN had brought dramatic improvements in the forms of productivity gains and attainment of convenience, flexibility, mobility, and time saving to organizations and their employees. However, very little academic research has been conducted to verify these claims and further our understanding of this new phenomenon. By surveying end users and managers, this study investigates the impact of WLAN on users and their work. User satisfaction with WLAN is also assessed. This chapter presents the findings from the study along with a discussion on recent development and future trends of WLAN. Finally, recommendations to researchers, managers, WLAN technology providers, and equipment manufacturers are also provided.*

## INTRODUCTION

Growth in nomadic computing is driven by the incessant advances in wireless and mobile technologies and the business need for mobility. Nomadic computing refers to an environment where nomad users have access to computing resources, communication capabilities, and services that are transparent, integrated, convenient, and adaptive (Kleinrock, 2001). Industry experts are predicting a growing trend of a new way of doing business based on wireless and mobile technologies—mobile commerce (m-commerce). While many wireless technologies promise to revolutionize the conduct of business, organizations often fail to make a business case for investing in these technologies (Goldman, 2001; Use tech as a tool, 2002). In addition, the rapid technological innovations in this field have left many IT managers still trying to sort out the different technology platforms and the type of business applications that these technologies would effectively support. Many questions remain to be answered in the area of nomadic computing providing researchers with ample research opportunities as outlined by Lyytinen and Yoo (2002).

It is imperative to understand the business value of nomadic computing. Balasubramanian, Peterson, and Jarvenpaa (2002) suggested that mobile technologies relax spatial and/or temporal constraints of activities. For example, with mobile technologies, a worker in the field can check e-mail at any time. Without the technologies, this activity would be limited by both spatial and temporal constraints (i.e., One can only check e-mail when she is at a location where a computer and a network connection is present). In the same vein, Chen and Nath (2003) proposed a model that helps managers determine the value of mobile and wireless applications. The model stipulates that the value of mobile and wireless applications is a function of the user's immediacy of information needs and user mobility.

Even though a national nomadic information environment (NIE) is somewhat possible by using services provided by various national wireless providers, many small pockets of NIEs have emerged and they continue to grow. Most of these NIEs with limited geographic reach serve employees within the organization's physical boundaries. Open standards such as wireless fidelity (Wi-Fi) and bluetooth allow organizations to develop these NIEs with relative ease and low costs. Data and information can be shared seamlessly between different devices and networks within a limited geographic area. Such NIEs are often referred to as wireless local area networks (WLAN). Many organizations have adopted the IEEE802.11b and IEEE802.11g technology, two of the Wi-Fi standards, to provide wireless access to users within a local geographical area (e.g., a building, campus, airport, coffee shop, and hotel). According to the 2001 NOP World-Technology study (2001), the market penetration of WLAN in the U.S. reached 10% in 2000, and users credited WLAN with attainment of convenience, flexibility, mobility, time saving, and productivity gains. A more recent study conducted as part of the PEW Internet and American Life Project showed that 17% of Internet users have logged on the net using a wireless device such as Internet-connected mobile phones and WiFi-enabled laptops (Rainie, 2004). While IEEE802.11b and IEEE802.11g are the most popular WLAN solutions among U.S. businesses today, newer technology solutions (e.g., IEEE802.11a and IEEE802.11i) are promising higher data speed and enhanced security in the near future (Funk, 2005). There also exists a significant potential for WiFi technology in the consumer market. By 2009, according to Datacomm Research Company, WLAN equipment sales will triple in terms of number of units sold primarily due to their growing use in home entertainment applications (LAN Product News, 2005).

In the case of WLAN, while user mobility is limited to a small geographical area (e.g., an office or a building), it supports a wide range of

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