

Chapter XXI

An Empirical Examination of the Impact of Wireless Local Area Networks on Organization of Users

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EXECUTIVE SUMMARY

In recent years, the concept of nomadic computing has received considerable attention from the business community. As an early form of nomadic information environment (NIE), wireless local area network (WLAN) has gained tremendous popularity with organizations. Using mostly anecdotal evidences, WLAN equipment manufacturers and practitioners claimed that WLAN 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. Finally, recommendations to researchers, managers, WLAN technology providers, and equipment manufacturers also are provided.

INTRODUCTION

Improvements in wireless communication technologies have spawned interest in nomadic computing. Nomadic computing refers to an environment in which nomad users have access to computing resources; communication capabilities; and services that are transparent, integrated, convenient, and adaptive (Kleinrock, 2001). Such an environment offers users unprecedented ca-

pabilities to access and to distribute information, when they are on the move. While consumers are embracing some of the new wireless connectivity technologies, such as WiFi, for their homes, the biggest demand for these capabilities is likely to originate from the business community. Nomadic computing promises to enhance the level of mobility in computing and communication for employees both within and beyond organizational boundaries. Business organizations are quick to take notice of the value created by these capabilities. Key benefits of this unfettered computing include improved employee productivity, quick response to inquiries and requests, and enhanced customer services.

Growth in nomadic computing is driven by incessant advances in wireless and mobile technologies and the business need for mobility. Industry experts are predicting a growing trend toward a new way of doing business based on wireless and mobile technologies—mobile commerce (m-commerce). According to Balasubramanian, Peterson, and Jarvenpaa (2002), m-commerce refers to communicating and conducting business transactions using mobile devices. 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 support effectively. 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, et al. (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 one is at a location where a computer and a network connection are present). In the same vein, Chen and Nath (2004) proposed a model that helps managers to 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 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 among different devices and networks within a limited geographic area. Such NIEs are often referred to as wireless local area networks (WLANs). 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., building, campus, airport, coffee shop, hotel). According to the 2001 NOP World-Technology (2001) study, the market penetration of WLANs 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 to the Internet 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 prom-

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