Chapter XVII

Bringing Secure Wireless Technology to the Bedside:
A Case Study of Two Canadian Healthcare Organizations

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ABSTRACT

Wireless technology has broad implications for the healthcare environment. Despite its promise, this new technology has raised questions about security and privacy of sensitive data that is prevalent in healthcare organizations. All healthcare organizations are governed by legislation and regulations, and the implementation of enterprise applications using new technology is comparatively more difficult than in other industries. Using a configuration-idiographic case-study approach, this study investigated challenges faced by two Canadian healthcare organizations. In addition to interviews with management and staff of the organizations, a walk-through was also conducted to observe and collect first-hand data of the implementation of wireless technology in the clinical environment. In the organizations under examination, it was found that wireless technology is being implemented gradually to augment the wired network. Problems associated with implementing wireless technology in these Canadian organizations are also discussed. Because of different standards in this technology, the two organizations are following different upgrade paths. Based on the data collected, best practices for secure wireless access in these organizations are proposed.
INTRODUCTION

Technology, the Internet, and healthcare reform are converging to change the healthcare environment and create a seamless integrated healthcare network. This seamless network will facilitate the flow of information from multiple sources to multiple healthcare providers, administrators, patients, and other support services 24 hours a day, seven days a week, among multiple sites (Masys & Baker, 1997). Implementing and managing such a network within the healthcare environment poses unique challenges. First, medical and health information is highly sensitive; therefore security and privacy of the information must be a top priority. Security and privacy in healthcare is governed by legislation and regulation. In Manitoba, this means the Personal Health Information Act (PHIA). PHIA specifies how medical information can be accessed, by whom, and for what purposes. It also states the security and privacy regulations for all health information systems used within the province. Second, unlike other industries, medical care is not delivered in the same place even by the same healthcare professional, necessitating the need for multiple access points (APs) for the same information. For example, a physician on rounds moves from one patient to another, each of whom may reside in a different room, necessitating the need for network access in each room to record and receive data and communicate with other needed services such as pharmacy or nursing.

The challenge in creating a seamless network in healthcare is how to provide information to multiple users at the point in which they will require the information to deliver effective patient care. A wireless network may offer the opportunity to meet this challenge and provide significant benefits to the healthcare system. A wireless local area network (WLAN) offers improved accuracy and efficiency for documenting nursing care, decreased preventable medication error through better point-of-care medication-administration systems, an increase in patient satisfaction, and efficiency in admission and discharge and other health administration processes (Sims, 2004). Additional technical benefits include lower costs, less cabling, availability of the network in locations not accessible with a wired connection, and the ability to adapt to growth easier.

The implementation of a WLAN is not without its challenges. Some challenges such as performance, speed, and accessibility are similar to those of a wired network, but others such as limited battery power of the devices, necessitating the need for an electrical source if the device is required for extended use; higher risk of equipment loss; and interference with medical equipment are unique to the WLAN environment (Karygiannis & Owens, 2002). Multiple standards and the fact that a WLAN does not usually replace a wired network but augments it increases the complexity of the management and compatibility of new systems (Drew, 2003). However, security is the biggest challenge facing a healthcare organization contemplating a wireless network. Wireless networks pose an increased risk of eavesdropping, hackers, and rogue devices (Sims, 2004). Securing a WLAN and the perception of its security may be one of the most limiting factors in the widespread use of WLAN in healthcare today (Campbell & Durigon, 2003).

Objectives of the Study

The objectives of this study were the following:

a. To gain an understanding of wireless-technology standards and their application within healthcare.
b. To articulate the security issues of wireless technologies within healthcare.
c. To identify the potential for best practice in the implementation of wireless technology in healthcare using a case-study methodology.
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