The Leapfrog Effects of Wireless Networks for SMEs: Preliminary Findings from a Community Hospital

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Abstract

This article briefly summarizes a case study that investigates how wireless networks renovate a community hospital's competitive operations. Due to limited resources, this small community hospital failed to follow specific implementation patterns that most large or more advanced hospitals experienced. Consequently, older versions of wireless networks have never been implemented in this hospital. Interestingly, as technology capabilities of wireless networks continued to emerge in the industry, certain leapfrog effects of these emerging wireless technologies helped this hospital to surpass many of its larger competitors who continued to operate on older versions of wireless networks and relevant technologies. This community hospital's experiences thus provided insightful lessons for other SMEs that are facing constant technological changes in their respective fields.

Keywords: wireless network, leapfrog, SMEs, case study, hospital

Executive Summary

Wireless network and relevant mobile technologies have rapidly changed the business world and society [1-3]. Research community has also paid growing attention to this rapidly moving technology [4-6]. A variety of issues such as security [7, 8], network service provision [6], campus deployment of wireless LAN [7], and strategic positioning [9] have been widely discussed as well. Nevertheless, little attention is paid to some specific aspect—leapfrog effects—of wireless networks that might be of SMEs' (small and medium enterprises) particular interests.

The leapfrog effects derive its analogy from a game "in which one player bends down and is vaulted over by another player" (Merriam-Webster Dictionary). It implies that one organization leaps forward and surpasses the other without following certain orders or procedures that are normally expected. In the emerging technology environment, leapfrog effects have been known to provide evolutionary results to organizations or individuals [10, 11]. For instance, the lack of technology infrastructure allows some poor nations to implement advanced technologies without carrying out previous infrastructural or technological requirements [12]. This situation often occurs when the development of emerging technologies creates rapidly changing features all the time and thus imposes substantial pressure on decision makers and organizations, particularly those that lack of resources.

Facing the exponential growth of wireless networks and relevant technologies in recent years, SMEs, lacking resources in comparison to larger organizations, inevitably experience such situation. Since 1999, wireless networks have quickly evolved into several standards including 802.11b, 802.11a, 802.11g, and the emerging 802.11n (standards.ieee.org). The industry apparently observed a newer and more capable network standard nearly every other year. Under such rapidly developing technology environment, it has become increasingly difficult for smaller organizations to evaluate and implement specific wireless network technology that best suits their needs. In other words, before smaller organizations completely grasp the features of technological capability, newer devices or services might have already appeared in the market. How SMEs survive or even compete in such a constantly developing environment offers an intriguing question for research investigation.

My research investigation is based on the case study methodology, which aims to provide an in-depth understanding of participant organizations' experiences of wireless networks. Case study research is commonly recognized as a suitable methodology when the research purpose seeks a deep understanding of situations within single settings similar to my case investigation [13, 14].

The participant organization reported here is often considered as a small community hospital that was merged into one of the largest hospital chains in the U.S. in the late 1990s. Primary data collection was derived from semi-structured interviews with fifteen individuals including IT staff, physicians, nursing, and administrators. All interviews were digitally recorded and transcribed, which resulted in 134 single-spaced pages of textual data, which provided some preliminary findings of how leapfrog effects change this

community hospital's IT and business operations.

Examples of preliminary findings included:
(1) Late implementation of wireless networks also led to newer version and higher functionality of wireless network technology.
(2) Newer version of VoIP (Voice over Internet Protocol) phones provided more convenient and satisfying features to physicians and nurses.
(3) Other new development of wireless technologies that were recently available provided immediate benefits that other hospitals have not yet experienced.

Implications could thus be extended to SMEs that face similar turbulent technology environment. More specifically, while SMEs might lack of financial and technological resources, their network infrastructure and technology requirements are often less complicated, which allows more flexible implementation or agile upgrade. Such agile movement could create certain leapfrog effects that help SMEs surpass larger organizations that often require complex project planning to upgrade or renovate network infrastructure. More detailed discussion of managerial implications and future research directions will be provided at the conference.

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