WiFi Technology and Citywide WiFi Business Analysis

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Abstract

Rapid growth of Internet and dependency of many businesses and new services such as online banking, e-commerce, VoIP, etc. to the Internet, are the main reason of demand for Internet access. In addition, people are willing to have high-speed Internet access everywhere and at anytime.

It is more than 6 years that broadband Internet has provided the high speed Internet access to the users. However, this does not fulfill the market requirement for mobility and portability. The Internet penetration in many modern cities is around 50% to 60%, which about 40% to 50% of it is still dial-up connection. It was about 4 years ago, that many providers suggested the idea of providing fiber optic network for homes and businesses, but because of the high cost and some other reasons, this has never happened.

By the growth of wireless network and WiFi technology, a substitute solution, which was providing high-speed Internet access over WiFi network, was suggested. This idea, 'citywide WiFi mesh network', was offering many advantages over other wired solutions. Providing ubiquitous network and seamless connection to the Internet, fast design and implementation along with very low cost, portability and mobility, ease of upgrade and expansion and many more features were driving this solution as the best replacement for the current wired network.

Governments and municipalities supported this idea because using such a network would assist them to decrease lots of their costs by replacing the wired T1 Internet connections with its equivalent wireless connection and using VoWiFi technology to decrease their telephone costs. Besides, it can bring many other opportunities to the city that would help the economy of the city.

Citywide WiFi or *WiFi City* has opened many new opportunities for the cities. Providing a better Internet infrastructure throughout the city by making a blanket of WiFi Mesh network and giving broadband Internet access to everyone in the city, alluring more tourists to visit the city, attracting new investors to start their business in those cities that are taking advantage from WiFi network, bringing more security to the city by installing wireless camera in most of the places, potential interoperability with other businesses such as mobile operators, WiMAX networks, etc are just part of many opportunities that is brought by this solution.

In last few years, many cities have started or planned to implement the WiFi network in their cities. Grand Haven in Michigan was the first city in the world that successfully completed its WiFi City project in July 2004. Taipei as the first large and modern city has started its WiFi City project in 2004, and subsequently many other cities such as Philadelphia, San Francisco, Toronto, etc. have followed the same idea.

One of the big challenges in implementing such a network was developing a business model. At a time that Taipei has started its project, there was no working model at such scale around the world that can be used as a prototype. Therefore, Taipei and other cities have made their own business model based on their requirements.

This report is prepared in two phases. In the first phase, I have explained briefly the WiFi technology and wireless LAN standards, including some comments about the specifications of those standards and a comparison between WiFi and WiMAX.

In the second phase, which is from chapter 2 to 6 and covers the majority of this report, I have discussed about the WiFi City in general, wireless mesh network and replied some questions such as, what is WiFi City, who will get benefit of it, what are the possible challenges, etc. I have continued by looking at four WiFi City case studies. (Philadelphia, San Francisco, Toronto and Taipei)

In each case study, I have explained about the background and highlights of the project, the business and financial model, technical specification and at the end, I have completed each case study with a brief analysis about that case.

In the conclusion section, I have summarized my analysis about all case studies and their business strategies for citywide WiFi network.

According to Geoffrey Moore theory, citywide WiFi business is in Tornado stage. The technology has proved itself as a low cost solution and suitable replacement for wired network. Cities are competing together to lunch their network earlier than others to get benefit of using such a network. The benefits gained from the citywide WiFi network have been discussed in details in my report.

I have concluded that the most efficient business model for this type of project is the public/private partnership while it has no cost to the City. Such a model requires having the municipality be involved in the project to make sure that the service, which is provided by the private company, is meeting the city's requirements. Philadelphia WiFi network is a good representative of such a model. More detail about this business model is discussed in my report.

I have also discussed about Free WiFi network business model, the future wireless network standards (WiMAX, IEEE 802.11n) and their possible effect on citywide WiFi network, important points about ROI and the required financial model (mainly for private sector), competition between citywide WiFi network and other businesses (mobile operators and current wired Internet Service Providers), Michael Porter's five competitive forces model, and some factors that are required to be considered for this type of business.