The Significance of Government's Role in Technology Standardization:
Two Cases in the Wireless Communications Industry

DongBack Seo, University of Groningen, The Netherlands

EXECUTIVE SUMMARY

For first generation (1G) wireless communications technology standards, the Japanese government's early decision provided an opportunity for its national manufacturers to be first movers in the global market, while the late development of wireless communications in Korea made the Korean market dependent on foreign manufacturers by adopting the U.S. standard (AMPS). Moving toward the 2G wireless technology market, both countries decided to develop standards instead of adopting a technology from outside their regions. Japan developed its own standard, PDC, while Korea developed CDMA systems with Qualcomm, the U.S. technology provider. Although these governments' decisions on technologies looked only slightly different, the socio-economic consequences were greatly distinctive. The Korean success brought not only the rapid development of its domestic market but also opportunities for its manufacturers to become global leaders, while the PDC standard only provided the fast growth of the Japanese domestic market without any opportunities for the Japanese manufacturers to grow further internationally in the 1990s. By the end of 1990s, two nations again had to decide a 3G technology standard with vast challenges and pressures.

Keywords: *CDMA, Japan, Korea, PDC, Role of Government, Standardization, Technology Standard, Wireless Communications Technology*

ORGANIZATIONAL BACKGROUND

While it has always been true that governments play a critical role in the economy when they drive decisions about standards, today's rapidly changing and technology-dependent business environment has made the role of the government in standardization even more important. Some governments play their roles actively, whereas others leave it over to industries or a number of lobbyists.

DOI: 10.4018/jcit.2010010105

A standard declared by a government is considered as a *de jure* standard, while a standard emerges from market competitions is *de facto*. De Vries (2006) points out that this classification is confusing and provides more detail and specific definitions and a typology of IT standards by suggesting various aspects related to subject matter, standards development, and standards use. For the cases of Korea and Japan in this paper, standards refer to governmental standards that are set by a governmental agency in the classification related to organizations, according to the category of De Vries (2006).

Governments, especially those in developing countries or with planned economies, often nurture certain industries to drive the national economy. In order to do so, some choose to use their regulatory power to mandate standards in technology-dependent industries. This eliminates the need for companies to expend resources in competing to establish a standard through market forces, allowing them to focus instead on creating economies of scale, and developing complementary products. If the standard successfully creates network externalities and is cost-effective, the standard can diffuse to other nations. Then companies enjoy the benefits of being developers or early adopters, and can use their domestic market to develop subsequent technologies and test marketing strategies to export to other countries. They have the advantage of being able to innovate and move the market to the next generation technology before later adopters can catch up. End-users in the countries that adopt the technology earlier enjoy benefits as well, with lower prices and greater variety of products or services.

However, a government has power to mandate a standard only for its juridical region. There is no international organization to force any country to adopt a particular standard. Thus, to diffuse a standard to other nations (or make an international standard), a governmental standard in one nation has to go through competition in the international market (Funk & Methe, 2001). This process is often very competitive because other nations tend to push their governmental standards to be international standards as well.

For this reason, governments, like companies, can bet on the wrong standard. In this paper, the importance of the government's role will be illustrated by looking at two cases: South Korea (Note: it will be referred to Korea in the rest of paper) and Japan, in their choice of a national technology standard for wireless communications (governmental standards). Some countries like the United States have settled on standards in their wireless communication industry through open competition (*de facto* standards through company or consortium standards); many others, however, including Korea and Japan, have had a history of tight regulation of their telecommunications industries and only privatized them in the last few decades. Because of similarities in the Korean and Japanese wireless communication markets, these two cases provide a stark comparison of governments' roles and the economic and social consequences of the governments' decisions in technology standardization.

Japan

Japan, as a defeated nation in World War II, was devastated, so the first priority of the Japanese government was reconstructing the nation. With scarce resources and capabilities, the Japanese government was heavily involved in developing certain industries such as motorcycles, sewing machine, steel, and shipbuilding through directing necessary resources (Porter, 1990). Companies in these industries were able to gain competitive advantages under the government's support, protection from foreign competitors, and policies like market liberation in a timely manner. Although there were other factors such as demand conditions and disciplined workers, the role of Japanese government was significant in reviving its industries.