Chapter 4
Background of the Mobile Communications Industry

EXECUTIVE SUMMARY

Before we dive into how the mobile communications industry has developed, it is important to understand the general background of this industry. In this chapter, the background of the mobile communications industry is explained including historical and technological conditions and major actor groups as a foundation to approach the cases that are presented in chapter 5, 6, 7, and 8.

1. HISTORICAL BACKGROUND

Before the fifteenth century, people exchanged messages between distant regions through various methods such as beacon fires, messengers, and flags. The main purpose of most messages was related to military and sovereign matters of rulers. The development of the mobile communications industry is an extension of the evolution of postal service, telegraphy, and telephony. They were all designed to communicate more quickly over long distances as the socio-economic conditions of human activities changed.

Although individuals invented telephony technologies and founded private telephony companies, governments in many countries nationalized landline telephone networks in the late 1890s and early 1900s through World Wars I and II (Noam, 1992). After Alexander Graham Bell was awarded the U.S. patent for the invention of the telephone in 1876, he and his colleagues found Bell Telephone, which became the American Bell Telephone Company (AT&T) in 1880. AT&T enjoyed great market share as a virtual monopoly in the U.S. telephone industry, even though some small companies shared the market in some regions, until AT&T was broken up in 1984 by anti-trust litigation. Afterwards, the U.S. telephone industry was run by private companies. In contrast, the governments in many other countries ran their national telephone industry through their Post, Telegraphy, and Telephony (PTT) bureaus after nationalizing private companies. This was the situation before the liberalization of mobile communications operators in the 1980s and 1990s. The timing and development of the liberalization varied by nation.

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The European Commission started to encourage the liberalization of the mobile device market first in 1988 (Bekkers, 2001), while developing the pan-European 2G mobile communications technology standard. It urged mobile communications system manufacturers to abolish their special and exclusive relationships with mobile service providers. These relationships will be explained in more detail in the section of Background of the 1G Technology Standards in Chapter 5. Consequently, the service providers and customers had more options for mobile communications systems. This made the incumbent manufacturers confront more competition, while it was an opportunity for new entrants to join the mobile communications market. The Commission urged its members to open up the mobile communications service market in 1990 by allowing more mobile service providers into the markets, which had previously been dominated by monopoly PTTs. The liberalization in Europe affected the liberalization of mobile communications industries in other nations.

This historical background, which includes the history of policy changes, has influenced the standardizations of mobile communications technologies. Understanding this background will help to analyze actors’ situations, interpretations and strategies for mobile communications technology standards.

2. TECHNOLOGICAL BACKGROUND

The following description of basic mobile communications system architecture will provide a technological background with which to understand why and where technology standards are needed. The basic mobile communications system architecture consists of four main systems as shown in Figure 1 (Gallagher and Snyder, 1997).

1. Radio Systems: These systems include transceivers, antennas and controllers that are used to connect between a mobile device and a base station system through air-interface. Mobile device refers to cellular or mobile phones that end-users operate. The base station consists of the wireless transceiver and the transceiver controller equipment that serves one or more cells. It controls mobile communications functions on the network side when the mobile device communicates to the cellular networks (Gallagher and Snyder, 1997).

2. Switching Systems: These systems are interfaces within a cellular network and between the cellular network and other public switched telephone networks to coordinate the establishment of calls from and to a subscriber’s mobile device. Public Switched Telephone Network (PSTN) refers to “the telecommunications network commonly accessed by ordinary telephones, key telephone systems, private branch exchange trunks, and data transmission equipment that provides service to the general public” (Gallagher and Snyder, 1997, pp. 412).

3. Data-Based Systems: Known as a location register, data-based systems provide information about subscribers along with service logic to control mobile services. These include a subscriber’s phone number, the current location of the mobile device, subscribed features such as call forwarding and voice mail, and other options.

4. Operations, Administration, and Maintenance (OA & M) Systems: These systems are not shown in Figure 1, but they are integrated within systems to allow service providers to examine operations, to adapt the network equipment and functions, and to troubleshoot defects within the network.
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