Chapter 3

Preface to the Research on Standards in the Mobile Communications Industry

EXECUTIVE SUMMARY

In this chapter, the Self-Organized Complexity Unfolding Model and the Framework of Organizational Standards Strategy are applied and explored further to the evolution of standards in the mobile communications industry. To introduce the mobile communications industry, three different infrastructures that presently exist at the beginning of the 21st century for communication over long distances are discussed. The reason to present them is to illustrate the position of the mobile communications industry in our society and how it is related to other industries.

1. THREE DIFFERENT INFRASTRUCTURES

First is the landline infrastructure, which has the longest history. This infrastructure includes telephone service providers that implement and maintain the physical network, systems manufacturers that produce systems for telephone service providers, and users.

Second is the mobile communications infrastructure. Mobile communications infrastructure requires more sophisticated techniques than landline infrastructure to provide mobility. Service providers and manufacturers for the mobile communication infrastructure are similar to those for landline infrastructure. Although some providers have both landline and mobile communications infrastructures and some manufacturers produce systems for both infrastructures, many new actors have entered the market since the dawn of the mobile communications industry. Another thing to notice is that the landline and mobile communications infrastructures are interrelated in order to facilitate calls between mobile handsets and landline telephones. More detailed information about mobile technological systems will be provided in the section of Technological Background in Chapter 4.
Third is the Internet network based on different media (e.g., Digital Subscriber Loop [DSL], fiber optic cable, etc.). Many actors from the computing industry, which are typically distinct from those in the communications industry, are involved in establishing the Internet network. With Voice over IP, many Internet service providers are able to provide services similar to what communications service providers have traditionally provided. Manufacturers for the Internet network systems (e.g. Intel and Cisco) have different backgrounds from those in the communications industry. This infrastructure has begun to interact with landline and mobile communications infrastructure in the converging network.

2. EVOLUTION OF MARKET

Before investigating organizational standards strategies that have affected the evolution of self-organized configuration in the mobile communications industry, it is worth understanding the evolution of the market at the industrial level. In the developed countries, governments and companies first concentrated on building national landline networks before the advent of mobile communications technology. In this nascent, pre-1G (first generation) technology stage, mobile communications services were very limited, with mostly manual systems. The 1G period opened up the mobile communications market for commercial use by providing mobility to users, but the service was still expensive and the capacity of the systems was limited. Thus, the 1G market was restricted to a very small number of customers. The evolution of the market from 1G to 2G created a new mass market with affordable prices for all kinds of mobile users from business people to young students. In the developed countries, competition among mobile service providers became intense as 2G matured, bringing prices down. The mobile service providers started to seek new sources of revenue, and there was a new market need for data delivery when the Internet market expanded rapidly in the late 1990s and early 2000s. Thus, the market is now evolving toward 3G, offering different kinds of services other than voice delivery, so service providers can increase or at least maintain ARPU (Average Revenue Per User).

3. EVOLUTION OF TECHNOLOGY

The market has leapt forward at each stage with each new generation of technology. Without technological supports, it is impossible for the market to evolve as it has. Although it is arguable whether markets have driven technologies or vice versa, there is no doubt that there are mutual influences between technology and market. The 1G mobile communications technologies such as NMT and AMPS (Advanced Mobile Phone System) were based on analogy and cellular system, which was more sophisticated than the primitive technologies used before the 1G period. However, 1G technologies still had technical limits. The most distinctive difference between 1G and 2G was that 2G mobile communications technologies (e.g. GSM and IS-95) were digital, which increased capacity and quality and required lower battery power for handsets. 2G technologies provided services and products with lower prices for a vastly increased number of users. In contrast, 3G mobile communications technologies (e.g. WCDMA and CDMA2000) have focused on increasing bandwidth capacity to provide more advanced services, for example, Internet browsing.

The development and implementation of a mobile communications technology requires greater resources and capabilities than any single organization can afford, because all systems (e.g. mobile devices, base station systems and switching systems) have to be compatible with each other to provide a seamless service. For this reasons, actors in the industry need to cooperate and standardize a mobile communications technology, so they can provide services and products at affordable prices to create a mass market.