

■ KENNETH E. KENDALL, Feature Editor, School of Business-Camden, Rutgers University

CELLULAR PHONE SUBSCRIBERS have passed the 1.6 billion mark in the world, with 180 million in the United States as of March 2005. Several leading cellular phone service providers have chosen Korea and Japan as a testing ground to assess the effects of third generation (3G) and 3.5G technology and deployment. The younger generation of cellular phone users in Japan and Korea associate the trend of cellular phones with their social status. This month's timely and insightful column by Professor J. P. Shim presents a current status of cellular phone services and applications in Japan and Korea.

Why Japan and Korea Are Leading in the Mobile Business Industry

by J. P. Shim, Mississippi State University

Wireless network technologies have witnessed exciting innovations and will continue to represent a rapidly growing sector in the near future. While 3G or 3.5G mobile networks offer broadband transmission with speeds of up to 2Mbps or 10Mbps in faster areas of the world, other countries lag behind with "kbps" speed. 3G or 3.5G wireless access systems provide basic data services along with voice and messaging capabilities. At this time, telecommunication vendors and service providers' research efforts are going towards developing a true broadband wireless cellular system, also known as 4G (using OFDM and MIMO technology).

Asian countries such as Japan and Korea once lagged behind the West in information technology (Budde, 2002). Despite its late entry into the market, Asian wireless operators, with the assistance of government policy, have been able to become global leaders with the implementation of the 3G or 3.5G technologies. NTT DoCoMo, a primary Japanese 3G carrier, was the first to roll out the world's first 3G services in Japan. Technologies that are referred to as 3G (CDMA 2000) or 3.5G (HSDPA) service are revolutionary in that they allow for 3D games, videoconferencing, full motion videos, and high-speed

Internet access on full roaming mobile phones. As Table 1 shows, there are three cellular service carriers in Korea: SK Telecom, KTF, and LG Telecom, of which SK Telecom remains the dominant service provider with 52 percent of the market share.

In Japan, there are three major cellular service providers: NTT DoCoMo, KDDI, and Vodafone. Although NTT DoCoMo remains the dominant carrier in terms of number of subscribers, KDDI dominates the 3G service in Japan with a 61 percent market share (Table 2).

Among the Asian countries, Japan and Korea are the two leading countries that have the highest per capita penetration rate of cellular phones and mobile services in the world. Nearly two-thirds of Japanese and Korean mobile phone users have switched to 3G handsets—these offer speeds of up to 10 times that of mobiles in the U.S. According to <http://www.umtsworld.com/industry/Subscribers.htm>, there are 86.6 million users in Japan, representing a penetration of 68 percent, and 37.4 million users in Korea, representing a 76.7 percent penetration.

Current Cellular & DMB Phone Services in Korea and Japan

The mobile handset has evolved into a universal remote control which has



J.P. Shim

is professor of MIS and the director of International Business Strategy Program at Mississippi State University. He received his Ph.D. from the University of Nebraska, an MBA from Seoul National

University, and completed the Harvard Business School's Executive Education Program. Dr. Shim was the John Grisham Faculty Excellence winner in 1994 and has received numerous grants and awards, including NSF, Microsoft, Mississippi Institution of Higher Learning, and is a seven-time recipient of the outstanding faculty award. He was selected as a U.S. representative for the 1996 Japan Study Tour sponsored by AACSB and Japan KKC. He was a program chair for U.S.-Japan e-Business Conference sponsored by the National Science Foundation and Japanese JSPS. Very recently, he has been invited as a plenary speaker at the 2005 Mobile Wireless Industry Expo at COEX in Seoul.

jshim@cobilan.msstate.edu

Research Methodology and Findings

To determine the extent in which cellular phones are being used in Japan and Korea, the author developed and distributed a questionnaire in 2004 to 310 and 340 people in Korea and Japan, respectively, randomly selected from the following occupations: students, professional staff, self-employees, and business executives. Participants were from four major cities in Korea (Seoul, Daejeon, Daegu, and Kwangju) and two major cities in Japan (Tokyo and Yokohama). The two-page questionnaire was divided into two main sections and contained a total of 30 questions. A detailed statistical analysis can be obtained by writing directly to the author.

This data analysis is a descriptive study which presents a simple comparison on cellular phone usages among Japanese and Koreans. Figures 1-4 depict all users' perceived values on issues with cellular phone, such as handset replacement frequency, peer pressure, and design/appearance issues. The Korean and Japanese consumers displayed great interest in purchasing a cellular phone handset, with the Koreans at 76 percent and the Japanese at 67 percent. When it came to the frequency of replacing cellular phone handsets, Japanese customers generally replaced their handsets every year, which is more frequent than that of their Korean counterparts, who changed about every two years.

The phone's physical size and weight was found to be of high importance for both the Japanese (42%) and Korean consumers (45%). Another factor ranked of high importance by the Japanese (43%) and Koreans (50%) was the cell phone's additional features.

Nearly half of the respondents for both Japan and Korea felt the screen display of the cell phone (especially the color, size of screen, and resolution) were of importance when selecting a cell phone.

Provider	Subscribers (millions)	Market Share (%)
SK Telecom	18.6	52
KTF	11.8	32
LG Telecom	5.7	16

As of July 2004
 Source: http://www.sktelecom.com/english/down/The_FKI_Korean_Corporate_Global_Roadshow.pdf

Table 1: Three major cellular service providers in Korea.

Provider	Subscribers (millions)	3G Subscribers (millions)	3G Marketshare (%)
NTT DoCoMo	48.3	10.2	36
KDDI	19.1	17.4	61
Vodafone	15.1	.7	3

As of February 28, 2005
 Source: <http://www.wirelesswatchjapan.com>

Table 2: Three major cellular carriers, customers, and 3G subscribers in Japan.

been integrated into a person's daily life—in education, residence, and leisure and entertainment (Fortune, 2004; Mathew et al, 2004). Currently, Korea and Japan are the leaders of digital multimedia broadcasting (DMB) market, as commercial satellite digital TV broadcasting to mobile handsets has already begun due to public and personal demand for DMB services. These DMB markets will be important arenas for the validation of the new DMB technologies that are driven by user demand and the changes in the culture of technological usage.

Satellite DMB and terrestrial DMB enable users on the move to enjoy various contents such as seamless video, CD-quality audio and data through hand-held devices and in-automobile terminals (Republic of Korea MIC, 2005). The cellular phone can be currently used in a plethora of ways in Korea and Japan including uses in education, leisure and home entertainment, daily life, and home automation and monitoring (Fortune, 2004; Shim et al, 2004).

Hypotheses

Most Asian people (especially Japanese and Korean) have cultural similarities regarding their penchant for fashion, brand name, and novelty. For instance, the moment that new electronic products and cellular phones are first released and marketed to the public, the Japanese' and Koreans' zealous tech gadget nature lead them to impulsively purchase the "must have" toys. Therefore, it is hypothesized that:

H1: There is no marked difference between the two groups (Japanese and Korean) in terms of handset replacement frequency.

H2: There is no marked difference between the two groups in terms of importance of service plan/service provider.

H3: There is no marked difference between the two groups in terms of design and appearance of the handset.

H4: There is no marked difference between the two groups in terms of peer (friend) pressure.

Why Korea and Japan Lead the World in Mobile Technology

Korea and Japan lead the way in mobile technology due to eight major reasons (Shim, 2005).

First, Japanese and Korean have cultural similarities regarding their penchant for fashion, brand name retail items, and novelty. When the 3G cellular phone handsets were released in Japan and Korea, the users' handset replacement frequency varied from 6 months to two years (see H1).

Secondly, the Asians (especially, Koreans) live in an intense culture in which the *bbali-bbali* (translation: speed up and "hurry-up" in Korean) syndrome has sped up all processes more than ten-fold. This applies to a wide range of behavioral patterns from rapidly eating to repeatedly pressing the elevator button, and, of course, acquiring the latest model of mobile phones.

Thirdly, the Korean and Japanese parents' primary focus is on their children's education. Although the parents may experience financial difficulties, the focus remains on their children's education as a first priority. The parents' support of their children's wants and needs includes not only their children's cell phone bill, but also extends to the pricey handsets. Thus, the children go on to take advantage of the mobile phones' newest offerings—tracking service, games, TV channels, camcorder, MP3, SMS, camera, GPS, etc. The combination of high mobile user subscriber rate and the wide range of services has led to the success of Korean and Japanese mobile service providers. As several recent studies showed (Fortune, 2004; Shim et al, 2004), most Korean and Japanese youngsters usually replace the integrated, multi-functional cellular phone every 6 months to one year.

Fourth, the technology "infrastructure" is pervasive in Japan and Korea. Since Korea was the first country to have commercialized Code Division Multiple Access (CDMA), Korea was able to differentiate itself from other countries such as the U.S. that have sev-



Figure 1: Handset replacement frequency.

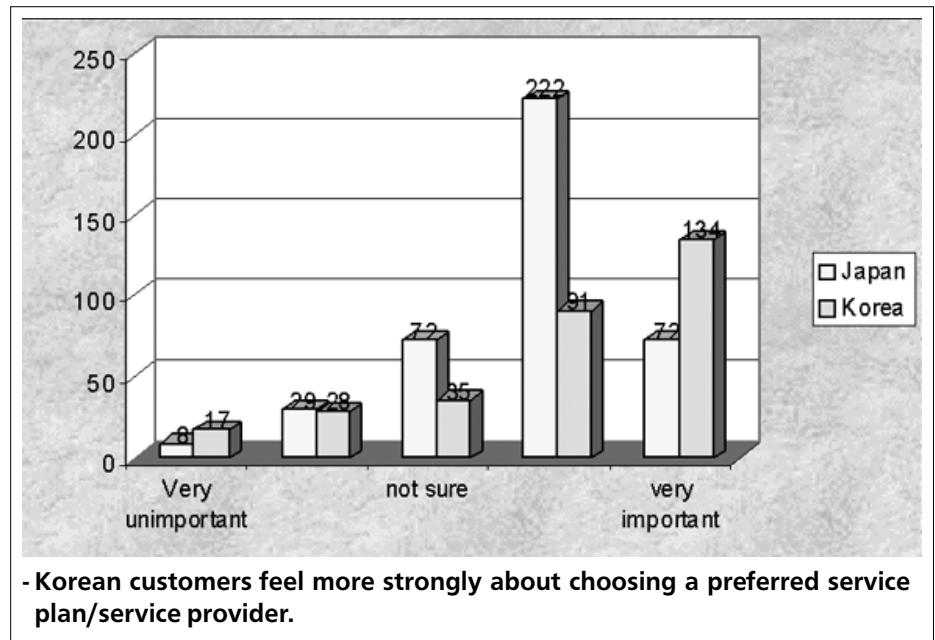


Figure 2: Service plan/Service provider.

eral standards including Time Division Multiple Access (TDMA) and Global System for Mobile communication (GSM). Korea is currently in the stage of rolling out 3G and 3.5G networks (Fortune, 2004; Dekleva, 2004; Shim et al, 2004; Jacobs, 2003). Japan is the first country in the world to introduce 3G

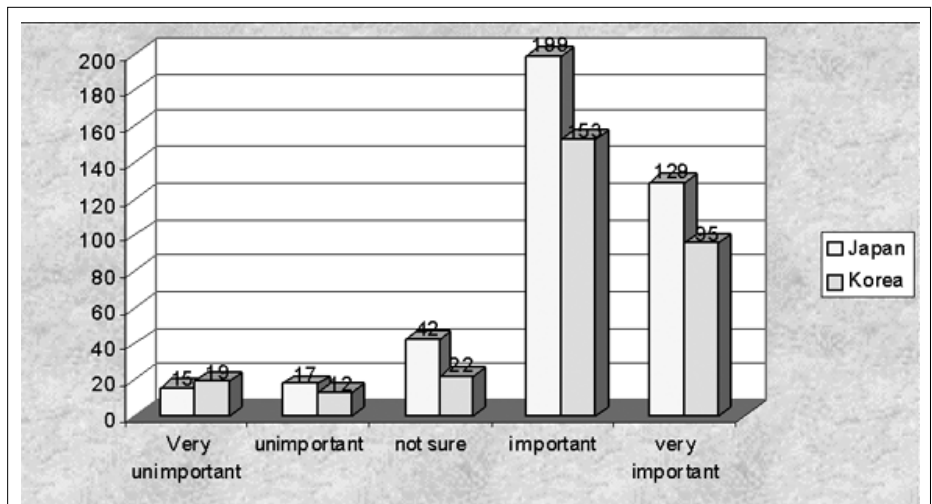
mobile communications: NTT DoCoMo, a major Japanese service provider, began public 3G (FOMA) services in May 2001. As Japan's 3G services enters its fourth year of commercial service, there are concerns of it reaching a stage of maturity. With the government's push to meet this huge consumer demand for

electronics, there are shopping districts that are zoned specifically for electronic gadgets, such as “Akihabara” district in Tokyo, Japan, and “Yongsansangka” district in Seoul, Korea.

Fifth, with the exception of U.S., users in other countries do not pay for incoming phone calls on their mobile phones. The users only pay for the usage time in outgoing calls. Since the users do not pay for the incoming calls, they do not see this as an issue and pay no heed to the minute usage.

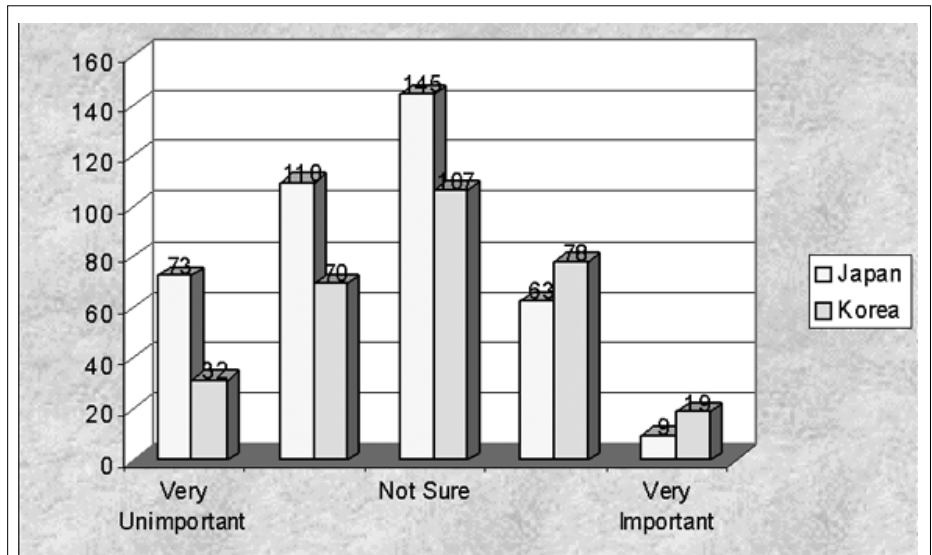
Sixth, with the Korean government’s (the Ministry of Information and Communication) push and drive to meet this huge consumer demand for electronics, Korean chaebols (a conglomerate of many companies clustered around one parent company) have employed aggressive IT planning to implement remarkable cellular phone technology and the Internet. Over the past several decades, Korean chaebols such as Samsung, LG, and SK have had enormous influence on IT and related sectors (Khanna & Palepu, 1999). Recently, the Korean government developed an IT strategy implementation plan spanning across the areas of services, infrastructure, and new growth engines (Republic of Korea MIC, 2005). On the other hand, Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications stressed the importance of building a ubiquitous network society that spreads throughout the world (2004 White Paper on Information and Communications in Japan).

Seventh, about 68 to 77 percent of Korean and Japanese are currently using cell phones. Without cellular phones, it is very inconvenient for one’s daily life due to everyone’s dependence on cell phones. Although the younger generation in Japan and Korea associate the trend of cellular phones with their social status, most users are less likely to consider the “new” cellular phone as a social status. The cellular phone usage (such as rollover phone usage and sending photos) and frequent cellular phone replacement boost Korea and Japan’s cellular phone mak-



- Japan’s and Korea’s preferences are similar regarding the design of the handset.

Figure 3: Design/Appearance.



- Korean consumers ranked the peer-pressure factor slightly higher than that of their Japanese counterparts.

Figure 4: Peer/Friend pressure.

ers and service provider’s mobile business.

Lastly, Korea and Japan are both densely populated territories when compared to the widespread and vast lands of the West. Thus, it is easy to install “base transceiver stations” (towers) in Korea and Japan. Due to smaller land size and close proximity of towers, most Korean and Japanese people have a favorable experience with cellu-

lar phones’ excellent reception and advanced voice quality.

The mobile services and applications have begun to experience some success, due to the Asian wireless operators’ close relationship with their equipment makers and their enormous influence over this value chain. The future success of mobile business depends on the wireless application developers’ utilization of wireless technology and

devices, and the deliverance of those desired applications to the users. The mobile cellular phone brings up ethical, private, and legal issues. A great number of cellular phone users are plagued by cellular phone spam messages. Recently, laws in Japan and other Asian countries have banned camera cell phones in public baths (bathhouse). In Korea, hundreds of Korean high school students were under investigation for cheating on a college scholastic ability exam using cell phones. Even though there are serious problems posed by cellular phone services, the advantages of cell phone services in education, residence, leisure and entertainment, and daily life outweigh the disadvantages.

Conclusion

Very recently, satellite digital multimedia broadcasting (DMB) has received a great deal of attention from Korea and Japan, thanks to its strength and growth in the cellular phone industry. Satellite DMB and terrestrial DMB enable users on the move to enjoy various contents such as seamless video, CD-quality audio and data through handheld devices and in-automobile terminals (Republic of Korea MIC White Paper, 2003). Several Korea and Japan mobile carriers began the world's first handset-based DMB services via cellular phones. Also, the Korea and Japan government have plans to launch ubiquitous computer technology that is accessible anywhere and anytime; this is beneficial particularly for users in rural areas and for the physically handicapped (Republic of Korea MIC White Paper, 2003). The trend of upcoming satellite DMB, terrestrial DMB, u-commerce, and u-business in Asia will play an important role in the near future and will be beneficial to users.

The cellular mobile service industry has complex issues that span across logistical, social, cultural, and technical issues. This requires cooperation among the cellular and network service providers, service developers, and handset makers to collaborate with the govern-

ment and consumers. Of the eight factors listed above, the government's commitment and push for information technology strategy and long-term goals are the most important and challenging factor for less developed or other countries to advance its own cellular mobile business industry.

Acknowledgements: The author would like to acknowledge Professors Yoshiki Matsui (Yokohama National University), Osam Sato (Tokyo Keizai University), Younsuck Youn (Kwangwoon University), Jaejon Kim (Chonnam National University), and Youngjik Kwon (Taegu University) for helping me to collect "primary data" from their students.

References

- Budde, P. (2002). Asia and Australia telecommunications industry overview. *Annual Review of Communications*, 55, 243-250.
- Dekleva, S. (2004). M-Business: Economy driver or a mess? *Communications of the ACM*, 13, 111-135.
- Fortune. (2004). Broadband wonderland. September 20, 191-198.
- Jacobs, I. (2003). What is next for the computer/camera/GPS receiver in your pocket—your cellphone? *Proceedings of Wireless Telecommunications Symposium*, Pomona, California.
- Khanna, T., & Palepu, K. (1999). The right way to restructure conglomerates in emerging markets. *Harvard Business Review*, 77(4), 125-134.
- Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan. (2004). 2004 white paper on information and communications in Japan." Available online at <http://www.johotsusintokei.soumu.go.jp/whitepaper/eng/WP2004/2004-index.html>
- Mathew, J., Sarkar, S., & Varshney, U. (2004). M-commerce services: Promises and challenges. *Communications of the AIS*, 14.

Republic of Korea, Ministry of Information and Communication. (2005). U-Korea: Humanism in the digital world IT 839 Strategy.

Shim, J. P. (2005). Korea's lead in mobile cellular and DMB phone services. *Communications of the AIS*, 15, 555-566.

Shim, J. P., Varshney, U., Dekleva, S., Knoerzer, G., & Onalfo, V. J. (2004). Mobile and wireless services and technology: Evolution and trend. *Proceedings of 2004 Americas Conference on Information Systems*. ■

Kenneth E. Kendall, Feature Editor
 School of Business-Camden
 Rutgers University
 Camden, NJ 08102
 (856) 225-6586
 fax: (856) 424-6157
 ken@thekendalls.org
 http://www.thekendalls.org

Future DSI Annual Meetings

November 19-22, 2005

The San Francisco Marriott
 (Downtown)
 San Francisco, California

November 18-21, 2006

The San Antonio Marriott
 Rivercenter/Riverwalk Hotels
 San Antonio, Texas

November 17-20, 2007

The Marriott Desert Ridge
 Resort & Spa
 Phoenix, Arizona

November 22-25, 2008

Baltimore Marriott Waterfront
 Hotel and Courtyard by Marriott
 Baltimore, Maryland

November 21-24, 2009

Hyatt Regency New Orleans
 at the Superdome
 New Orleans, Louisiana

November 20-23, 2010

San Diego Marriott Hotel and
 Marina
 San Diego, California