

## Term Project

- Mobile Internet usage through the Smart Phone in Korea -

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### 1. Background

In these days, almost every person in Korea has a mobile phone. However, they do not use the wireless Internet service a lot although most of them are the users of a broadband Internet service. In Korea, many new smart phones including iPhone and Blackberry were introduced in this year, and the market fluctuates dynamically since the abolition of WIPI in last April. But the wireless Internet users are not still much comparing to other countries such as US and Japan.

This paper will show the current situation of wireless Internet uses in US and Korea, compare mobile data tariff in US, Europe and Korea. Then, the paper might answer whether the data tariff in Korea should keep or go down.

### 2. Introduction

#### 2.1. Definition

Although the people use the term, mobile Internet, so often, the definition of the term have not been defined clearly. Therefore the definition of the term is important. Devine and Holmqvist defined mobile Internet in 2001 in their article. They said mobile Internet is *Data transactions conducted over a mobile communication system. Data traffic or non-voice traffic is a broad term that among other things includes SMS, e-mail, downloading websites and advertising<sup>1)</sup>*. Also, they defined mobile Internet

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1) Devine and Holmqvist, 2001

services in the same article: *It enables a user to connect to the Internet through his mobile phone. These are the service that the operators provide when they enable access<sup>2)</sup>*. Although, those definition has some limitations, but the core idea is clear and can be applied in this paper.

In another view point, the definition of the smart phone is not also clear. The functions of the current mobile phone are very complicated, therefore lots of people have difficulties in distinguishing the high-end mobile phone and smart phone. Some high-end phone is considered as smart phone in the market. There is no simple definition of the smart phone, but Huang and Tsai described the characteristics of the smart phone like Table 1.

<b>Appearance</b>	The size is small, short, light and thin. The appearance is not restricted to either mobile phone or PDA.
<b>Functions</b>	It Is used mainly in voice communication. Digital Transmission is also included. It uses advanced mobile operation system. It is equipped with personal information management function. The information can be exchanged or synchronized with other information products
<b>Input Methods</b>	It is not restricted to keyboard or touch sensitive panel. Voice recognition is also possible.

[Table 1] Characteristics of the smart phone<sup>3)</sup>

## 2.2. Technological Trends

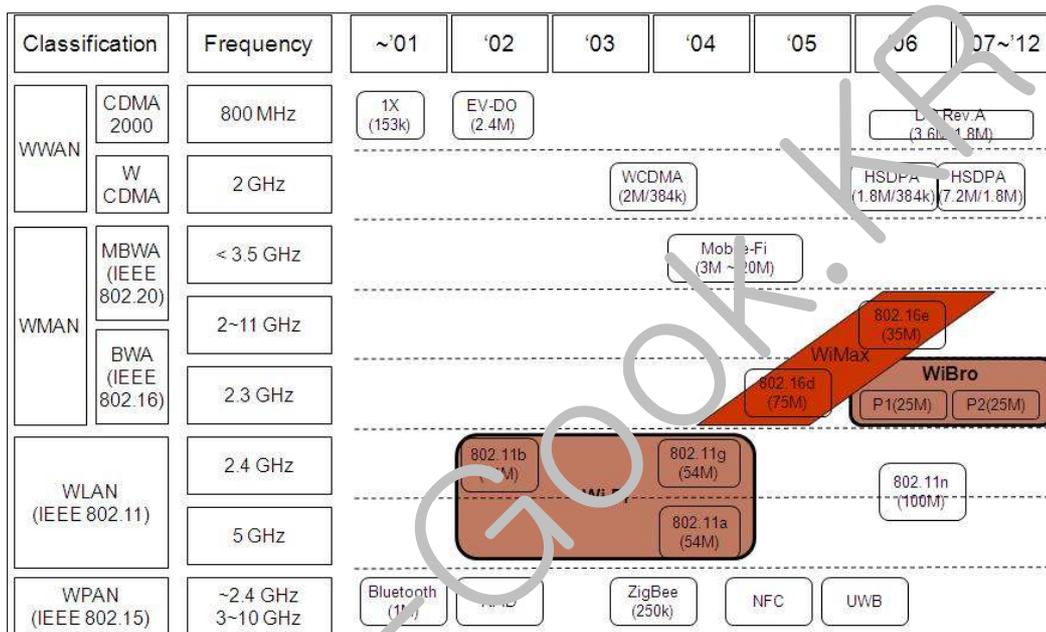
The speed of the development of information and communications technologies are very quick relatively. During the last ten years, lots of new network technologies emerged and have been developed. Some of them are used widely, but some of them has gone behind the history. Figure 1.

Network technology for mobile phone started from GSM and CDMA. In these days W-CDMA is widely used, but EV-DO is still used. Also, in the case of Korea, one MNO uses CDMA Rev.A. Bluetooth is also another techology used for personal

2) Devine and Holmqvist, 2001

3) Huang and Tsai, 2007

purpose. Many portable devices support Bluetooth technologies, and its recent version is v3.0. In this year, Bluetooth Direct was announced and it might compete against WiFi technologies. Wi-Fi technologies are very powerful technologies for wireless Internet. Almost all the laptop support Wi-Fi - 802.11 a/b/g. In this year, 802.11n was decided as the new Wi-Fi standard, and many manufacturers welcomed it. WiFi may be one key technology in next some years. WiMax and WiBro has small network area still, but it has lots of potentiality based on the strength of the technology.



[Figure 1] Trend of Network Technologies<sup>4)</sup>

Also, the portable devices have been changed much. Im(2006) described the trends in three categories; terminal application, terminal platform and device capability. First, in the view of terminal application, he mentioned user interface. User interface has been based on simple graphic, but new devices support rich graphic user interface. Second one is terminal platform. The old platform support development service according to each solution, but new platform may support multimedia solution. In addition, the current codec such as MPEG-4, H.264 and AAC+ will not be used, but the next generation codec will be used widely. Third trend is device capability. Newly coming devices will has high capability processor and graphic chip, increased memory. Also, they will support QVGA or VGA, now supports QCIF. In addition, the each device may support multi-access technologies to different networks. Current devices usually support WAN, IrDA, PC cable and Bluetooth, and they will support MM-MB, HSDPA,

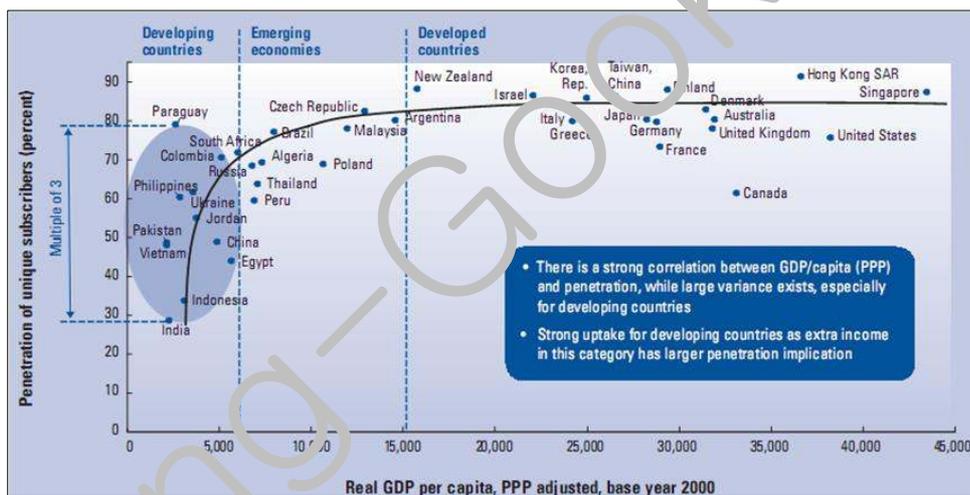
4) Im, 2006

WPAN also.

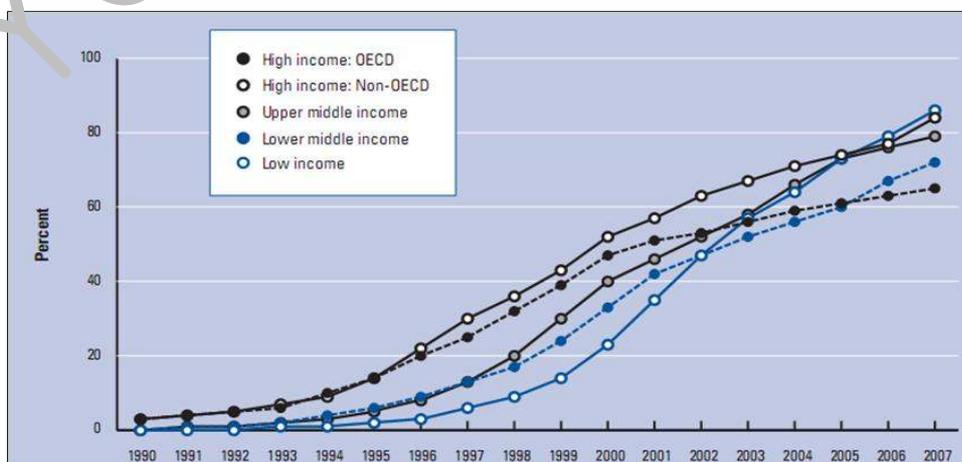
### 3. Foreign Market

#### 3.1. Global Mobile Market

Figure 2 shows the relationship between national income level and mobile penetration rates. Income level was measured by real GDP per capita. As figure shows, there is a relationship although there are some exceptions. Most of the nation with high income has a large penetration rates. You can find similar implication from Figure 3 and Figure 4 also.

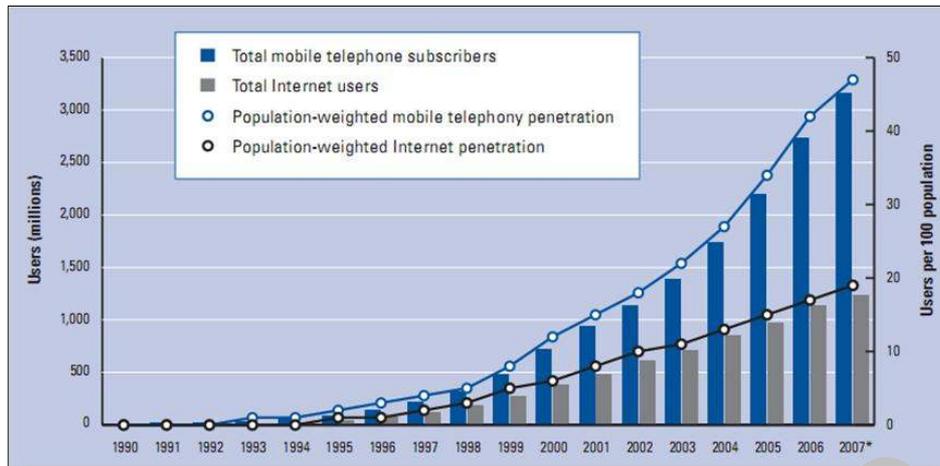


[Figure 2] Mobile Penetration Rates vs. Income Level<sup>5)</sup>



[Figure 3] Share of mobile subscribers in total telephone subscribers<sup>6)</sup>

5) WICS; EIU, 2008



[Figure 4] Mobile Telephony penetration and Internet Usage<sup>7)</sup>

### 3.2. Wireless Internet Usage in US

In last July, John Horrigan issued a paper which shows survey results done by Pew Internet American Life Project. The paper shows lots of interesting trends in wireless Internet usage in America. Some of them are listed here again.

- 56% of all Americans have accessed the Internet by wireless means.
  - 39% : via laptop computer
  - 32% : via other mobile devices including mobile phone, iPod, game consoles, or e-books
- Use of the Internet on mobile devices has grown sharply from the end of 2007 to the beginning of 2009.
- Broader measure of use of mobile digital resources also show fast growth.
- When mobile users are away from home or the office, they like mobile access to stay in touch with others, but also to access information on the go
  - 50%: It is very important to them to have mobile access in order to stay in touch with others
  - 46% : Mobile access is very important for getting online information on the go

### 3.3. Tariff for Wireless Internet - EU and US

The tariff for wireless Internet is very different according to the company and the

6) ITU, 2008

7) ITU, 2008

nations. Actually, there are so many telephone companies in the world and each company has various plans in its tariff system. It is not simple to compare all of them, so I chose few plans which were significant issues in the market. Six companies from three nations are selected and their tariff are like following.

First company is Vodafone in Portugal. Vodafone announced the new plan called *Vita Net Light* in June, 2009. If the user pays 10 Euro, s/he can access the data network during 10 hours. This one is unique, because usual data plans limit data traffic and time at same time.

Second company is Hutchison3 in United Kingdom. This plan was announced in June, 2009 also. The user can enjoy 15GB data for £15 per a month if s/he can have a long-term contract with Hutchison3. Unless the user can have a long-term contract, s/he can use 5GB data for £15 per a month.

O2 in United Kingdom has also similar plans. But its price is a little bit higher than that of Hutchison3. The long-term user can enjoy 10GB data for £30 per a month and the general user has to pay £15 for 3GB per a month. O2 has also iPhone plans. The next table shows iPhone plan of O2, UK.

	£35 / month	£ / month
<b>iPhone (8GB)</b>	£99	Free
<b>iPhone (16GB)</b>	£159	£59
<b>Voice Call</b>	600 min	1,200 min
<b>SMS</b>	500	500

[Table 2] iPhone Plan of O2 in United Kingdom

Clearwire is US WiMax carrier. It started its business in the early of this year at Portland, Oregon. Its tariff plan is shown in Table 3.

	Name	Limit	Max Speed	Initial Payment	Monthly
<b>Home</b>	Basic	None	768kbps / 128Kbps	\$35	\$20
	Fast		3.0Mbps / 384Kbps		\$30
	Faster		6.0Mbps / 512Kbps		\$40
<b>Mobile</b>	Occasional	200MB	4.0Mbps / 384Kbps		\$30
	Frequent	2GB			\$40
	Unlimited	Unlimited			\$50

[Table 3] Tariff Plan of Clearwire

The tariff of Clearwire can be discounted by 10 USD if the user make a long-term contraction with Clearwire.

T-Mobile in US has provided new tariff plan since the last October. T-Mobile is the fourth largest mobile network operator in US. Recently, the customers of T-Mobile had moved to Verizon Wireless, AT&T, and other small MNOs, because of their unlimited data plans. New plan suggests unlimited voice, SMS, and data communication, and the monthly fee is only 79.99 USD. It is very low price comparing to the legacy plan (\$99.99/month).

The last one is AT&T in US. AT&T and Apple, Inc. announced their new plan optimized for iPhone users. Table 4 shows it.

<b>Monthly Fee</b>	\$59.99	\$79.99	\$99.99	\$119.99	\$169.99	\$219.99
<b>Voice (Min)</b>	450	900	1,350	2,000	4,000	6,000
<b>Data</b>	Unlimited Data Traffic					
	Support visual voice mail					
<b>SMS</b>	200					
<b>Night &amp; Weekend call</b>	5,000	Unlimited				
<b>b/w mobile</b>	Unlimited					
<b>Additional Call</b>	45cent/min					

[Table 4] iPhone Plan of AT&T in US

## 4. Korean Market

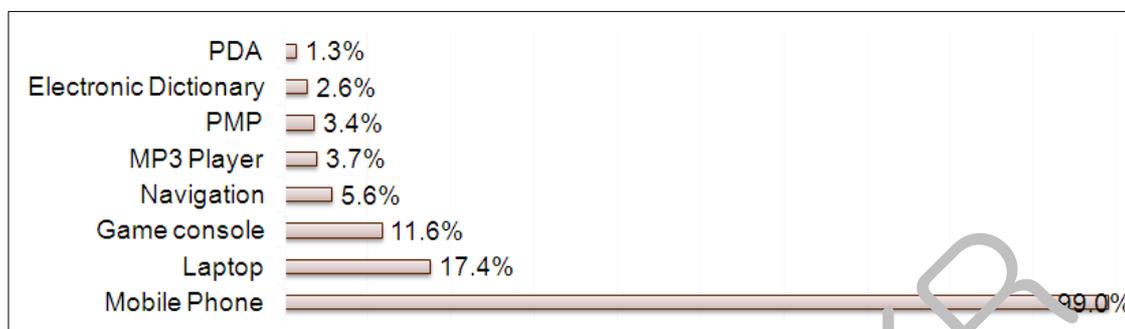
### 4.1. Wireless Internet Uses in Korea

During the last September, KISA(Korea Internet & Security Agency) surveyed 3,000 people about their wireless Internet usage. Final report was issued in November, 2009. Some of the results are listed.

- 99% of the wireless Internet user uses the mobile phone. People use laptop and other portable player also, but the mobile phone is a key tool for wireless Internet.
- 54.9% of 12-59 years old people are the wireless Internet user.
- 52.6% of 12-59 years old people are the wireless Internet user using the mobile phones.
- Smart phone users' wireless internet usage rate is higher than that of normal

mobile phone

- Smart phone users: 80.7%
- Mobile phone users: 48.7%



[Figure 5] Device for Accessing Wireless Internet<sup>8)</sup>

Because the Korean government regulated that every mobile handset should embed WIPI, the smart phones made by foreign company were not sold in Korea. However, WIPI policy was abolished since the April, 2009, and very innovative smart phones are struggling in Korean mobile handset market. Samsung released Omnia in November, 2008. The mobile network operator was SK Telecom. SK Telecom also started to sell Blackberry for the corporate customers since December, 2008. During 2009, Xperia (Sony) and some other smart phones were released in Korea. And finally, iPhone was launched by Korea Telecom at the end of November, 2009.

#### 4.2. Tariff for Wireless Internet in Korea

Korean mobile network operators have dual system for data traffic. One is WIPI based system (See the Table 5) and the other is open access system (Table 6 & 7).

	MNO	Fee
<b>Tariff</b> ( /0.5KB)	<b>SKT</b>	Text(4.5), Small-multimedia (1.75), Large-multimedia(0.9)
	<b>KTF</b>	Text(4.55), Media (1.75), VoD(0.45)
	<b>LGT</b>	Text(5.2), Media(2.0), VoD(1.04)
<b>Unlimited Plan</b>	<b>SKT</b>	26,000 won per month
	<b>KTF</b>	24,000 won per month
	<b>LGT</b>	20,000 won per month

8) KISA, 2009

[Table 5] Data Tariff based on WIPI

SKT and KT announced its plan for smart phone in 2009. Table 6 shows the plan of SKT. Only the user of smart phone can enjoy All-in-one plan. Monthly fee starts from 45,000 Won, and the maximum basic fee is 95,000 Won. KT started its iPhone plan in November, 2009. The minimum fee is 35,000 Won and the maximum basic fee is 95,000 Won. The price range is similar to that of SKT.

	All-in-one 45	All-in-one 55	All-in-one 65	All-in-one 80	All-in-one 95
<b>Monthly</b>	45,000₩	55,000₩	65,000₩	80,000₩	95,000₩
<b>Voice</b>	200 Min	300 Min	400 Min	600 Min	1,000 Min
<b>SMS</b>	300	500	800	1,000	1,500
<b>Data</b>	100MB	200MB	500MB	1,000MB	2,000MB

[Table 6] Tariff for Smart Phone, SKT

	i-Slim	i-Light	i-Medium	i-Premium
<b>Monthly</b>	35,000₩	45,000₩	65,000₩	95,000₩
<b>Voice</b>	150 Min	200 Min	400 Min	800 Min
<b>SMS</b>	200	300	300	300
<b>Data</b>	100MB	500MB	1,000MB	3,000MB

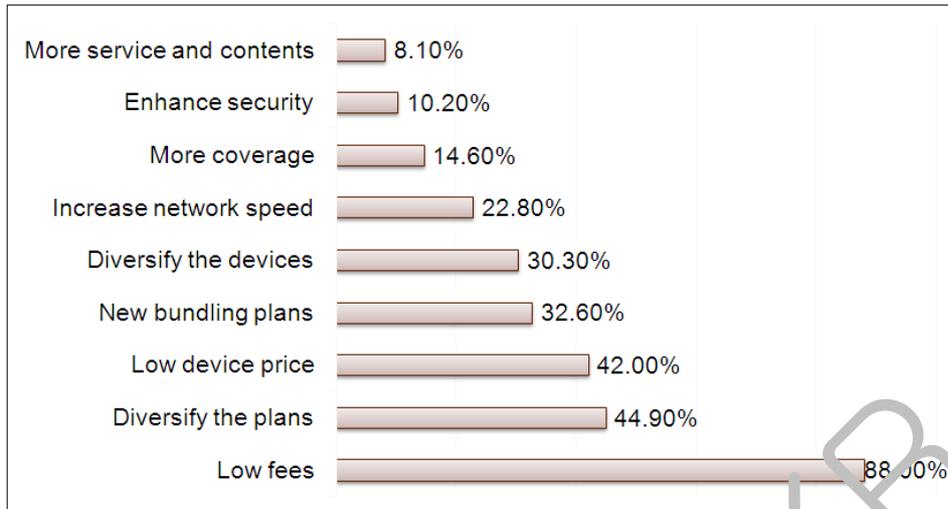
[Table 7] Tariff for iPhone, KT

## 5. Conclusion

Korea has been a leading country in ICT, but not in mobile. In addition, Korea has leading companies in mobile handset industry. However, the situation in wireless Internet is very different. WIPI was abolished since April, 2009. And with the entrance of iPhone and other foreign mobile phone, the competitions in network operators, handset makers and contents providers are increasing. In this flows, which factor, or what kind of activity can incubate the wireless Internet?

According to the survey from KISA, the people thought the high price is the barrier to

the use of wireless Internet.



[Figure 6] Important factor for active wireless Internet usage<sup>9)</sup>

In addition, Table 8 shows that the data tariff in Korea is very high comparing to those in other countries.

	Hutchison3	O2	Clearwire	AT&T	SKT	KTF
Fee	£15	£30	\$40	\$59.99		
	28,813W	57,626W	46,440W	69,648W	65,000W	65,000W
Data	15GB	10GB	2GB	Unlimited	500MB	1GB

[Table 8] Comparison of Data Tariff

More uses of wireless Internet may be required by the new investment to the equipment in the view of mobile network operators. However, it is clear that those movement is good for national welfare. It is the time for Korean MNO to move to the wireless Internet.

9) KISA, 2009

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