Study on Existing Third Generation (3G) Mobile Telecommunication Markets

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***Abstract*—**Since 3G mobile telecommunication markets have been developed in many areas around the world, learning their success factors or problems can be helpful for developing new markets like Iran. In this paper, according to the availability of data and different level of market development, some markets have been selected. First, Japanese and Korean markets, known as the most advanced 3G markets, have been considered, then, some European 3G markets which have gained new momentum like Italy and Germany, have been studied. Finally, some important notations which can be learned from this study, has been explained.

***Keywords*—** GSM Market, 3G, Third Generation, Market Study, Mobile Telecommunication Market.

I. Introduction

3G mobile communications systems, due to succeed to the present 2G such as the GSM, will be able to provide users with a large range of high throughput capacity multimedia services and applications. These new possibilities will be founded upon three main innovations:

- Broadband radio-frequency access allowing rates up to 2 Mbit/s;
- Intelligent network (IN) architecture allowing to create a single access mode to the services for the user whatever the network he uses, and to provide numerous supplementary services;
- Convergence between fixed and mobile networks (FMC) is in progress.

Considering the multimedia nature of the services envisaged, it is to be expected that alliances will be set up between the actors of several industries: telecommunications, computer and audio-visual industries [2].

For developing a new mobile service based on 3G a huge investment is required. Therefore, it is necessary to have a market study and understand what costumers need. In addition, it will be useful if we study some developed 3G mobile markets and draw their important success factors.

In doing this analysis, we take account of the experiences of a number of countries like Korea and Japan from Asia as two of the most leading countries, and then countries which gained new momentum in Europe like Italy and Germany. The experience of each country with respect to the mobile market is unique, due to diversity of factors. Nevertheless, the experiences also have much in common, and we can therefore draw a number of general conclusions.

We attempted, subject to data limitations, to look at some important factors related to the mobile market in each county. In particular, we examined factors like mobile users, mobile penetration and average revenue per user (ARPU) (for total market each).

II. Study 3G Mobile Telecommunication Markets

This section considers some 3G mobile Telecommunication markets to study the characteristic of each market, draw the status and finally learn their problems and success factors.

A. Asia Market

1) Japanese 3G market characteristics

Japan was the first market with a commercially launched 3G network and has seen a strong 3G take-up so far. However, the advent of 3G has triggered sharp competition [1].

- The shift to 3G has been mainly used by the carriers to alienate customers from one another.
- The aggressive strategy of KDDI has led to higher number of (high spending) subscribers and to a decline in the market share of DoCoMo and Vodafone.
- The belief that 3G helps to raise ARPU levels has found no sustainable evidence so far.
- Big price cuts to average per-unit transmission prices were introduced, but the development of applications that make use of extended 3G features has lagged.

TABLE I
Market in Japan

Market Dynamics Japan		*2002A*	*CAGR**	*2010E*
Mobile Users	[000]	73.447	+ 4.4%	113.903
Mobile Penetration	[%]	63		88
Consumer Subscriptions	[000]	75.476	+ 4.0%	103.067
Business Subscriptions	[000]	3.970	+ 10.0%	8.837
Non 3G Subscriptions	[000]	74.621	- 7.8%	39.095
3G Subscriptions	[000]	4.826	+ 40.4%	72.809
Share of Prepaid	[%]	1		3
Non 3G ARPU	[USD/month]	60.04	- 22.3%	10.18
3G ARPU	[USD/month]	126.25	- 8.1%	75.40

2) Korean 3G market characteristics

Korea is the world's most mature 3G market, based on the quick, easy and lower-cost technology evolution from CDMA One to CDMA 2000 [1].

- Korea is the world's first 3G centric mobile society.

- The big three mobile operators in Korea show oligopoly behavior, which seems to become more fragile.
- Fed by the content industry data revenue has been growing strongly in an environment of weak voice revenues.
- Flat data tariffs enhanced the take-up of mobile data.
- SK Telecom and KT Freetel have launched complementary W-CDMA networks in December 2003.

3) The market situation in Asia (Japan)

a. 3G Application
- 3G is used for faster data usage, it has not stimulated voice although the pricing is the same, messaging is not much higher on 3G than on 2G, no non-voice application stands out although data usage is going up
- Video services are limited by lack of content and reticence of broadcasters, self made video is even less popular than produced video due to compatibility problems and cultural issues
- CD quality downloadable ring tones have been the only successful 3G-like application "Chaku-uta"
- Full browsers together with flat-rate charges have been more successful as expected

TABLE II
MARKET IN KOREA

Market Dynamics Korea		2002A	CAGR*	2010E
Mobile Users	[000]	32.342	+ 4.9%	45.847
Mobile Penetration	[%]	68		92
Consumer Subscriptions	[000]	27.536	+ 4.9%	41.387
Business Subscriptions	[000]	1.509	+ 8.3%	3.064
Non 3G Subscriptions	[000]	15,764	- 40.8%	0.4
3G Subscriptions	[000]	16,528	+ 15.5%	45,447
Share of Prepaid	[%]	1		1
Non 3G ARPU	[USD/month]	31.87	- 18.7%	4.95
3G ARPU	[USD/month]	46.59	1.8%	54.55

b. Strategy
- Poor initial take-up was caused by the lack of attractive handsets and inadequate coverage. All operators have addressed this with rapid coverage extensions and initiatives to provide deep indoor coverage.
- Although launched in October 2001 the FOMA take-up started not earlier as December 2003 when the FOMA 900i series was introduced by NTT DoCoMo.
- Fierce competition has driven subsidies to 50-70%; 3.7x (FOMA) to 5.7x (Vodafone 2G) monthly ARPU.
- There is a trend to equip handsets with additional functions that do not use the cellular network at all. Since they do not generate any revenue, they are mainly used for recruiting and retaining subscribers

c. Revenues
- Revenues are falling and CAPEX is rising because usage growth is outstripping revenue growth due to the new flat data tariffs. (CAPEX/customer: DoCoMo 182 USD, KDDI 91 USD, VodafoneKK 150 USD)
- Driven by KDDI, customers demand a strength of coverage and high transmission speeds without being willing to contribute revenue. Additionally, they are getting better at arbitraging tariffs
- The flat rate data offers have eliminated some upside potential as data usage grows, and the advent of Mobile Number Portability in 2006 is expected to fuel churn further.
- Operators believe in an enormous data price elasticity, but voice prices elasticity is believed to be very low

d. Technology
- Only NTT DoCoMo offers WLAN services. All operators intend to follow their evolutionary technology path to offer higher bandwidth – NTT DoCoMo and Vodafone aim at HSDPA and KDDI relies on EV-DO Rev. A.
- Widespread deployment of W-CDMA with ubiquitous coverage may make it unnecessary for operators to deploy WLAN hot-spots, simplifying terminals and avoiding complex technology and service integration.
- No operator has announced the deployment of WiMax so far, leaving this opportunity to other market players.

B) Europe Market

1) German 3G market characteristics

Germany is the biggest European 3G market when the 3 group is not present. All operators launched their 3G offerings in 2004 but now the market is gaining momentum [1].

- After years of disappointment, the German 3G market now shows some encouraging growth.
- High license fees and regulatory coverage requirements caused huge capital expenditures.
- Although T-Mobile is the overall mobile market leader, Vodafone has taken the pole position in the 3G market.
- While voice ARPU is declining, data ARPU is growing, in particular from non-messaging applications.
- T-Mobile will launch HSDPA in Germany in March 2006.

TABLE III
MARKET IN GERMANY

Market Dynamics Germany		2002A	CAGR*	2010E
Mobile Users	[000]	52.907	+ 2.7%	67.388
Mobile Penetration	[%]	72		103
Consumer Subscriptions	[000]	50,419	+ 4.0%	71,865
Business Subscriptions	[000]	8,740	+ 5.0%	13,517
Non 3G Subscriptions	[000]	71.074**	- 2.8%	58.070
3G Subscriptions	[000]	268**	+ 33.6%	27.312
Share of Prepaid	[%]	38		52
Non 3G ARPU	[USD/month]	23.69	- 0.2%	23.34
3G ARPU	[USD/month]	62.50**	-2.1%	53.78

2) Italian 3G market characteristics

Italy is one of the most competitive European 3G market. Competition is fueled by the presence of the 3 group and a very large share of prepaid subscriptions [1].

- Besides UK, Italy is the most competitive 3G market in Europe.
- The overwhelming majority of mobile subscriptions are prepaid.
- In Italy the 3 group is present. While having an overall market share of 7%, H3G enjoys a market share of 71% of all 3G subscribers.
- Although the MoU in Italy are twice as high as e.g. in Germany the ARPU is in a comparable range.
- While the number of 3G subscribers is expected to show a healthy growth, the ARPU forecast exhibits slight erosion.

TABLE IV
MARKET IN ITALY

Market Dynamics Italy		2002A	CAGR*	2010E
Mobile Users	[000]	47.320	+ 2.7%	59.972
Mobile Penetration	[%]	90		125
Consumer Subscriptions	[000]	46,368	+ 3.8%	64,987
Business Subscriptions	[000]	5,684	+ 3.2%	7,579
Non 3G Subscriptions	[000]	55,269**	- 2.6%	42,638
3G Subscriptions	[000]	343**	+ 64.3%	29,928
Share of Prepaid	[%]	81		108
Non 3G ARPU	[USD/month]	32.03	- 16.2%	7.80
3G ARPU	[USD/month]	96.69	-1.6%	85.10

3) The market situation in Europe

a. How it has been started

i. A lot of European operators have had consumer oriented 3G services available for more than 6 months. Most of them have had enterprise 3G data card offerings for more than a year. But most of them have failed to migrate even 3% of their customer base to 3G.

ii. But 3G customer growth is beginning to accelerate due to increased handset availability and attractive trial offerings. All of Vodafone's major European operations now show 3G subscriber growth rates of more than 40%.

iii. The incumbent's performance has to be contrasted with that of new entrant H3G which offers extremely good value to high users.

b. Data

i. Although data cards targeting enterprise users were the first commercial 3G offering, sales of 3G handsets to consumers have quickly overtaken those of data cards.

ii. In Europe as a whole, phones account for more than 90% of all 3G connections. These figures are influenced by H3G's predominant focus on the consumer market.

iii. Operator's have started to launch prepaid 3G data cards (e.g. Vodafone UK). However, the addressable market for these devices is small and won't significantly increase the share of business connections.

c. 3G Application

Recent trends suggest that mobile TV and music is among the top 10 3G applications.

i. Date form H3G reveals that the data share of its global service revenue is increasing strongly, up from 15% in July 2004 to 21% in December.

ii. Furthermore, the European market shows the trend to encourage higher network usage through more transparent and attractive pricing.

iii. There is a growing consensus among operators that music and TV will form the cornerstone of consumer 3G services during the next 1 to 2 years.

d. Revenues

i. Although 3G data traffic is improving, the relationship between incremental traffic and incremental 3G ARPU and revenue is still unclear.

ii. Data from Vodafone Germany reveals that the same customers increased their non-messaging mobile data revenue by approximately 70% when they acquired a 3G phone.

iii. 3G captures an increasing share of service revenues. 3G accounts for only 2% of Vodafone Germany's terminals in use – but those users generate a disproportionately large 4% share of total revenue.

III. SUMMARY

Result of the above market study has been divided in two categories that can be helpful for future strategy planning of 3G mobile market developments.

A. Key Lessons Learned from Japanese and Korean Markets

- There is no successful 3G application so far.
- Handsets and coverage matter more than anything else.
- Industry revenues are falling.
- Strong W-CDMA deployments make the use of other broadband technologies obsolete

B. Lesson Learned from European Market

- Prepare for a slow start

- Consumer segment dominates market take-up
- Mobile TV and music fuel 3G usage
- 3G adoption leads to higher non-messaging data ARPU

ACKNOWLEDGMENT

The authors would like to thank Iran Telecommunication Research Centre (ITRC) for its financial and scientific support.

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