

# Readiness towards 3G: Antecedents of 3G Adoption and Deployment in Malaysia

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**Abstract.** 3G which simply means 3<sup>rd</sup> generation mobile communications technology has been widely discussed by many telecommunications service providers. It was launched by ITU (International Telecommunication Union) about 13 years ago. However, the adoption of this technology, perception of adoption and the true success of it in Malaysia could be somewhat over optimistic given the scenario in other nations around the globe. Reports from other nations tend to depict a rather slow progress for 3G. This paper will address issues of 3G deployment and adoption in Malaysia. An insight into critical factors to be considered for the deployment of 3G technology in Malaysia and experiences of other Asian and European countries will be used as a benchmark for understanding mitigating factors of 3G deployment. The term readiness refers to readiness in terms of cost to the service operators, cost to the users of this technology, technological barriers such as interoperability of standards, insufficiency of mobile services or content and deficiency of the laws.

## 1.0 WHAT IS 3G

The third generation (3G) services<sup>1</sup> combine high-speed mobile access with Internet Protocol (IP) based services. Since mobile cellular businesses rolled out in the early 1980s, the wireless technologies have evolved from one generation to another, with the 3G being superior as compared to the preceding ones. First generation (1G) mobile cellular networks employed analog technology. The second-generation (2G) later came in with the digital technology. Towards the end of 2002, the world has almost completed the transition from analog to digital cellular networks. 3G systems were introduced to the world when there is the need for faster speed, global compatibility and multimedia services.

This, however, does not mean fast mobile connection to the World Wide Web. It is an establishment to new ways to communicate, access information, conduct business, learn and be entertained. In a whole, 3G paved the way to cater for telecommunication service convergence. With access to any service anywhere, anytime, from one terminal, the barriers towards communication will ultimately be non-existent. Nevertheless, 3G did not solely focus on applications requiring high-speed data rates. It is about convenience and speed of access.

3G is designed with the functions to provide a wide range of market-focused applications, catering for instant or real-time multimedia communications, enabling

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<sup>1</sup> Introduction into 3G, Jan 12, 2003

global mobility and roaming as well as offering high-speed e-mail and Internet access. 3G enables users to transmit voice, data and even moving images. Besides that, 3G also allow transmission of large-scale data and moving contents photographed by digital cameras and videos. In order to effectively cater for these services, the data transmission speed need to be increased up to 144Kbps in a high-speed moving environment, 384Kbps in a low-speed moving environment and 2Mbps in a stationary environment. Nevertheless, the maximum speed of 2Mbps is expected to be possible only by year 2005. Consistent with the emerging trend of 3G mobile communication, a new business model has been developed. The boundaries between telecommunication and the applications of information technologies sectors are fast becoming indistinct. New business alliances among Wireless Application Providers (WAP) has created a positive impact on the price to end-users of 3G technology.

## 2.0 RELATED RESEARCH

On 31st July 2002, the Malaysian Communications and Multimedia Commission (MCMC) assigned two of the three available 3G spectrum blocks in Malaysia. It was no surprise the two successful bidders were Telekom Malaysia Bhd and the Maxis Communications subsidiary UMTS (Malaysia) Sdn Bhd. Malaysia has plans to introduce 3G services in 2005 and the government expects both these local telecommunication giants to at least put up a modest launching next year to create awareness and appreciation of the new mobile technology to the mass market.

In some Asian markets like Malaysia, customers have to get used to mobile data services first, and so far, GPRS usage has not been that strong. Malaysia's Maxis Communications, Taiwan's 3G Mobile Network and Singapore Telecom have said they are unsure if mobile users will embrace the technology. All three operators plan to launch 3G services in their markets in the first quarter of 2004. Taiwan's 3G Mobile Network and Singapore Telecom have said they are unsure if mobile users will embrace the technology. All three operators plan to launch 3G services in their markets in the first quarter of 2004. Maxis chief executive Jamaludin Ibrahim told *Reuters* that he would be cautious in launching 3G services, as initial subscriber demand would be slow. Mohd. Jafri Kudus, vice president and head of Celcom's mobile data division share the same view that demand has to be present before rolling out the services.

Like many countries, Malaysia is just beginning its move to the wireless Internet as the stepping stone to 3G. This doesn't mean that foreign partners will necessarily flock to Malaysia (even if they're invited). The sort of raunchy branding that Virgin has placed on its mobile offerings in recent times is unlikely to be a hit in Malaysia. But equally, Malaysia should be willing to learn some of the hard lessons that leading-edge countries like Korea have learnt over the last few years. Most of the basic drivers towards mobile Internet are just that - basic, and common to most people. For 3G to succeed in Malaysia, it will need local developers to take the lessons of successful services overseas and adapt them for the local context<sup>2</sup>.

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<sup>2</sup> Ovum View : 3G in Malaysia, September 18, 2002

### **3.0 Literature Review**

According to Gerald Kong (2003), the road ahead will be rocky. Managing the seamless progression of existing customers to the next generation of 3G service offerings will be crucial and the mobile industry will have to adopt a different business paradigm. Consumers will be driven away if they do not see value in the service - costs will have to commensurate the applications. In countries where the licensing process has been completed, the rollout of 3G services has been rather disappointing.

Market demand, handset availability and network inter-operability were among the contributing factors cited. Many countries, especially developing countries, have yet to license or deploy 3G networks, which is very costly. In the hindsight, this could prove to be a blessing. They have learned from the mistakes of the developed countries and develop strategies that benefit their own context, economically and technologically.

The literature survey also shows that there are still significant challenges in 3G network deployment. There are at least 2 main competing standards – W-CDMA and CDMA-2000 in the market. Network deployment is facing delay and financial trouble. Most of the network operators are not sure if users will embrace the technology.

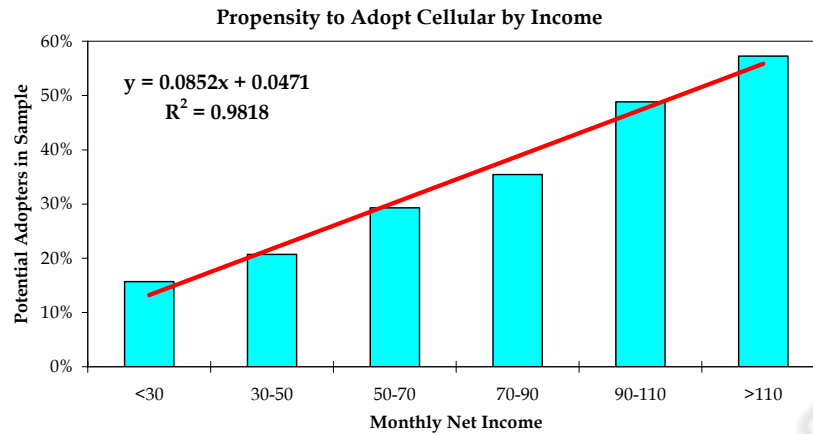
Even though some operators has started to deploy the 3G network or planning to deploy in 2004, most of them will proceed cautiously because they expect demand will be slow initially. There are predictions that demand will pick up only in 2005 or 2006 after handset technical glitches are resolved, prices become more appealing to customers and most applications are available.

### **4.0 Discussion and Findings**

#### **4.1 Readiness in terms of Cost – to the consumer**

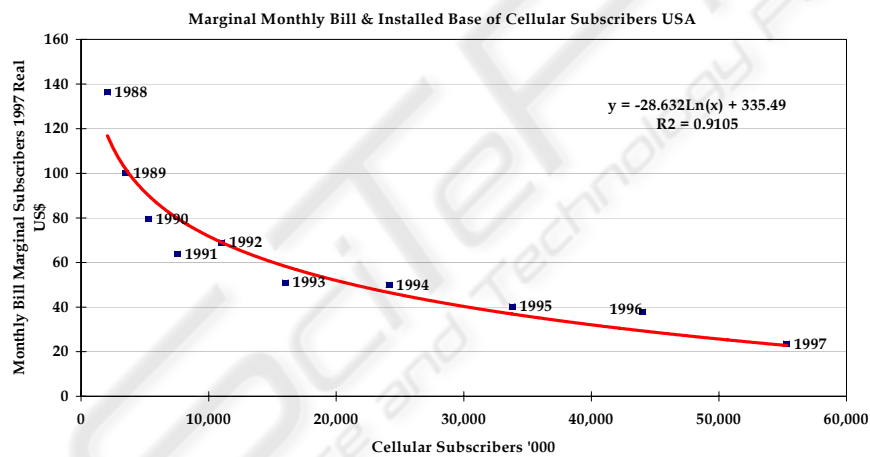
Customer behaviour anchored strongly in PC usage and easy availability of “free” or low cost services like Internet. Income influences the penetration level of mobile technology as well as the optimum combination of different generations of mobile phones.

High income allows potential adopters to afford higher prices while embracing an innovation (Dekimpe, Parker and Sarvary 2000). In an international context, it can be argued that an economy’s standard of living and the level of economic development influence the adoption timing as well as diffusion speed (Antonelli, 1993; Gatignon and Robertson, 1985; Dekimpe, Parker and Sarvary, 2000; Gruber and Verboven, 2001).



**Fig.1.**

The figure shows the correlation between propensity to adopt mobile and income. A sample of 1,500 interviews in a Far Eastern country, was done in 1996.. This shows that income does matter for using mobile services.



**Fig.2.**

The figure shows price elasticity of demand an empirical evidence. Demand is driven by the value proposition, minutes for an amount of money.

NOTE: PROPENSITY TO ADOPT CELLULAR SERVICES BY INCOME AND AVERAGE MONTHLY BILL.  
(SOURCE: Coleago Consulting Ltd , IBC Conference - Boston, MA - September 1999)

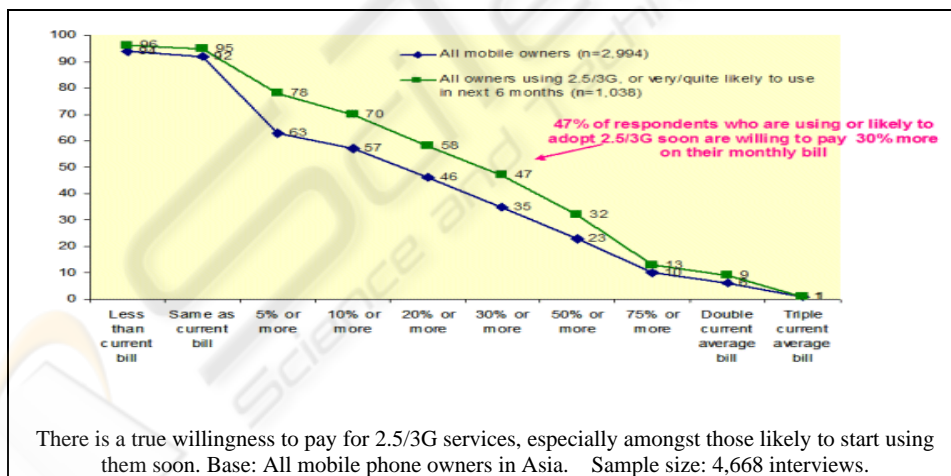
A certain minimum level of income is therefore a pre-requisite for effective penetration level of mobile technology. For example, third and fourth generation mobile phones are likely to be more attractive for high-income economies than for low-income economies. According to Research Company Taylor Nelson Sofres, in

Malaysia there is a clear disparity between acceptance level and high interest for 3G applications and services by mobile phone users, and the willingness to pay.

It seems very likely that for some years the 3G device will be too expensive for any but the higher end customer. Consumers do not care about the infrastructure technology. It is the availability and price of data-enabled handsets, useful applications, and premium content that will drive consumer demand, whatever underlying technology is used to provide it.

MMS messaging services had been estimated to be priced at RM 0.50 per message here in Malaysia. Given the elastic demand nature of Malaysians and users in other nations (figures above), pricing does matter for the adoption of 3G. The figure below indicates that users are willing to pay for the extra charges for this new technology. Around 78% of the respondents are willing to pay for a 5% increase in the total monthly bill, 70% are willing to pay for a 10% increase in the total monthly bill and 47% are willing to pay for a 30% increase in the total monthly bill.

SMS services in Malaysia currently are priced at RM 0.15 per message. Looking at the statistics below, one may be only willing to pay RM 0.195 per MMS message (30% increase). This shows how elastic the demand is in this region. However, if priced at RM 0.50 per MMS message the demand may shrink even further or there may be no demand at all as this constitutes to a 233% increase from a SMS message. Even if user are willing to pay, it will only be limited to a minority group of active users only. The case in Japan is not the same. Their demand is quite different and users are willing to pay up to 50% of the income for mobile services.



**FIG. 3.** THE FIGURE SHOWS WILLINGNESS TO PAY FOR 2.5/3G. (SOURCE: TNS ATI 2003)

The tables below show how perception of consumers in general toward 3G services in Paris, London and Berlin. Generally consumers all over the world somewhat have the same perception and concerns over new technologies and this can give us here in Malaysia some idea of 3G adoption.

#### 4.2 Readiness in terms of Cost – To the Operators

Cost is always the resource needed to roll out any new products. Especially for technology products, the cost of setting the infrastructure for 3G deployment could come up to several billion of dollars, some might end up with tens of billion. The 3G service is a key demand, and then comes the cost of new infrastructure for the deployment of the new technology. It is estimated that Malaysian companies would have to spend about RM3.8 billion to build required infrastructure such as trunk facilities, fiber optics, electronics, switching equipment, antenna, power and radio equipment for the development of new radio base station (RBS).

Apart from the infrastructure cost, the Malaysian companies would also have to deal with high implementation cost with the initial investment range between RM200 million to RM350 million. These do not include the cost of developing services and application, which is too overwhelming. The roll out of 3G is expected to cost in the region of RM8 billion over a 10-year period for both Telekom Malaysia and Maxis. The stakes are high for all parties concerned - and hence so are the risks involved. Further more, the cost of advertising through different media, will also incur substantially.

#### 4.3 EXORBITANT LICENSING FEES

3G license in Europe attracted a large number of criticisms because of the exorbitant price demanded. According to a recent survey, prices paid for licensing has been hefty. Telenor a company in Norway paid US\$11.2 million, Telecel in Portugal paid US\$90 million and diAx in Switzerland incurred US\$29 million.

**Table 1.** - License Fees Paid by Telecommunication Companies in Europe.

Countries	Successful Bidder	License Fees (US\$)
France	SFR	551 million (RM2.1 billion)
Germany	MobilCom	7.6 billion (RM28.9 billion)
Italy	Omnitel	2.03 billion (RM7.7 billion)
United Kingdom	Vodafone	9.4 billion (RM35.7 billion)

Source: Cellular-News, 2002

Due to the exorbitant prices of 3G licenses in Europe, the Malaysian Government has wisely decided to restrict the cost of 3G license to RM100 million for both spectrums, resulting in a cost of only RM7.05 per adult population in Malaysia. The cost of building a 3G infrastructure in Malaysia is expected to be in the region of RM8 billion for two Malaysian telecommunication companies in the next ten years.

Hypothetically, the cost of 3G to the average Malaysian populace is around RM351.72 (inclusive of the RM100 million license fees), with a cost of RM5 billion to install 3G networks throughout the major cities and towns in the country. With the average Malaysian mobile subscriber paying RM30 - RM60 in monthly access fees (this fee is waived for prepaid services), it will be a major challenge for the local telecommunication companies (namely Telekom Malaysia and Maxis) to push the cost of 3G deployments to end users. The fees however, are much lower than in the UK, Singapore and Australia (refer to Table 4 below).

**TABLE 2.** COMPARATIVE ESTIMATES OF 3G LICENSE COSTS.

COUNTRY	ESTIMATED ADULT POPULATION *	Cost of License	Cost per POPULATION
MALAYSIA	14.5 MILLION	RM100 MILLION FOR 2 LICENSES	RM7.05
SINGAPORE	3.5 MILLION	S\$300 MILLION FOR 3 LICENSES (RM648 MILLION)	RM185.15
AUSTRALIA	15.2 MILLION	A\$1.17 BILLION FOR 4 LICENSES (RM2.36 BILLION)	RM155.30
UNITED KINGDOM	48.2 MILLION	£22.5 BILLION FOR 5 LICENSES (RM135.9 BILLION)	RM2,819.50

\* ADULT POPULATION IS DEFINED AS POPULACE AGED 15 YEARS AND ABOVE.

SOURCE: CELLULAR-NEWS, 2002.

#### 4.4 Readiness in terms of Killer Applications

Despite all the hype and expectations over 3G technology, 3G contents and applications have not taken off at a rate comparable to the technology involved. This is rather surprising since the availability of content is a key factor to be considered in implementing 3G technology. Applications that are appealing to the current generation of 3G consumers, such as sending/receiving emails, taking pictures via a 3G phone and application contents are already supported by the existing 2.5G technology.

Many have asked, "why on earth launch a service that doesn't even exist in its first stage?" The 3G network is referred to as a video network, allowing users to send PICTURES OR video messaging and there seems to be many technological capabilities of 3G including integrating computer and communications functions in a single mobile device. However, without a complete countrywide network, this service is good for little else.

In addition, the presence of other competing technology such as WLAN's and WiFi hotspots and the lack of "killer application" will discourage consumer from using 3G and hinders its growth. The performance will not be the optimum because with 2 Mbps voice and data will be running in the same frequencies.

As such, development of 3G contents will need to introduce both contents and applications that are unable to be supported by the existing 2-2.5G mobile technology. There is no point in paying a premium for 3G technology when the current GSM technology is adequate to satisfy consumer demands. It would be another two to three years before 3-G services become fully affordable<sup>3</sup>.

Another potential stumbling block for 3G deployment is the absence of a single unifying standard. This has given rise to inter-operability issues amongst handsets manufacturers and network operators. The new 3G network has had many problems including its inability to provide adequate coverage and its lack of handsets out on the market.

#### **4.5 READINESS IN TERMS OF TECHNOLOGY, INFRASTRUCTURE AND STANDARDS**

##### **The Japan Experience**

Japan is a pioneer in the telecommunications industry and is well ahead of many other nations in the world today. The factors that have contributed to the success of Japan are important to us in Malaysia as well as other nations because it will definitely determine our fate of 3G. At this point no global standard has emerged yet in Japan. Two rival 3G technologies already confronted each other in Japan. NTT Docomo is using Wideband Code-Division Multiple Access (W-CDMA) technology while its rival KDDI launched a competing service using CDMA-2000 technology. CDMA-2000 is also favored in South Korea and USA. On the other hand, European mobile operators mostly back W-CDMA.

Standard division has created inter-operability issues for manufacturers of 3G handsets and network operators. This could potentially hamper the growth of 3G to provide accessibility anytime, anywhere. If this complication persist, the vision of "global roaming" is unlikely to be realised in the near future. We are already seeing different standards being adopted in some of the world important economies – the US, Europe, China and Japan. It is hoped that the drive for globalisation will eventually push these economies to find a way to integrate these standards or share their resources. Only then, a truly seamless and borderless communications can be achieved.

Though Europe's standards aren't as diversified as those in the US, the continent is facing a mix of GSM, GPRS and UMTS. According to Nancy Konish (2001), operators will have to run hybrid networks consisting of those three elements in order to implement 3G. Schema's UMTS OptiPlanners was created to relieve this burden. This is a network-planning product, which is aimed at enabling successful migration

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<sup>3</sup> Source: asia.cnet.com dated: 6/11/2001. The wait is still on.



and subsequent revenue generation, by facilitating the automatic optimisation of the radio frequencies environment.

By influencing system-wide parameters, such as antenna configuration and transition levels, Schema's UMTS OptiPlanners provides heightened performance capabilities. It also reduces the need for new infrastructure and engineering resources by using existing GSM site locations. With built in prediction capabilities, the tool can show details of the future network. It also points out potential weaknesses, like physical limitations and activity costs. To broaden its targets, Schema's UMTS OptiPlanners accommodate multi-vendor environments.

#### **4.6 Readiness in terms of Regulation**

Every technology is bound to be abused by the user. The readiness of Malaysia in terms of legal and regulatory framework is crucial for the successful deployment of 3G. As such the Communications and Multimedia Act 1998 and the Malaysian Communications and Multimedia Commission Act 1998, have created new provisions, policies and a regulatory environment.

This is for the development of new types of services such as provision of application services and provision of content application services that are technology neutral. The regulatory environment is also a less licensing environment with the introduction of industry forums to promote a self-regulatory environment.

E-Government and e-Commerce applications will only have wide usage if the general public has trust and confidence that their transactions are reliable, secured and that their personal information will not be misused. A number of policy initiatives currently being undertaken to address these issues are:

- Formulation of a national security policy framework
- Legislation to protect personal information
- Promoting the positive use of the Internet
- Harmonising current laws to facilitate new ways of transacting through the electronic media

Cyber laws that the Malaysian Government has already approved and passed are:

- Digital Signature Act 1997
- Computer Crimes Act 1997
- Telemedicine Act 1997
- Communications and Multimedia Act 1998

## 5.0 Conclusion

Despite all the setbacks and problems faced by 3G, we believe the time for 3G will come. It certainly has major role to play in the move towards the next level of wireless technology in Malaysia. Maybe the current disappointment stems from the hypes that have been overly played or marketed by various quarters, analysts or even telecommunication companies themselves. One thing for sure is that success for 3G in Malaysia will not come overnight.

History has taught us that other mobile technologies have taken some time to actually prosper and gain consumer acceptance. 2G or GSM took about 10 years to mature and become widely accepted. There will be no exception for 3G. Success will again call for the tremendous efforts and co-operation between stakeholders, governments, network operators, contents and devices vendors, and consumers. All is not lost in the midst of the criticisms, setbacks and depressed outlooks. The pieces are falling into place, slowly but surely.

In trying to answer this question of, 'Is Malaysia ready for 3G?', we would need to see if there is indeed a compelling reason for Malaysia's initiative in this arena. Because, if it is important for Malaysia to move into the next wave, then the more appropriate question should be "How" rather than "Are we ready".

In other words, we need to look from the perspective of what the different players in the saga would need to do to make 3G a viable and sustainable technology in Malaysia. Also, in answering these questions, we need to look at who are the important 'players' in this saga, and evaluate each players' readiness, as well as highlight some of the best practices of other successful mobile operators. Malaysia being a follower in this arena, there are lessons that we can learn from the first movers.

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