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Seamless Access in Asia Pacific: Opportunities and Challenges

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Abstract: - One of the factors driving the technological revolution in wireless communications and Internet access is the unbridled global demand for voice, video, and data services. Changes from an industrial to an informational based society and the associated demand for enhanced communications services push the need for seamless access further. Currently, the domestic telecom service market is divided between fixed-line and mobile providers. As such, not only networks, but also operators and services are evidently divided into two markets. To meet the challenges of fixed-mobile convergence (FMC), carriers will have to radically rethink their approaches to new products and services development. They will need to create a varied portfolio of products and services and the ability to bring these to markets in weeks rather than months to gain competitive advantages. This study discusses the opportunities to exploit in Asia Pacific region in respect to FMC services deployment. It also addresses challenges faced by the key players in Asia Pacific region. In short, it is aimed to provide an extensive study on the opportunities and challenges that could be used to derive architecture for key players in the industry to outline suitable approaches to encourage mass market diffusion of FMC services in Asia Pacific.

Key-Words: - seamless access, fixed-mobile convergence, opportunities, challenges, diffusion

1 Introduction

One of the factors driving the technological revolution in wireless communications and Internet access is the unbridled global demand for voice, video, and data services [1]. Changes from an industrial to an informational based society and the associated demand for enhanced communications services push the need for seamless access further.

Wireless is the technology of choice for providing telecommunications services in underdeveloped countries, impoverished cities, and remote rural villages [1]. The need for field service, sales, dispatch and other mobile workers' critical need to access product, pricing, and customer information located on corporate intranets gives rise to the necessity to deploy WLAN and BWA solutions.

Currently, the domestic telecom service market is divided between fixed-line and mobile providers. As such, not only networks, but also operators and services are evidently divided into two markets [2]. These result in inconveniences for users, who have to subscribe to different providers, pay two bills, and use two different handsets if they want to utilise both fixed and mobile telecom service [2]. On top of these, fixed-line services and wireless services are offered via separate terminals [2]. The merits of FMC become clear when both fixed and wireless services can be accessed at the same time via a single terminal, and users only receive one bill from a single telecom operator [2].

Accenture defines FMC as any service or customer experience that leaves the customer agnostic as to the underlying technology providing it [3]. For many service providers, FMC implies seamless integration of mobile and fixed voice telephony networks [3]. Figure 1 shows various layers of seamless access.

To summarise, seamless access has the following requirements (but are not limited to):

- Seamless network integration based on IP
- Terminal mobility, personal mobility, service mobility and session mobility
- Dynamic resource allocation at all network and system levels
- Adaptability and programmability of network components
- Secure but simple service agreements SIM-card like universal authentication

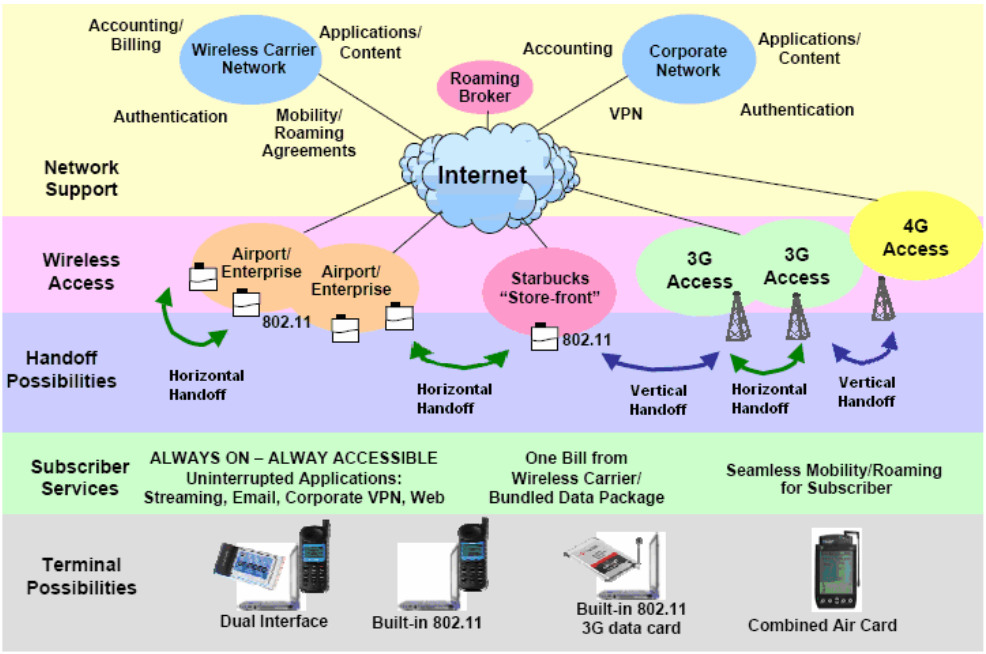

Fig. 1: Seamless Access

To meet the challenges of FMC, carriers will have to radically rethink their approaches to new products and services development [3]. They will need to create a varied portfolio of products and services and the ability to bring these to markets in weeks rather than months to gain competitive advantages [3].

These portfolios will need to be highly flexible and adaptable, as it is difficult to predict which will be the killing applications in this new market. Figure 2 shows the new business model for fixed mobile convergence.

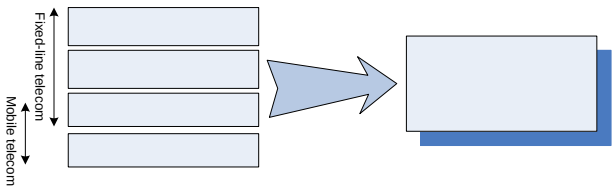

Fig. 2: Telecom Services Offered as a Single Service [2]

In addition, IP Multimedia Subsystem (IMS) could have a major role to play in the future delivery of multimedia services over fixed and mobile networks [4]. Vendors claim that IMS will bring diverse benefits for network operators, but hype and lack of clarity make it difficult for operators to identify the most significant short and long term gains, and to define a robust strategy for deployment of IMS [4].

2 Fixed-line and Mobile Market in Asia Pacific

Fixed-line subscriber growth rate is projected to lag behind cellular growth for the next few years. This is particularly evident in developing markets where cellular penetration rate can grow up to three times the pace of fixed-line subscriptions. For instance, cellular market is predicted to grow at a compound annual growth rate (CAGR) of 61 percent in India and 33 percent in China for the forecast period ending 2006 [5]. In contrast, fixed-line subscriptions are expected to grow at 19 percent in India and 17 percent in China [5].

Cellular market exceeded fixed-line market in China in 2004 and is expected to account for half the fixed-line subscriber base in India by 2006 [5]. Cellular market growth rate is also faster in the developed markets in Asia Pacific. For example, cellular market growth in Australia will be 9 percent while fixed-line growth will be a mere 2 percent in 2006 [5].

Table 1 shows that the gap between cellular and fixed-line subscriber number will continue to widen. In the Philippines, the cellular subscriber base was already double the amount of the number of fixed-line subscribers in 2000, and this is expected to rise to a gap of four times in 2006. By 2006, cellular subscribers will exceed number of fixed-line subscribers by 1.7 times in Japan and South Korea, 1.6 times in Hong Kong and 1.3 times in Australia [6]. Overall, except for India, all markets in Asia Pacific region will have more cellular subscribers

than fixed-line subscribers by 2006 [6].

Table 1: Asia Pacific (Selected Countries) Fixed-line vs. Mobile Subscribers (Millions) [6]

	2004	2005	2006	2007
Hong Kong				
Cellular Connections	6,093.9	6,191.0	6,281.0	6,494.6
Fixed Lines	3,961.1	3,971.2	3,979.9	3,983.9
Malaysia				
Cellular Connections	11,218.0	11,685.0	12,083.0	14,052.5
Fixed Lines	5,131.3	5,396.8	5,742.2	5,920.2
Philippines				
Cellular Connections	19,226.1	20,864.9	21,860.2	27,762.5
Fixed Lines	4,184.4	4,745.6	5,442.2	5,942.9
Singapore				
Cellular Connections	3,610.1	3,750.5	3,855.0	4,202.0
Fixed Lines	2,067.2	2,116.8	2,169.7	2,208.8
Thailand				
Cellular Connections	26,584.7	28,055.0	29,207.6	36,509.5
Fixed Lines	10,263.3	11,658.7	13,276.0	15,134.6

Referring to Figure 3, the global mobile population consequently totalled over a billion mobile subscribers (1125.3 million by the end of 2002, with the billionth subscriber reported during the second quarter of 2002) and increased by around 18 percent in the year 2002, versus nearly 30 percent in the previous year [7]. This slowdown can be attributed to markets in Western Europe and North America.

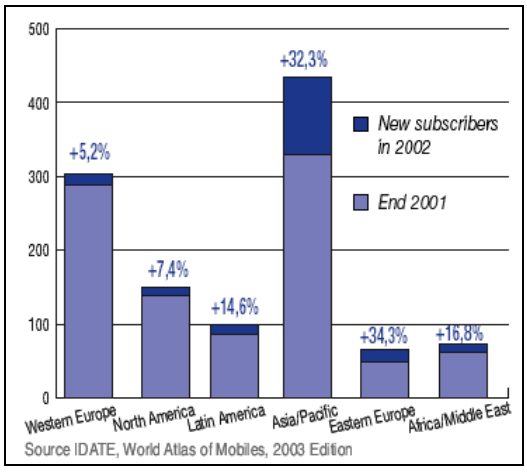

Figure 3: Worldwide Mobile Subscribers in Millions [7]

Asia Pacific confirmed its position as the main reservoir in the mobile market in the mid-term, through an increase in its total population of prepaid subscribers [7]. The region, which accounted for 38.7 percent of the global mobile subscriber base at the end of 2002, again showed very steady growth [7].

China overcame the United States to be known as the world's largest market for mobile phones a few years ago, but the growth in Indonesia has been equally stunning [8]. Over 20 million Indonesians now own mobile phones, roughly about 8 percent of the countries 220 million population as of October 2005 [8]. Asia Pacific Research Group (APRG) [8] expects the country to reach 60 million subscribers by 2007. Foreign expertise, capital and technology are sought to make this still underdeveloped mobile economy competitive [8]. Singapore, Chinese and Korean telecommunications companies have made strong inroads already [8].

However, the challenge for the industry arises because most people in emerging markets have different needs and financial circumstances compared with those markets where mobile phone usage is high. For example, the typical average revenue per user (ARPU) in China is around US$5 per month compared with Germany at US$40 per month [9].

Therefore, it is clear that if the industry is to add another billion subscribers, then mobile equipment vendors and operators are going to have to find a way to make money on monthly revenues that run at between US$5 – US$10 in the world's low spending markets, particularly in Asia Pacific region [9].

Figure 4 shows the breakdown of broadband technologies in Asia Pacific region. Ovum has carried out in-depth consultancy work into the business case for FTTX (Fiber to the X or Fiber-to-the-whatever technologies) markets in Asia Pacific and predicts that by 2008, fibre to the building, cable modems and broadband fixed wireless access will each have a significant portion of the access market in Asia Pacific [10].

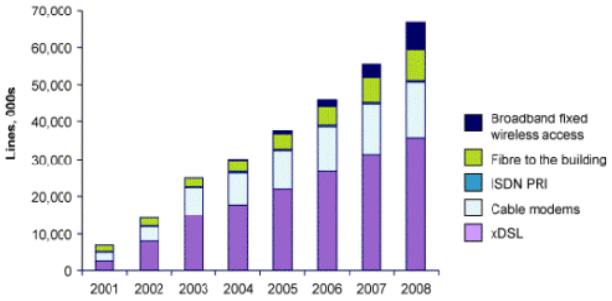

Figure 4: Broadband Technologies in Asia Pacific [10]

Globally, FTTX is still under trial and evaluation [10]. Sweden and Italy have seen commercial rollout, with e-Biscom in Italy taking market share from incumbents [10].

In Asia Pacific, the potential for FTTX will differ based on local market conditions. Early adoption is in markets where there is high urban density. For example, Korea, Japan, Hong Kong and Singapore all have a high proportion of multi-tenant units which can be easily equipped with fibre connections [10]. In Korea, for example, the majority of consumer access fibre networks are FTTB - known in South Korea as fibre to the curb (FTTC) [10]. The final customer connection is ADSL, so while the service is simply marketed as DSL there is relatively high fibre penetration in the access network [10].

3 Business Models

Similar to other emerging industries, FMC is characterised by a continuously changing and complex environment, which creates important uncertainties at the levels of technology, demand and strategy [11].

Taking customers' perspective offers a broader range of convergence opportunities. Despite the wide disparity in the cost of mobile and fixed minutes, many consumers prefer the convenience and usability of their mobile phones [3]. The recent rise in broadband adoption has also created a demand for convergence in the opposite direction [3]. Consumers want to see the new services they receive at home or office to be replicated on the move, with devices such as Blackberry, which allow mobile access to e-mail, address book and calendar [3].

Convergence opportunities need not only rely on network convergence. This can be as simple as offering customers a single billing plan or replicating functionality across devices [3]. Wireless technologies also provide the opportunity to bring together a wide group of devices than the fixed and mobile phones. Full convergence of the user experience and product functionality may be attained this way even before the underlying convergence and integration is fully realised at the network level [3]. For example, referring to Figure 5, as user moves from point A to point B, he may access a range of services on his mobile device, including checking e-mails, downloading video clips, accessing location-based information and checking his schedule for the day. He may not be aware that he is switching from 3G to Wi-Fi and to WiMAX networks while he is on the move. This scenario shows convergence at network, service, and technology levels.

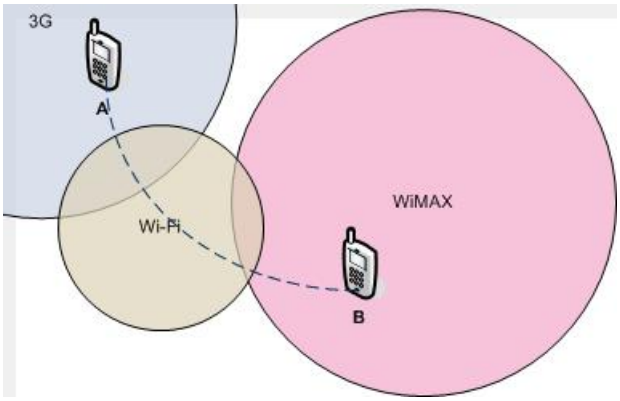

Figure 5: Fixed-mobile Convergence

Convergence at the services level is already happening. Currently, users may use a phone to watch television, listen to the radio, send short messages, chat via instant messaging, play games, browse the Internet, access location-based services or directories; for video conferencing purposes and so forth – all in one handset.

GSM-evolved networks will be integrated with WLANs (Wireless Local Area Network), PANs (Personal Area Network), BANs (Body Area Network), and other wireless technologies to form ubiquitous all-IP environment. In a converged world, an extended personalisation concept is required. Mass customisation to cater for the needs of each individual enables one-to-one effective marketing [12].

A further development of distributed personalised service architecture is required. The aspects covered include user preferences, location, time, network, and terminal have to be integrated and the relationship between these aspects must be taken into consideration to design business models. Next-generation handsets are capable of a combination of services available on PDA (Personal Digital Assistant), mobile phone, radio, television, and even remote control. This means that various market segments will emerge for the use of FMC services and applications.

When multimedia becomes inevitable, the need for guaranteeing certain levels of Quality of Service (QoS) becomes imminent. In mobile environment where users on the move tend to change networks more frequently, QoS guarantees will lead to the need for dynamic personalisation (e.g. content tailoring) on network and service level. On top of this, the optimisation of content for a given geographical market is a necessity for making any given application a success [13]. This means that personalisation can be achieved by offering location-dependent information to users on the move.

Convergence at the terminal level is also

happening. The handsets of the future will be more powerful, less heavy, and comprise new interfaces to the users and to new networks [14]. Nonetheless, the more features built into a device, the more power it requires. As a result, the higher the performance of the device, the faster it drains the batteries.

In spite of the rapid development of mobile computing, the mobile devices exhibit some serious drawbacks compared to desktop systems in addition to the high power consumption [14]. Interfaces have to appear small enough to make the device portable. Thus, smaller keyboards or hand scribing are used, which are frequently difficult to use for typing due to their limited key size, or current limitations of hand scribing recognition [14]. Furthermore, small displays offer limited capabilities for high quality graphical display. Therefore, these devices have to use new ways of interacting with a user, such as, voice recognition and touch sensitive displays [15].

In short, collaboration between key players in the FMC industry is required to successfully push FMC services for mass market adoption (see Figure 6).

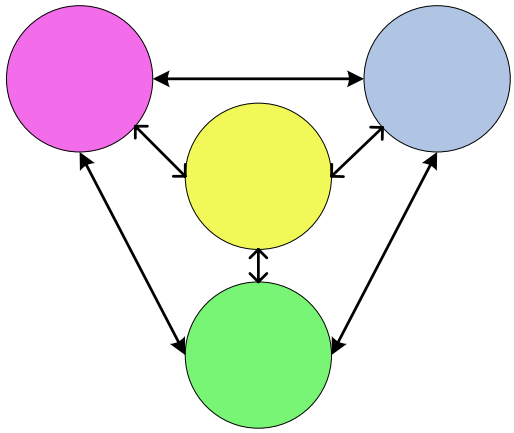

Figure 6: Fixed-mobile Convergence Stakeholders

4 Conclusions

The advent of FMC has ushered in a good deal of confusion around the appropriate business models for the new services. By breaking down FMC into services, networks and terminals levels, opportunities and challenges of each layer can be studied thoroughly. Based on these evolutionary pathways, players in the FMC industry must work together to deliver services to end users. This paper deals with a timely issue and provides an overview of the current state of fixed-line and mobile markets in Asia Pacific region. The research also includes suggestions on how the key stakeholders in the industry can collaborate to deploy and encourage mass market diffusion of FMC services in Asia Pacific region.

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