BUSINESS MODEL ANALYSIS OF SEAMLESS ACCESS IN SOUTH EAST ASIA

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Abstract: Fixed mobile convergence (FMC) will be one of the strongest trends in telecommunications in the near future. Given the choice, most consumers would want to use a single handset yet do not want to pay the premium when at home or in the office. Even though seamless network integration will still take some time to become reality, there are many convergence opportunities that are currently being exploited. Only by truly reflecting customer needs with a broad and flexible portfolio of products and services that shield customers from underlying network technologies can players in the industry meet the challenge and promise of convergence. This paper aims to discuss business models to aid in addressing one of the most common issues facing executives: aligning IT with the business. This study analyses business models to examine FMC from multiple perspectives to understand how carrier differentiates its product offerings, acquires and keeps customers, positions itself in the competitive market as well as captures profit. The paper reports the findings on the evolutionary processes towards FMC development that could be used to derive architecture to serve as a guide for players in the industry and to outline suitable approaches to encourage mass market adoption of FMC services in South East Asia.

1 INTRODUCTION

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 (Lee & Han, 2005). 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 (Lee & Han, 2005). On top of these, fixed-line services and wireless services are offered via separate terminals (Lee & Han, 2005). 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 (Lee & Han, 2005).

Although seamless network integration will still take some time to become reality, there are many convergence opportunities that are currently being exploited. Only by truly reflecting customer needs with a broad and flexible portfolio of products and services that shield customers from underlying network technologies can players in the industry

meet the challenge and promise of convergence (Costello & Knott, 2005). FMC has started to take shape: prototypical services for enterprise and home users are in place in the developed markets of Europe, North America and Asia; the launch of bundled services and voice over IP (VoIP) over wireless local area network (WLAN), as well as industry consolidation and integration of networks and platforms around Internet Protocol (IP) – are all pointing towards convergence.

Accenture defines FMC as any service or customer experience that leaves the customer agnostic as to the underlying technology providing it (Costello & Knott, 2005). For many service providers, FMC implies seamless integration of mobile and fixed voice telephony networks (Costello & Knott, 2005). According to Costello and Knott (2005), this highly network-centric view defines a future that may occur in the next five years, but omits a broad range of other convergence opportunities that are happening either now or in the near future. Referring to Figure 1, sooner or later, when users not only can seamlessly roam between local and wide area networks but also carry services

such as address books, video watching, voice mail and customer service capabilities with them, the final objective of FMC will be reached (Costello & Knott, 2005).
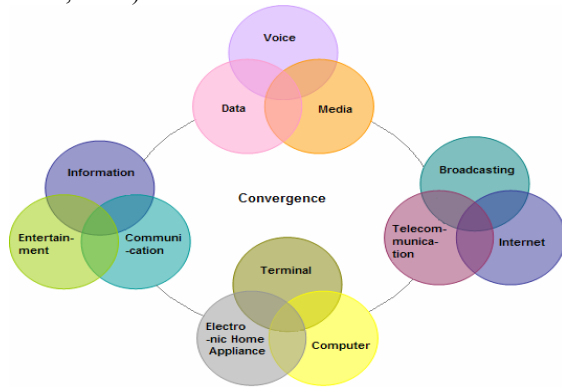

Figure 1: Convergence Model (*extracted from* Lee & Han, 2005).

By taking customers' perspective into account, a wider range of convergence opportunities emerges that are much nearer at hand than the long-term goal of a seamless network (Costello & Knott, 2005). FMC will result in field collapse of services, expansion and deepening of competitive boundary, and change of value-creation element as shown in Table 1 (Lee & Han, 2005).

These changes need to be taken into account when analysing business models to enable carriers to look at the full breadth of their ability to meet customers' demand for new experiences. Creating the breadth of portfolio, features, and functionality to achieve it will require an equally wide range of commercial and business models (Costello & Knott, 2005). Acquisition and merger is one possible route, while the creation of alliance, partnerships, and virtual network operator relationships are the other possible ways (Costello & Knott, 2005).

Table 1: The Effect of Convergence (*extracted from* Lee & Han, 2005).

Field collapse of services	• The change of value chain • The change of service value system • Ambiguity of fixed business
Expansion and deepening of competitive boundary	• Competition expansion in same industry • Potential competition among different industry • Strategic alliance expansion
Change of value-creation element	• The diversity of demand such as entertainment, communication, and information • Seamless and ubiquitous service

To meet the challenges of FMC, carriers will have to radically rethink their approaches to new products and services development (Costello & Knott, 2005). 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 (Costello & Knott, 2005). These portfolios will need to be highly flexible and adaptable, as it is difficult to predict which will be the killing applications in this market.

2 CURRENT TRENDS AND GROWTH

2.1 Fixed-Line Market

Not all Asia Pacific markets have the high fixed-line penetration of Western Europe. Countries such as Thailand and Philippines have fixed-line penetration rates of less than 15 percent, well below the average of 51 percent in Western Europe as of 2004 (Swift & Wilson, 2004). In these markets, mobile is already the dominant voice carrier. The drivers and timeline for FMC in South East Asia are a little different compared to Europe and America.
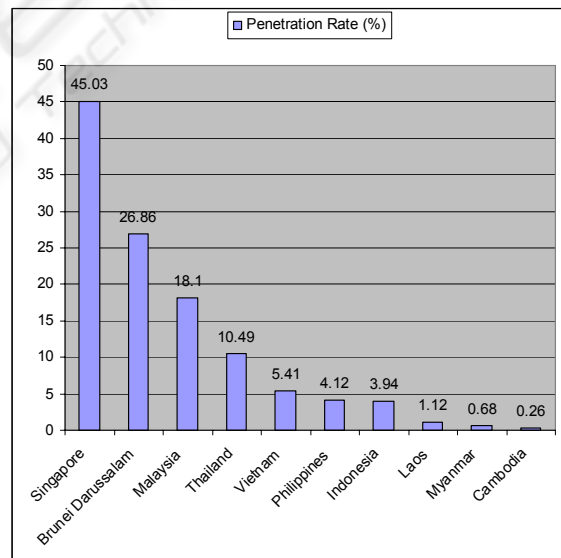

Figure 2: Main Telephone Lines per 100 Inhabitants, South East Asian Countries, 2003 (*extracted from* MCMC, 2005b).

Referring to Figure 2, apart from Singapore, all the other countries in South East Asia have main telephone lines per 100 inhabitants of less than 30 percent. Malaysia stands at 18.1 percent as of 2003.

Without fixed-line infrastructure, FMC is not a side-scale option for most developing markets at present (Swift & Wilson, 2004). The deployment of broadband infrastructure will determine the time and scale for FMC (Swift & Wilson, 2004). Unlike in Europe and America, the rollout of broadband is crucial for the introduction of FMC due to the very low fixed-line penetration rate (Swift & Wilson, 2004). Increasing broadband penetration will create a VoIP revolution, decreasing the price of voice and creating a mobile premium (Swift & Wilson, 2004). Once this has occurred, FMC will become an attractive proposition for both operators and consumers in South East Asia.

Internet access options in South East Asia are generally fragmented. For example, the telecommunications and information infrastructure in the Philippines is still relatively underdeveloped and largely concentrated in metropolitan areas (Lallana, 2003). Low personal computer penetration, relatively high Internet access costs and bandwidth limitations have slowed down the adoption of the Internet for higher-end uses in Philippines (Lallana, 2003). In 2003, personal computer penetration in Philippines is estimated at 1.9 for every 100 persons; Internet penetration is at 6 for every 100 persons (or 4.5 million of the total 76.5 million Filipinos) (Lallana, 2003). Of these Internet users, 3.1 million (about 70 percent) are said to access the Internet using prepaid cards at Internet cafés (Lallana, 2003). The Philippine archipelago is made up of 7,107 islands and this makes connecting residents on all islands via cable a cumbersome and expensive task.

In Malaysia, there are 353,978 broadband subscribers (penetration rate of 1.35 percent) and around 10,710,000 Internet dial-up subscribers (penetration rate of 13.7 percent) as of the second quarter of 2005 (MCMC, 2005b). Statistics indicate that as of the end of second quarter in 2002, there were 2.3 million Internet subscribers in the country, with the number of users being almost 7 million (MCMC, 2005b). In comparison, in 1997, just 5 years earlier, the figures were a mere 0.2 million and 0.6 million respectively (MCMC, 2005b).

While the figures may seem impressive, it is important to take note that similar official statistics indicate that the digital divide in Malaysia is still very wide. For example, 34.2 percent of the residents in Kuala Lumpur are Internet dial-up users while only 4.2 percent of the residents in Sabah are Internet dial-up users as of the first quarter in 2005 (MCMC, 2005b). 79.2 percent of the population in Kuala Lumpur use cellular phones while only 26.7 percent of the population in Sabah use cellular phones (MCMC, 2005b).

While deployment of broadband infrastructure in underdeveloped areas ensures that the population residing in these areas are always connected, it has been argued that these residents may not even have the need to get connected. Therefore, the cultivation of access to personalised information anywhere and anytime is also seen as an important driver affecting the diffusion of FMC solutions.

South East Asian countries with minimal fixed-line penetration and without a push towards broadband infrastructure rollout are a different prospect for FMC services. FMC will most likely come in the form of bundling bills and "home-zone" tariff for mobiles (Swift & Wilson, 2004). Operators, driven by fiercely competitive market conditions, will utilise these forms of FMC as a means of differentiation (Swift & Wilson, 2004). FMC handsets will not appeal in underdeveloped markets until the rollout of broadband infrastructure makes it a feasible solution (Swift & Wilson, 2004).

2.2 Mobile Market

On the other end, high penetration rate of mobile devices in a particular country indicates that the consumers are either always on the move or reside in remote areas. These consumers may require specific services to suit their needs.

Figure 3 shows that mobile phone penetration rate in South East Asian countries is generally higher compared to fixed-line penetration rate. The mobile market in Malaysia continues to grow increasingly competitive. Declining Average Revenue per User (ARPU) are forcing telcos to seek other means of profits. Value-added mobile data services were expected to foster industry growth.

According to studies conducted by Malaysian Communications and Multimedia Commission (MCMC) by the end of 2004, there were 14,455,000 mobile subscribers in Malaysia. This makes up penetration rate of 55.9 percent, making it the second highest in Asia after Singapore (MCMC, 2005a). Whether FMC services will take off in the local marketplace and when this will happen depend very much on the interaction between cellular operators and other parties to offer FMC services. Whether appropriate applications can be developed and whether these are introduced via the appropriate marketing mix become crucial (IDC, 2003). Low personal computer penetration that hinders access to the Internet via desktop, together with a high level of interest in new mobile technologies among the Asian

youth, combine to create an immense opportunity for FMC services in Malaysia (Lee, 2002).
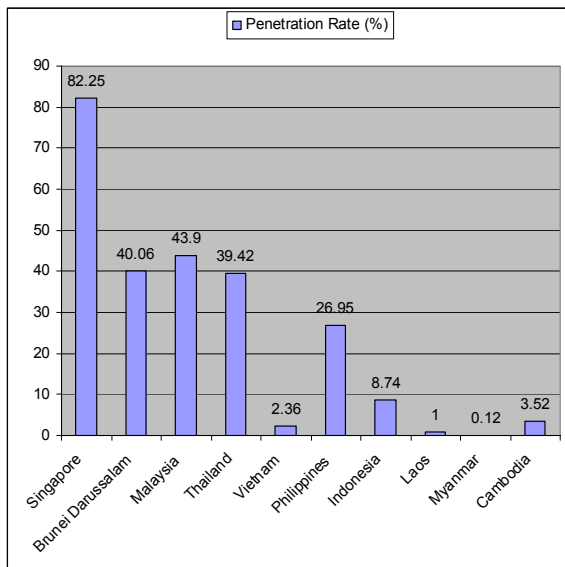

Figure 3: Cellular Phones per 100 Inhabitants, South East Asian Countries, 2003 (*extracted from* MCMC, 2005b).

3 BUSINESS MODELS

Similar to other emerging industries, FMC is characterised by a continuously changing and complex environment, which creates uncertainties at technology, demand and strategy levels (Porter, 1980). Porter (1980) asserts that it is possible to generalise about processes that drive industry evolution, though their speed and direction vary. According to Ollila *et al*. (2003), these processes are of dissimilar types and are associated to:

- Market behaviour
- Industry innovation
- Cost changes
- Uncertainty reduction
- External forces, such as Government policy and structural change in adjacent industries

Each evolutionary process recognises strategic key issues for the companies within the industry and their effects are usually illustrated as either positive or negative from an industry development perspective. For example, uncertainty reduction is an evolutionary process that leads to an increased adoption of successful strategies among companies and the entry of new types of companies into the industry. Both of these effects are considered to

contribute to industry development with regards to the FMC value web. The technological uncertainties are typically caused by rapid technological development and the battles for establishing standards, which are typical in the beginning stages of the life cycle of a particular industry due to a technological innovation (Camponovo, 2002). Concerning demand, despite the generalised consensus about the huge potential of FMC, there are many uncertainties about what services will be developed, whether the users are willing to pay for them and the level and time frame of their adoption (Camponovo, 2002).

Finally, strategic uncertainties are a common situation in emerging industries (Porter, 1980). A clear framework is required in order to permit players within the FMC value web to concentrate on the most critical part of their businesses and prevent them from repeating the costly mistakes of the recent past by entering, and subsequently exiting, non-core businesses and markets.
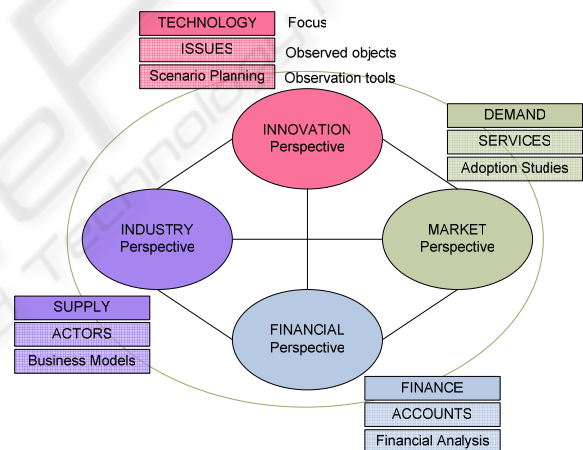

Figure 4: FMC Market Framework (*extracted from* Camponovo & Pigneur, 2003).

Based on these observations, a FMC framework (see Figure 4) has been inspired by the works of mobile market scorecard framework (Camponovo & Pigneur, 2003). The objective in this paper is to conceive a stakeholders' map for FMC industry. The underlying idea is that by taking viewpoints from different complementary perspectives and putting them all together, one can better understand the stakeholders and processes involved in the industry.
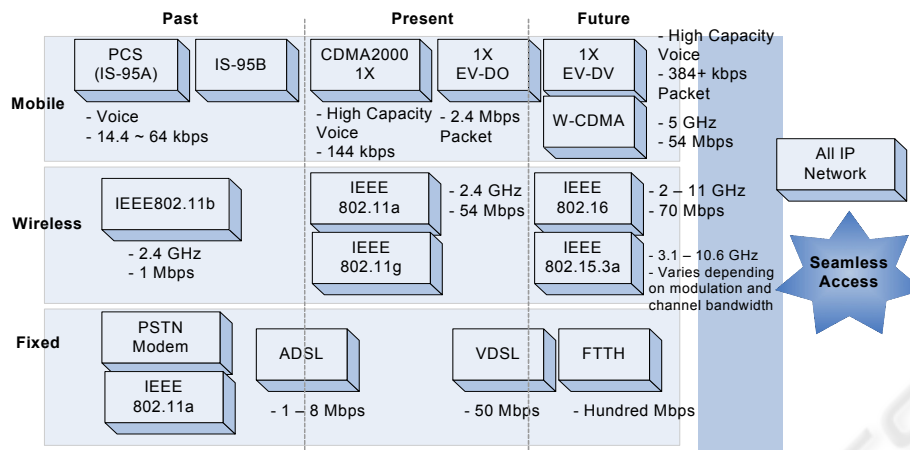
Figure 5: The Development of Network (*adapted from* Lee & Han, 2005).

4 CONVERGENCE DIRECTION ANALYSIS

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 (Costello & Knott, 2005). The recent rise in broadband adoption has also created a demand for convergence in the opposite direction (Costello & Knott, 2005). 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 (Costello & Knott, 2005).

The trend of fixed-line customers substituting VoIP minutes for fixed-line minutes continues in spite of unresolved issues around emergency calls and dial-tone access (Costello & Knott, 2005). A research conducted by Accenture's Communications Industry Group shows that it is the entire VoIP user interface, with integration of telephone with chat and address book capabilities, is the draw for customers (Costello & Knott, 2005).

According to a study conducted by Ovum, VoIP will drive the development of FMC (Swift & Wilson, 2004). Converged IP platforms in the enterprise space and the growth of broadband will facilitate the rapid emergence of VoIP (Swift & Wilson, 2004). Ovum expects that VoIP will speedily become the voice carriage standard for corporate with IP-VPNs and an increasingly common value-added offering for broadband services (Swift & Wilson, 2004). This will put pressure on fixed voice charges, increasing the premium for mobile services, and further eroding PSTN revenue (Swift & Wilson, 2004).

Despite the release of first-generation Bluetooth and Wi-Fi handheld devices, issues such as battery lifespan and hand-over require further refinement (Swift & Wilson, 2004). However, 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 (Costello & Knott, 2005). Wireless technologies also provide the opportunity to bring together a wide group of devices. 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 (Costello & Knott, 2005). This is depicted in Figure 5.

Convergence at the services level is already happening. Users may use a phone to watch television, listen to the radio, chat, play games, browse the Internet, access location-based services; for video conferencing purposes and so forth – all in one handset.

GSM-evolved networks will be integrated with WLANs, 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 (Nokia, 1999). 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.
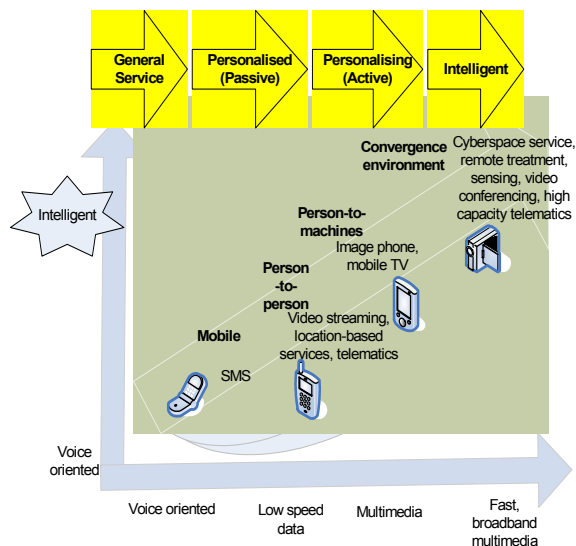

Figure 6: The Development of Services (*adapted from* Lee & Han, 2005).

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 (Travish & Smorodinsky, 2002). This means that personalisation can be achieved by offering location-dependent information to users on the move.
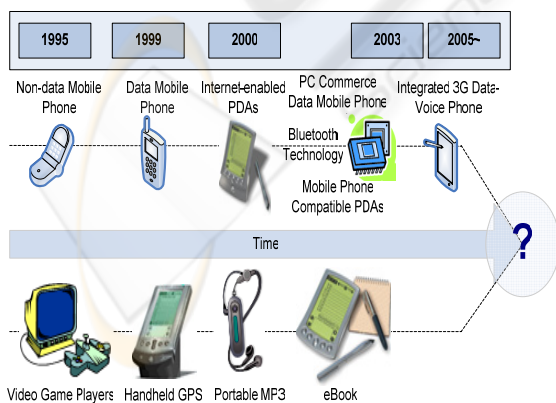

Figure 7: The Development of Terminal (*adapted from* Lee & Han, 2005).

Convergence at 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 (Andreou *et al*., 2002). 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. Furthermore, wireless data transmission consumes a lot of energy (Schiller, 2000).

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 (Andreou *et al*., 2002). 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 (Andreou *et al*., 2002). 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 (Schiller, 2000). Figure 7 shows the development of terminals over the past decade.

The evolution of radio and mobile core network technologies over the last two decades has enabled the development of the ubiquitous personal communications services, which can provide the mobile user with voice, data, and multimedia services at any time, any place, and in any format (Lin & Chlamtac, 2001). Business opportunities for such services are tremendous, since every person could be equipped, as long as the service is fairly inexpensive (Andreou *et al*., 2002).

The advent of FMC has ushered in a good deal of confusion around the appropriate business models for the new services. By examining FMC industry from multiple perspectives from various players of the value web as well as researchers of dissimilar background, it is possible to bridge the gaps found in various definitions in order to reach a common understanding. Based on these evolutionary pathways, players in the FMC industry must work together to deliver services to end users. Model shown in Figure 8 was developed to depict how the stakeholders can collaborate to deliver FMC services.
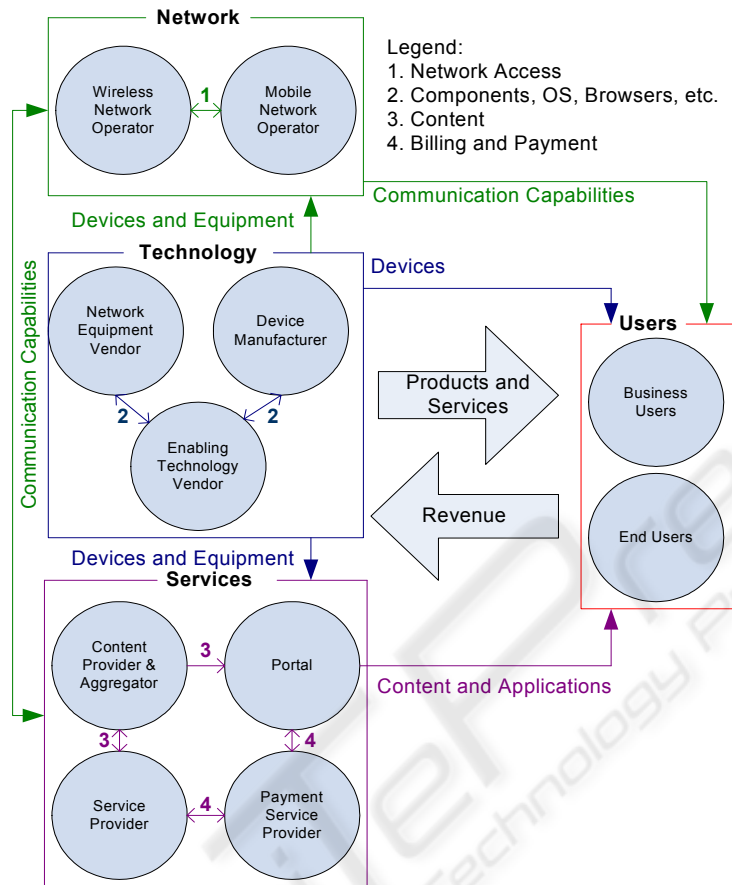
Figure 8: FMC Stakeholders' Map.

5 DEPLOYMENT OF CONVERGENT SERVICES

In South East Asia, SingTel (Singapore) introduced three new and innovative services that would benefit fixed-line, mobile phone and Internet users. The services are OneM@il and Single Number Service. Service trials for OneM@il had rolled out in July 1999 (SingTel, 1999). The commercial launch of these services followed in 2000 (SingTel, 1999).

SingTel is offering these convergent services to bring mobility and convenience to customers who will be enjoy the benefits of integrated telecommunications, IT and Internet capabilities (SingTel, 1999). SingTel's OneM@il service makes message retrieval easier, faster and without hassle (SingTel, 1999). All voice mail messages (whether to a fixed-line or mobile phone); e-mails and faxes are integrated in one mailbox and can be retrieved from fixed-line telephones, mobile phones or personal computers. OneM@il is equipped with a sophisticated text-to-speech conversion engine which 'reads' messages (SingTel, 1999). This means that users of the service do not need a PC to retrieve their e-mail. They simply access their OneM@il mailbox to listen to a voice recording. The service enables users to link multiple e-mail accounts. All users are given a virtual fax number. Fax messages can either be printed on any fax machine or read from the Internet (SingTel, 1999).

On top of these, to expand its current offering of Fixed Mobile Integrated (FMI) services, SingTel announced the launch of a Single Number Service to benefit its fixed-line customers. FMI refers to the seamless integration of the fixed-line, mobile phone and paging networks (SingTel, 1999). Such services are currently available for mobile and paging customers and SingTel aimed to extend it to fixed-line customers as well (SingTel, 1999).

In Malaysia, Maxis' Wireless Office Solutions (BlackBerry) satisfies customers' data and voice needs via a single, integrated handheld solution. Customers now have access to a broad range of applications which include e-mail, phone, intranet, Internet, SMS and personal information management applications operating over Maxis' GSM and GPRS network (Maxis, 2005). BlackBerry from Maxis boasts 'push' technology, which automatically routes all e-mails straight to user's handheld (Maxis, 2005).

6 CONCLUSIONS

The FMC revolution is changing the way people live and work. Mobile devices are already pervasive in all major developed economies and in an increasing number of developing ones as well. The study presents a number of business models in order to examine FMC industry from multiple perspectives. In this manner it is possible to deal with foreseeable convergence of the various mobile technologies. A stakeholders' map is developed to depict how players in the FMC industry can collaborate to deploy services. It is implicit throughout the study that proper understanding of the FMC industry enables players in the value web to adopt appropriate business models in South East Asia to bring services to market and how they should cooperate, share revenue and jointly create competitive advantages.

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