THE TRANSFORMATION OF MOBILE TELECOMMUNICATIONS INDUSTRY IN PAKISTAN

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Abstract

This paper studies the dynamics of mobile telecommunications market in Pakistan. It draws on the emerging approach that views mobile telecom industry as a complex socio-technical system comprising both human and technological components. Three set of actors that make such system are studied in depth. These include Institutions, Providers and Users. It is argued that the development of a viable mobile market depends on the creation of a feasible environment that encourages growth in the market. The unique combination and actions of various actors in the industry shape and contribute to the development of such environment. The creation of these conditions is thus a combined success or a failure of all actors involved. The study provides evidence that a pro-competition, liberalised and fair policy that provides level playing field to service providers is imperative for the success of mobile telecommunications. It emphasises on the importance of an independent regulator, technological innovation and harmony among all stakeholders to develop a successful mobile industry.

Keywords: Adoption, Cellular Network, Diffusion, Innovation, Mobile Telecommunications, Pakistan
1. INTRODUCTION

Mobile telecommunications industry has grown exponentially over the last two decades (Kenny and Keremane, 2007). In a country, mobile sector has become a critical indicator of economic development. Mobile technology provides a unique opportunity for the developing countries where telephone diffusion has been very low. Specifically, due to its comparatively low investment requirements, mobile telecommunications allows these countries to take advantage of technology innovations to provide communications services in the areas with limited or no telephone network (Noll, 2000; Thompson and Garbacz, 2007). However, the potential of mobile telecommunications has not been fully utilised in many parts of the world. This is evident from its uneven pattern of diffusion, over 94% penetration rate in Europe in contrast to that of 22% in Africa (ITU, 2007). It is imperative to explore the factors that determine the mobile telecommunications development in a country.

This paper analyzes the innovation of mobile telecommunications market in Pakistan. Pakistan provides an interesting case due to the triple digit growth in its mobile telecommunications industry over last few years (PTA, 2006; Nasir, 2006), and the lack of research that explains it. The paper follows an interpretive approach to study the case (Easterby-Smith, Thorpe and Lawe, 2002). Data is drawn by conducting 15 in-depth, semi-structured interviews in the semi-natural environment. Our interviewees include mobile operators and the regulator being the key actors in mobile market. All interviews were recorded, transcribed, summarised and translated into English. To help us be able to maximise recall, we have taken notes and edited a project log and maintained a database so as to keep track of data. The transcripts were then analysed based on our framework. The findings from the interviews were corroborated through secondary data in particular archival records (Wiklund, Lindholm and Lindstrom, 2002). Important events in the Pakistan mobile telecommunications industry were identified and analysed from 1990 to present.

The paper is structured as follows. The next section defines mobile telecommunications market and forms our theoretical framework. Drawing upon this framework, in Section 3 we analyze the case of Pakistan. The last section discusses the key issues and concludes the paper.

2. THE FRAMEWORK

Today mobile telecommunications industry has become a more and more important part of the world economy. With over 2.3 billion subscribers, the user base is still increasing at the rate of about 1 million new subscribers per day (Alam and Prasad, 2008). The mobile telecommunications market has been innovating continuously. By mobile telecommunications market innovation being the research subject of this paper, we means the dynamics in adoption of new technologies by the operators, the availability of new services to the users, and the participation of different players in the market with varied roles (Gao and Damsgaard, 2007).

Thus, we define mobile telecommunications market as composed by two sorts of elements: mobile standards and services in the technological domain, and market players in the social domain that determine their usage (Gao and Damsgaard, 2007). There is an interplay between the two domains. As mobile telecommunications industry develops driven by technology innovation, accordingly varied providers and users will enrol themselves in adopting new services. These actors work together to promote the market growth further (Tuomi, 2002). Our purpose is to understand how mobile
telecommunications market has innovated in Pakistan, and what actors have participated in the market and influenced the market innovation process, and how.

Based on the above definition on mobile telecommunications market and following our research purpose just stated, in this section we establish our framework as shown in Figure 1. The theoretical foundations of this framework can be traced to actor network theory (Akrich, 1992). We identify three set of actors that play an important role in the development of mobile telecommunications industry, namely the users or customers, service and technology providers, and the governmental institutions. In the following we will refer to the literature to dissect and rationalize this framework.

![Figure 1 Components of mobile telecommunications market](image)

### 2.1 Technology

The first group of components for mobile telecommunications market are technologies adopted by the mobile operators which are categorized into different generations, and the services provided to the customers. Since their inception, the evolution of mobile technologies can be explained in a number of evolutionary stages or generations, each improving the air and network interface standards both in terms of cost and performance. The development of international standards is critical for the growth of mobile telecommunications industry. Standards provide the economies of scale that reduces infrastructure cost of the operators and terminals and other accessories for the users, increases competition in the procurement of essential components, provides facilities such as roaming to users and simplifies the service along with enhancing spectrum efficiency (Harrison and Holley, 2001).

Specifically, the first generation (1G) standards (e.g. Advances Mobile Phone System, AMPS) introduced in 1980s used the analogue radio signals for communication. For 1G, the mobile terminals and network infrastructure was very expensive and had relatively poor performance, limiting its use only for the business purposes (De Vriendt et al, 2002). In mid 80s the usefulness of digital signal processing became apparent and the work on the second generation (2G) standards began. The most popular is Global System for Mobile Communications (GSM) which was established to create a new pan-European system allowing users to roam across country borders without any disruption in the services. GSM has since proved to be a huge success. In 2006 there were over 2 billion GSM subscribers that constituted 84% of the total mobile telephone population (GSM World, 2006). Today, as the improved versions of GSM, the 2.5G standard known as General Packet Radio Service (GPRS) and the so-called 2.75G standard Enhanced Data Rates for GSM (EDGE) are operational along with
the 3G standards (such as W-CDMA), while 4G standards are in developmental stage. The trend of technology innovation in mobile industry is to allow mobile phones to integrate with other technologies such as digital cameras, mp3 player and voice recorders. Meanwhile, the surge in data communication has created more demand for high data connectivity (Alam and Prasad, 2008; Yoo et al, 2005).

2.2 Institutions

The second group of components for mobile telecommunications market are the social organizations and individuals participating in its innovation process. Institutions are important market players. Here institutions include any type of industrial, national or international organisation that has the ability to influence, direct, limit or prohibit any activity related to innovation and diffusion of mobile infrastructure (Nelson and Nelson, 2002). We particularly focus on regulatory regime which is one of the most important institutions that affect and shape the mobile telecom industry (Gruber, 2005). Regulatory regime is responsible for setting the regulations in a country while regulations are the standards and rules promulgated by the government to control and monitor the business activities (Koski and Kretschmer, 2005).

There are two main sets of theories on the rationale of regulation. The conventional theory is based on the economic notion of ‘market failure’. According to this assertion, purpose of regulation is to achieve certain publicly desired results (Chang, 1997). From a different point of view, positive theorists focus on the political influences and interests on the regulation, and term it as ‘political capture’ (Mitnick, 1980). However, both schools consider the role of independent regulator as critical, as echoed in the pro-competition regulations in the Agreement of Basic Telecommunications that came into force in 1998 under the World Trade Organisation (WTO) mandate. The rights endowed to the regulator normally come from the concept of statehood and the public control over the regulatory state bodies (Smith, 1995). Regulator can enable or constrain innovation or economic activity in the industry in different ways. One important method is through an industrial policy which provides the vision for the overall sector development using a macro-level approach. This can affect the market structure by favouring either monopolistic or liberalised market composition (Gruber, 2005). Regulator can affect the market structure and dynamics through various other instruments. These can be categorised as regulatory interventions that include the issues such as licensing, pricing model, subsidization, interconnect charges and mobile number portability etc. and regulatory monitoring that includes checks on the quality and service pricing etc (Yoo et al., 2005). This paper particularly focuses on the licensing policy as this has strategic impact on the mobile telecommunications industry in Pakistan. The licensing policy in Pakistan hugely contributes to the formation of this particular market structure and can be used to restrict or promote competition.

2.3 Providers

The providers are key players to drive mobile telecommunications market innovation. The providers include all members of the complex value-chain that promotes the invention and delivery of commercial mobile services to the users. These may include the network operators, service providers, content providers, standard setting organisations, consultancy companies and industrial organisations etc. Traditionally the mobile service providers have relied on the voice services for revenue generation and growth however as the mobile industries innovate forwards, these services have almost levelled between different competitors (Peppard and Rylander, 2006). It has therefore become important for the service providers to look for other ways to increase the traffic volume on their network and thus gain higher. This can be achieved by either increasing the number of their customers meanwhile maintaining the average revenue per customer, or maximising the use of services by the existing customers. However, with the markets increasingly saturated, the former seems a difficult proposition.
Strategies to snatch customers are likely to be imitated by the competitors resulting in a zero-sum game and the waste of resources with little gains. The implementation of the second strategy requires service providers to offer attractive services and contents. This has increased the importance of deploying data services, which are widely speculated to be the sector where the potential for growth lies (Gao and Damsgaard, 2007). The nature of a business model that may achieve this is not clear yet, however it is increasingly evident that the market of providing these services may not be a monopoly and new players will emerge. The service providers are facing challenge from alternative technologies such as Wi-Fi and Wi-Max in the provision of new services (De Lussanet, 2004). In fact, following the internet style commercialisation, a myriad of third party organisations is expected to develop, control and offer the digital content that may include large media conglomerates such as Disney, NBC and Sony into the mobile market. This situation presents a challenge for mobile operators as they would not like to end up like the Internet Service Providers (ISPs), which finally became purely the access point to the digital services and were unable to generate revenue comparable to their counterparts such as Google or ebay (Peppard and Rylander, 2006).

At present, many new actors are operating in the market, for example the mobile transactions and payment security providers, application providers, portal providers and mobile-ISPs (Figure 2). The need for the provision of new services is expected to catalyse the innovation and development of new technology capable to provide and handle broader bandwidth to enable faster data access. The cooperation of the traditional mobile operators with the third parties are likely to happen which will result in a much complex value chain for mobile services (Harmer and Friel, 2001).

![Figure 2: Mobile services value chain](image)

2.4 Users

Users are a kind of important actors in the mobile service value chain. In the existing vast amount of research on mobile market, people understand the market from different viewpoints, and see the users as either a social or an economic entity in the market. In the first approach, based on particular attributes and characteristics for example age, gender, socio-economic status, education levels, household composition and postcode information, the market is divided into different segments (Anderson et al, 1999; Green et al., 2001). The second approach is followed largely by the industry analysts in the attempt to understand current market parameters and predict the future patterns. They categorise customers on the basis of data obtained at the point of sale and registration including tariff, handset preferences, and mode of payment of each customer. They also analyze service usage data, like time, duration, cost, and the types of numbers called (Green et al, 2001). There are three schools of thought on the user behaviour, which focus on diffusion, adoption and domestication, respectively. The proponents of the diffusion theories see the market development as a process dominated by different types of users: early adopters, early majority, laggards and non-adopters (Rogers, 1995). Scholars of the adoption school use theories like technology acceptance model to explain adoption decision by the consumers (Davis et al, 1989). This branch of studies aim to describe adoption process at individual level, some only focusing on the decision to adopt the innovation while others also exploring the consumer’s attitude towards using mobile services as a habit (Pederson and Ling, 2002; Pederson et al, 2002). The third school of thought explain adoption as domestication and focus on the adoption and use of technology in everyday life. In this view, with
respect to mobility mobile users can be categorised into stationary, nomadic and mobile users (Saugstrup, 2003), or travelling, visiting and wandering customers (Kristoffersen and Ljungberg, 1999). The most accepted categorisation scheme in the mobile telecommunications industry however may be that of work and leisure, which stems from the fact that mobile handsets have initially been conceptualised as a business tool (Green et al, 2001). Other aspects such as culture, values local norms and customs also have significant impact on the adoption and use of the mobile services (Barnes and Huff, 2003).

3. PAKISTAN MOBILE TELECOM INDUSTRY

Pakistan is located in South Asia neighboured by Afghanistan, China, India and Iran. It is the seventh most populated country in the world with population of 160 million. Pakistan is a middle income country with per capita income of US$846 and the country has recorded an average GDP growth of 7% over the last five years (MoF, 2008). Despite going through political turbulence during 2007 due to political wrangling between ruling military regime and various political and social classes and facing constant threat of religious militarism, Pakistan has achieved success in mobile telecommunications. The telephone penetration rate per capita has jumped from 4% in 2000 to 58% in 2007 as a result of over triple figure growth during last few years (PTA, 2008). Using the framework in Figure 1, in this section we analyze the factors responsible for this huge transformation in Pakistan mobile telecommunications industry from 1990 to 2007. This time period is divided into three distinct phases based on the critical events that took place in the industry. Our identification of key events is driven by significant changes in policy during the time of analysis. These start from 1990 when the first mobile licences were issued to two private companies in Pakistan. The industry however remained in the state of infancy and under a ‘managed competition’ with frequent government interventions without clear regulatory policy. The Telecom Act 1996 provides another key event that took the mobile industry into its second phase. Since 1996, regulatory bodies were established and strengthened to oversee the development of mobile industry and protect consumer rights. The process of de-regulation and liberalisation was firmly established in 2004 with the announcement of a comprehensive mobile cellular policy that re-affirmed government’s commitment to create a liberal and free mobile telecommunications market with fair competition in the country. This thus marks the start of a new era that saw exponential growth in this sector. Figure 3 shows the overview of the three phases described above and the changes in the actors during these.
During 1990 and 1995, Pakistan telecommunications sector presented a mixed picture with a government owned monopoly in fixed telephone infrastructure while a ‘managed competition’ in the mobile telephone network (Hashim, 2006). Although the government decided to look towards private sector for the provision of value added telecommunications services (non-voice services) and the mobile telephony in late 1980s, it did not initially formulate a far reaching policy for this initiative and no institutional mechanism was established to oversee and regulate the newly emerging industry. Especially in issuing mobile licenses, the government lacked a guiding policy which resulted in complications right at the start of launching mobile telephony in Pakistan. In 1990 two licenses were awarded to Paktel and Instaphone with a promise to support this duopoly for next 15 years (Looney, 1998). However this promise could not withstand the changes in the political setup, and a third license was issued in 1992 to Mobilink which was owned by a federal minister and headed by the son-in-law
of the President. Mobilink also had the foreign support as it was partly owned by the international giant Motorola. Instaphone and Paktel however fiercely objected to Mobilink’s entry into the market and the dispute ended in the court. This saw a period of allegations and counter allegations of corruption and kick-backs in awarding the licenses during the both political governments (Anwer, 2006; Mufti, 2006). Eventually in 1994, Mobilink was allowed to operate its GSM network, whilst the incumbents Instaphone and Paktel only had 1G AMPS networks. After this initial dispute, another controversial government intervention left the nascent industry disenchanted. In a bid to improve the law and retain order in the largest city Karachi which was tormented by the violent political and ethnic conflicts, government banned the mobile services in the city in 1995. The decision meant that the 26,000 mobile subscribers (more than half of the total number of subscribers in Pakistan at that time) would be lost by the operators. It took two years of political and technical bickering to lift the ban but the damage had been done in terms of stalling the growth and discouraging the potential foreign investors. The need for an independent and fair institutional mechanism was badly felt that could provide the single point of contact to all stakeholders and set rules of the game (Mufti, 2006).

The pioneers of cellular services in Pakistan Paktel, Instaphone and Mobilink were originally joint ventures between forward-looking Pakistani business houses and international operators. International giant Cable & Wireless had 80% stake in Paktel along with 20% of Hassan Associates Pvt. Ltd. Another multinationl operator Millicom had significant (61.3%) share in Instaphone along with local Arfeen Group’s 38.7% and similarly Mobilink was owned by International Wireless Communications, Motorola and Saif Group (Haroon, 2005; Anwer, 2006). This brought the latest management practices and corporate culture to traditionally bureaucratic environment in Pakistan (Mufti, 2006). The providers however, for most part of this period remained in constant conflict and litigation with each other.

As far as Standards and Services are concerned, the mobile industry mostly relied on voice services. Both Paktel and Instaphone installed 1G AMPS based network, however Mobilink achieved technological superiority over its competitors by establishing 2G GSM network that provided better voice services than other operators. Also it was able to introduce SMS as a low cost alternative to phone calls. Moreover, GSM provided roaming facilities and the use of SIM cards allowed customers to switch handsets easily (Moeen, 2006). The GSM handsets were more flexible and superior than the big, black AMPS handsets that “we used to call bricks”, as Mr. Moeen, Mobilink’s marketing manager puts it. These technological advantages made Mobilink grab 24% market share from its competitors by 1995, despite its late entry into the market (Instaphone held 31% and Paktel took 45% of the market share).

The early users in Pakistan of the mobile services were the professionals, industrialist, businessmen and feudal-landed politicians that belonged to high income groups. This group of people was concentrated in the urban areas such as the cities of Karachi, Lahore and Islamabad. The usage was almost totally by male and mostly for business purposes. The users mainly belonged to the age group of 35 to 55. At this time mobile phone was conceived more as a fashion accessory and social status symbol among the rich rather than a communication device. As one of the interviewees said, the mobile handset was taken as a toy of the rich people (Gulfam, 2006). The mobile services therefore remained out of reach of the common person throughout the period from 1990 to 1996. The combined customer base by 1996 could only reach 68,000. Along with high communications charges, the government levied heavy taxes on mobile services, which contributed to this situation. For a network connection a customer had to pay an activation tax of Rs. 7000 to the government and Rs. 2000 to the operator (1000 Rs. = 16USD). The only payment method available was post paid. A further security deposit of Rs. 10,000 to Rs. 40,000 was required, depending on the estimated usage. The call charges ranged from Rs. 15 to Rs. 20 per minute and a line rental of about Rs. 300 per month was also payable. On top of all this, buying a mobile hand set was a considerable investment with the prices in the range of Rs. 25,000 to Rs. 40,000. In a country with per capita income of US$400 at that time and huge
urban-rural and gender based divide in the socio-economic conditions, it was clearly not affordable for the vast majority to enjoy the mobile services (Moeen, 2006).

3.2 1996 – 2003: Establishing the Base

The period from 1996 to 2003 saw important steps taken towards reshaping the market structure of telecommunications in Pakistan by making progress on establishing key institutions and public policy formulation. The government succeeded in passing the Telecommunications Act 1996 which provided a legal framework for conducting market deregulation. Through this law, the government declared its intention to privatise the entire telecommunications sector including the fixed line network. The law also created two institutions that were to be proven crucial in the development of mobile network in Pakistan. These were Frequency Allocation Board (FAB) and Pakistan Telecommunications Authority (PTA). FAB was responsible for allocating frequencies and managing spectrum. The mission of PTA was to protect the rights of licensees and consumers, to make decisions promptly in an open, equitable, non-discriminatory, consistent and transparent manner, to act expeditiously and to encourage fair competition. Its responsibility included regulating the provision of telecommunications services in Pakistan, issuing licenses to telecommunications operators, and overseeing tariff setting (GoP, 1996).

Other important strides were taken in organisational re-arrangement of regulatory bodies. After forming FAB and PDA, the Ministry of Communications (MoC) only had limited regulatory function thus MoC was demoted to a division of the Ministry of Science and Technology (MoST) in March 2000. After the 2002 election and in a new political setup, it was then transferred to the newly established Ministry of IT and Telecommunications (MoITT) where it still exists today. However, with the creation of MoITT, PTA was placed directly under its Cabinet Division which provided it the much needed institutional autonomy. During this time of political juggling it became evident that Pakistan initially struggled with the idea of having an independent regulatory regime in accordance with the WTO Telecom Reference Paper Guidelines that were accepted by Pakistan in 1998. These institutional arrangements have been instrumental in shaping the future of mobile telecommunications industry in Pakistan (Hashmi, 2006). The contrasting priorities of the persons in charge of Pakistan telecommunications saw the emergence of two different yet complementary ICTs policies in Pakistan. Under the MoST headed by Dr. Atta-ur Rehman, information technology in general got a head start in 1999 and early 2000s as indicated by the emergence of various educational institutions in information technology related fields and the diffusion of internet into most cities and towns of Pakistan. Under the leadership of Mr. Awais Khan Lagari (Minister for MoITT), the priority was shifted to the telecommunications sector. Some skilled telecommunications professionals from various national and international bodies guided the ministry to devise telecommunications development policies. The inducted professionalism was quite contrary to traditional bureaucratic norms. The consultative and transparent process of public policy making never witnessed before in the history of Pakistan was introduced. This included placing the policy drafts on the ministry’s website before finalising and allowing all the stakeholders to openly review and debate the policy before it is finalised (Haroon, 2005). Through regulatory developments on interconnection arrangements, Caller Party Pays (CPP) system was introduced in 2001. This meant that the customers could now enjoy free incoming calls. This innovation triggered 150% growth in mobile subscribers from 2000 to 2001 (Moeen, 2006). The mobile development was also promoted by introducing more competition into the market. At the end of 2000, a license for operating GSM services was awarded to Ufone, a subsidiary of incumbent fixed line operator PTCL. Also PTA reduced the activation charges on new connections from Rs. 7000 to Rs. 2000 and then to Rs. 500 (Mufti, 2006).

Among the providers, Mobilink emerged as a market leader in 1997 by taking over its competitors in terms of numbers of subscribers. It further consolidated its lead to acquire an impressive market share of 64% by the end of this period. The growth was hugely contributed by innovative pre-paid services launched by Mobilink which was rapidly copied by the other providers as well. Although the reasons of starting pre-paid payment method were the problems in revenue collection and reluctance of
customers to pay security deposit to obtain post-paid connections, it turned out to be the best thing that had happened in the mobile industry by that time, today well over 95% of all subscribers are on pre-paid tariffs (Mufti, 2006). The entry of Ufone into the market fuelled the competition further. Ufone focused on the youth and to attract this group of potential audience, it embarked an effective media campaigns before launching the services (Gilani, 2006). Ufone’s marketing strategy especially the advertisement on electronic media completely changed the perception of the mobile from a businessmen’s tool to a service essential for a common man. By the end of 2003, Ufone had captured 16% market share while that of incumbents Instaphone and Paktel had shrunk to 11% and 9% respectively (PTA, 2008).

Significant strides were taken with respect to Standards and Service improvements in this period. Faced with tough competition from GSM based networks of new entrants Mobilink and Ufone, the incumbents Paktel and Instaphone had to upgrade their networks from AMPS to D-AMPS (digital AMPS) which enabled the provision of SMS, web browsing, email and other value added services. As a result of these upgrades, Pakistan achieved 100% digitisation of its mobile network by 2003 (Mohsin and Ishaq, 2004). In order to increase its shrinking customer base, Paktel made a desperate attempt to further upgrade its network to GSM and provide better data services and international roaming facility in 100 countries along with its voice and value added services. It also planned to expand to cover 150 new cities and towns across the country (Hassan, 2005). However Paktel’s plans were severely delayed due to a dispute with PTA who demanded Paktel to purchase a new license for GSM at the cost of US$11.1 million that Paktel was not prepared to pay. The matter was finally resolved in the court that ruled in PTA’s favour and after agreeing to pay, Paktel launched its GSM service 2004 however the time taken by this dispute created uncertainty in the customers and stalled the company’s growth leaving it with the lowest market share for the first time in the history of Pakistan Cellular industry (Khan, 2006). Meanwhile the market development was boosted by the large inflow of the cheap mobile phones from China that brought the handset prices down. Further innovations e.g. colour screen and other features such as polytonic ringtones etc also added to the appeal of mobile phones in Pakistan especially in youth (Moeen, 2006).

The user base of the mobile services expanded during this period. Now, as one interviewee put it: “people walking on the footpath, talking on a mobile phone started to become a familiar site” (Gulfam, 2006). The usefulness of the mobile phone now started to being realised by the common person. The students from smaller towns and villages studying in larger cities could stay in touch with their families through a mobile phone, the cost of travel was reduced for the fishermen and the farmers who could use it to find the rates of their products before hand and friends could communicate at anytime without need of a fixed line (Nasir, 2006). The total number of subscribers increased from 68,000 to over 5 million during this period and now included a wider range of user groups such as the middle class government servants and working class professionals, especially the youth (PTA, 2008).

3.3 2004 – Present: Exponential Growth

Since 2004, the regulatory institutions were further strengthened and new strides were made on policy issues. To enhance the mobile infrastructure in Pakistan and increase competition in the market, PTA issued two more licenses for the provision of mobile services in the country to two foreign based companies: Al-Warid of United Arab Emirates and Telenor of Norway. Both committed to substantial investment in mobiles network (Nasir, 2006). This initiative was preceded by the publication of Mobile Cellular Policy in 2004. This policy reaffirmed the government commitment to a competitive telecommunications market and encouraged private investment in this sector. It also pledged to ensure efficient use of spectrum, increase consumer choice at affordable and competitive rates, and recognize service provider’s rights and obligations (Hashmi, 2006). The policy prohibited the SMP (Significant Market Power) operator from cross subsidization, price manipulation, interference with competitive market dynamics or engaging in anti-competitive conduct. It also declared the interconnection to be
the right of new entrants and allowed them to co-locate in incumbent PTCL local and transit exchange buildings and to connect their fibre and radio links to PTCL building. It empowered PTA to promptly investigate the allegation of anti-competitive conduct and impose remedies if such conduct is proven. Mobilink is recognised by PTA to have the SMP status in the mobile industry at present (GoP, 2004).

The fierce competition in the market forced providers to look for new customers and launch major expansions of their networks. Also this has led to more segmentation in the market and the adoption of distinct strategies by the respective companies focusing on product differentiation and also on niche markets. Mobilink for example wants to keep the lead on technological grounds and focus on high tech, up market niche to maximise its revenue per customer. It has the largest coverage in Pakistan with more than 1800 major cities and town covered and has also recently bought the exclusive rights from the Pakistan Cricket Board for providing cricket updates using its network which will certainly add to its appeal in the cricket-crazy Pakistani nation. Ufone continues to focus on youth, Warid has launched specialist corporate solutions and packages to attract business and professional market and has also announced plans to launch Pakistan’s first WiMax network for wireless data services (e.g. broadband) while Telenor aims to compete on quality of service. This leaves Paktel and Instaphone to compete on prices with Paktel offering for the first time in Pakistan ‘per second billing’ and free Paktel to Paktel calls and Instaphone the cheapest pre-paid SMS and call rates (Mufti, 2006). However, 50% of the market share remained under the control Mobilink. Ufone retained second spot with 21% of market share. The impressive performance from new entrants Warid and Telenor made them quickly capture 14% and 11% market share respectively while Paktel and Instaphone had 3% and 1% market share respectively.

There is also a race in the industry to upgrade to higher standards of services. In 2004 Mobilink became the first company in Pakistan to start 2.5G (GPRS) services such as Multimedia Messaging Service (MMS) which was further upgraded to 2.75G (EDGE) technology (Mobilink, 2006). Users could use Blackberry handsets to access a lot of data services. Through these services, Mobilink plans to capture the high-tech market in Pakistan. As described by the Marketing Manager of Mobilink: “At the moment there is a race in the market towards 3G… I believe there is market for such (data) services and we would like to be the first company to capture this market” (Moeen, 2006). In the same year Ufone also took a step to strengthen its technology and upgraded to 2.5G. Both companies started offering services such as SMS, Web-2-SMS, SMS-2-email, SMS-2-TV, Bill payment through ATM, power tools such as ringtones, logos, picture messaging, mobile greeting cards, international roaming, G-Mail, E-mail notification, fax, voice mail, call waiting, call forwarding, song dedication services, IVR chat-line, mobile banking etc. (Ufone, 2006). In September 2006, Ufone entered into a contract with Chinese company Huawei Ltd for the provision of required equipment to enable its network evolve into 3G smoothly. Meanwhile, Telenor signed a big contract with Nokia and Siemens to build and upgrade its network from 2G GSM to 2.75G EDGE in most parts of densely populated Punjab and Federal Capital territory (SPG, 2006; Telenor, 2006; Nasir, 2006). Warid worked with Ericsson to expand and upgrade its GSM network (Technology News, 2006). By the end of 2005, the four major GSM operators in Pakistan, Mobilink, Ufone, Telenor and Warid, had already started offering internet access on mobile phones using Wireless Application Protocol and are preparing for launching the 2.5G and 3G technologies to cater the potential market demand.

This was the time when users saw the real value in the use of mobile services. The number of subscribers rocketed from 5 million in 2003 to 36.5 million in July 2006. The period saw the cost of obtaining a mobile connection was reduced to less than US$ 8 with further bundled air time offers. Intense competition in mobile handset market has also reduced to price of an average handset to Rs. 6,000 while a second hand phone can be purchased on an average price of Rs. 2000. The users can now obtain the connection instantaneously and the low income groups make the majority of mobile user population in Pakistan. The most remarkable revolution of the mobile adoption has been the realisation of its benefits by those who had never owned or even used the telecommunication services.
The low income groups make the majority of mobile user population in Pakistan today. Even the taxi driver Bashir, who took the author around in Islamabad while conducting interviews for this research, uses a mobile phone. He maintains close ties with his customers and has now got a pool of permanent customers who call him (using mobile phone) whenever they need a taxi. This saves and is also more convenient to both parties. The importance of telecommunications to poor and underdeveloped communities was also witnessed after the devastating earthquake in Pakistan in October 2005 that took the lives of over 70,000 people and destroyed whatever limited fixed line telecommunication infrastructure was available in the affected areas. As part of the reconstruction efforts, mobile operators were encouraged to install their networks in the areas to provide telecom services. The people never felt more about the need of communication than while facing such a major disaster when they had no way to find out about their family and friends or call for help if required.

“…need to communicate was felt so badly by the people that the first thing that they did when they received the first instalment of the compensation from the government to rebuild their houses… was to buy a mobile phone” (Gulfam, 2006).

The above examples show that the benefits of the mobile telecommunication are reaching at the grass root levels of Pakistani society and are set to have far reaching social as well as economic impact on the people of all ages, income groups, gender or demographics. In one of the rare surveys on the Pakistan mobile industry conducted by EJAD (2005) a sample of over 100 consumers and about 30 employees was used to establish user perception about the industry. Over whelming majority of respondents (97%) reported substantial decrease in call charges, mobile tariffs and other taxes (such as activation tax), 96% admitted it is much easier to obtain a connection and 49% confirmed improvement in customer service (26% said it deteriorated while 23% thought it remained the same). The areas of concern have however been the issues related with service quality that had mixed response. 48% said it improved, 33% felt it has deteriorated while 16% observed it remained the same.

4. DISCUSSION AND CONCLUSION

The analysis of Pakistan mobile telecommunication industry provides enough evidence for its conceptualisation as a complex socio-technical system where both the technological and the social actors play their role. In the first phase it is clear that the actors were in constant conflict with each other and the relations between two subsequent governments and providers were sore. This was also true for relationship between different providers as well. The second phase saw better alignment between the interests of these actors with establishment of regulatory mechanism and cooperation among providers on the principle of co-existence. Third and last phase was marked by harmonious relationship between all stakeholders which along with continuous technological improvements resulted into exponential growth in market despite intense competition. A summary of all three phases is provided in table 1.

The analysis highlights the need for adapting consistent and clear policies by the government which requires political stability and strategic vision with well defined priorities. The ambiguity and constant changes in the policy deters the investor’s confidence and stalls any further investment or expansion of service as was the case in the early years of Pakistan mobile industry where the government lacked a clear policy and also changed stances whenever there was a change in political setup. Also the policy of market liberalisation has proved instrumental in developing a world-class mobile network and has yielded other benefits as well such as attracting large amount of Foreign Direct Investment, providing employment to thousands of people, developing country’s human resources, catalysing growth and positively affecting socio-economic conditions of many. Promoting competition in the market has also helped to reduce prices, increase quality and provide more services to the customers. It has further
helped in fostering innovation and forcing operators to look for network expansion to reach out for new customers thus catalysing market growth.

The study also reveals that institutional arrangements play an important role in organising government’s strategy and responding to the market changes. Most important of these is the establishment of an independent and impartial regulator that is crucial to provide a level playing field to all competitors and resolve conflicts. The regulator also requires political backing from the highest in the hierarchy of government to work without being influenced by the personal agendas of various political or economic forces. This requires commitment at the ministerial and higher level and also an effort to reduce the red-tape and other bureaucratic barriers that makes it difficult to start and run business. The leadership styles are important in developing such culture within the traditionally slow and bureaucratic government organisations in developing countries. Pakistan has been lucky in finding two dynamic personalities as ministers of concerned departments in the later half of mobile history to conduct affairs in a transparent, independent and consistent manner that has been highly acknowledged by the foreign and domestic investors. Therefore the government and the regulator have to gain the trust of all other players involved and this requires maintaining a fine balance between the consumer and operators/service provider’s interests. Learning from their mistakes in the initial period, government of Pakistan and the regulator PTA has done exactly this in a remarkable transformation to heavily contribute in the recent growth in the telecom sector. Other government initiative that have been proved useful include introduction of Caller Party Pays regime and adapting a technology neutral policy.

In the case of Pakistan, the network operators are also the service providers and have to take care of everything regarding the provision of service to the customers. They therefore need to constantly come up with innovative ideas and services in order to keep ahead of competition and offer better value. These innovations have also proved to be helpful in fuelling the market growth e.g. the launch of prepaid payment cards by Mobilink triggered a big increase in mobile subscription. The recent offerings by the operators such as per second billing and same call rates for all parts of the country are also set to encourage more people to join mobile network. Technological advancements are also a key factor in market growth as evident from the added appeal due to the cosmetic features and other facilities of GSM handsets. The launch of SMS was also a big successful and an important example of getting user interest by enhancing technological capability. The standardisation of services also helped to reduce equipment prices by providing economies of scale. This resulted in huge reductions in hand set prices and brought the cost of owning a mobile phone down. Market knowledge and knowing one’s customers is also a key to operator’s success. Paktel and Instaphone for example failed to formulate and execute a clear strategy in the wake of rapid changes in the market with increasing competition and shifting market needs. They now find themselves with the lowest of market share from the position of once dominant players in the market while others focused on the segments of market that were traditionally neglected by the incumbents and obtained favourable results.

The co-operation among the operators is also useful to achieve common purpose of market development. The example of ‘prisoner’s dilemma’ is thus applicable on the Mobile telecommunication industry where ‘cooperation’ can lead to common success while ‘defect’ to the loss of all concerned parties. The results in Pakistan case were remarkable when the operators successfully lobbied together to reduce the activation and other taxes. There are still areas however where mobile operators need to co-operate for the mutual benefit, e.g. by reducing interconnect charges between them they can create a much bigger network effect that will be more capable of attracting new customers and facilitating further growth in the market. There are and always will be issues where various actors disagree for example the disagreement among incumbents and new entrants on the issue of network sharing however these need to be negotiated to help align the interests among the operators as much as possible for the further development of industry.
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<td>• Lack of consistent Policy</td>
<td>• Telecom Act 1996 passed.</td>
<td>• Pro-competitive and consumer focused Mobile Cellular Policy announced.</td>
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<td>• Ministry of Communication given responsibility for mobile telecom.</td>
<td>• Establishment of PTA and FAB</td>
<td>• Award of license to Telenor and Warid</td>
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<tr>
<td>• Award of licenses to Paktel, Instaphone and Mobilink</td>
<td>• PTA placed directly under the cabinet division.</td>
<td>• Reduction in activation tax</td>
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<td>• Government banned the mobile services in Karachi</td>
<td>• Award of license to Ufone</td>
<td>• Increased professionalism</td>
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<tr>
<td>• Nepotism and corruption in awarding licences.</td>
<td>• CPP Regime enforced</td>
<td>• Consultative and transparent public policy</td>
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<td>• Political changes resulting in conflicting policies.</td>
<td>• MoC merged into MoST and then transferred to newly established MoITT.</td>
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<td>• Heavy government taxes levied on mobile communications.</td>
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<tr>
<td>• Paktel and Instaphone became the first mobile operators</td>
<td>• Increased competition with launch of Ufone’s GSM network.</td>
<td>• Warid and Telenor enter market with GSM</td>
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<td>• Litigation and conflict between operators. Paktel, Instaphone tried to keep Mobilink out of market.</td>
<td>• Operators launched massive media campaigns.</td>
<td>• Intense competition</td>
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<td>• After favourable court ruling, Mobilink launched its services in 1994.</td>
<td>• Ufone and Mobilink focused on youth.</td>
<td>• All connection charges removed by operators</td>
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<td>• Only post paid service was available.</td>
<td>• Pre-paid calling cards launched.</td>
<td>• Bundled SMS and air time offers</td>
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<tr>
<td>• Mobile usage restricted to high income, male dominate urban users with limited penetration</td>
<td>• Increased penetration due to youth adopting the service helped by pre-paid cards, CPP and Ufone’s strategy</td>
<td>• Exponential growth, mobile diffusing to middle and low income groups, wider geographical area and age groups</td>
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<td>• Mobile penetration geographically limited to major cities of Karachi, Lahore and Islamabad.</td>
<td>• Increased adoption by students and middle/working class.</td>
<td>• Number of subscribers increased from 5 million in 1996 to 36.5 million in 2006.</td>
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<td>• Mobile used as fashion accessory and termed as ‘toy of the rich’.</td>
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<tr>
<td>• Start of mobile services through AMPS based networks</td>
<td>• Complete digitisation of mobile networks in Pakistan</td>
<td>• Race to offer 3G services</td>
</tr>
<tr>
<td>• First GSM based network launched</td>
<td>• Paktel and Instaphone upgraded their networks to D-AMPS that enabled the provision of SMS service by incumbents.</td>
<td>• Upgrades to GPRS and EDGE</td>
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<td>• Introduction of SIM cards, roaming and provision of better voice services by Mobilink.</td>
<td></td>
<td>• Launch of Web-2-SMS, MMS, international roaming, voice mail, IVR-chat line, mobile banking</td>
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<td>• Provision of internet access via WAP</td>
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<td>• Economies of scale achieved resulting in massive reduction in handset prices.</td>
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Table 1: Summary of key events in Pakistan’s mobile telecommunications industry
Analysis shows that the mobile users in Pakistan are highly price sensitive, thus there must be favourable cost/benefit ratio for the majority to adopt the service. The services should also be flexible enough to be adopted by customers from different fields of life. Highest growth has come when the operators focused on the domestic use of mobile rather than the business and commercial use and through the adoption of service by middle to low income people and the youth. There is a need therefore for the service providers to widen their range of services and focused marketing campaigns to attract a diverse range of customers. It is important to note that it is not the ‘features’ of the service that sell, but the ‘benefits’ it provides to the customer.

The analysis reveals that achieving high growth and development of a viable market for mobile services requires, what we would term as ‘feasible environment’ that provides favourable conditions for the users to adopt the service. The analysis shows that such environment evolves over time and the degree of ‘feasibility’ at a particular point in time determines the growth in the industry at that time and is shaped by the combination, actions and relationships among the various actors in the industry. The differences between the combination, policies and actions of the actors at the end of phase 1 and phase 2 when compared with that at the end of phase three (the present) clearly illustrates how this feasible environment evolves over time as the actors learn new things and new actors are added to the market. Clearly we can see emergence of a much viable mobile market in Pakistan in the last part of the analysis as result of series of actions taken by various actors highlighted above.

This therefore implies that the creation of such environment must be a collective effort by all the players concerned including those in the institution, providers and users realms. As the analysis points, the actions of one actor can have strong affects on the other actors that can shape the landscape of the whole industry. Just to give one example, the adoption of liberal policies meant fostering competition in the market that led to the awarding of more licenses to allow new entrants to operate in the market, this in turn effected the operators by fuelling competition and also affected the users by providing more choice to the customers. Therefore, study of the phenomenon from both only adoption or innovation point of view can only lead to its partial understanding. The holistic approach followed in this thesis has proved very effective in capturing the multifaceted realities of the mobile telecom industry in Pakistan and has brought out the political, human and social aspects of the network along with the role of technology which is closer to the real life.

The findings of this study are consistent with the work of Koedijk et al (1996), Banker et al (1998) and Megginson and Netter (2001) who found liberalisation, privatisation and competition as the primary driving forces behind market growth, the work of Garibaldi and Mauro (2002) on the importance of FDI for developing countries and that of Stern (1997) on the role played by independent regulator for better market efficiency. The findings presented in this paper are also in line with the study of Lyytinen and Fomin (2002), Van de Ven (2005), Yoo et al (2005) and Damsgaard and Gao (2006) on the appropriateness of adopting holistic approach to study mobile telecom market.

References


PTA (2008) Industry Report, Pakistan Telecommunications Authority, Islamabad, Pakistan
SPG (2006) Telenor Pakistan GSM / GPRS / EDGE Networks, Pakistan, SPG Media Limited

Acronyms and Abbreviations

1G: First Generation Mobile Network
2.5G: Advanced Second Generation Mobile Network
2G: Second Generation Mobile Network
3G: Third Generation Mobile Network
AMPS: Advanced Mobile Phone System
ATM: Asynchronous Transfer Mode
CDMA: Code Division Multiple Access
CLI: Caller Line Identification
**CPI:** Consumer Product Inflation

**CPP:** Call Party Pays

**D-AMPS:** Digital Advanced Mobile Phone System

**DfID:** Department for International Development

**EDGE:** Enhanced Data Rates for Global Evolution

**FAB:** Frequency Allocation Board

**FDI:** Foreign Direct Investment

**GDP:** Gross Domestic product

**GoP:** Government of Pakistan

**GPRS:** General Packet Radio Service

**GSM:** Global System for Mobile Communications

**ICT:** Information and Communication Technology

**IMEI:** International Mobile Equipment Identity

**IP:** Internet Protocol

**IT:** Information Technology

**ITU:** International Telecommunication Union

**M-ISP:** Mobile Internet Service Provider

**MNP:** Mobile Number Portability

**MoC:** Ministry of Communications (Pakistan)

**MoIT:** Ministry of IT and Telecommunications (Pakistan)

**MoST:** Ministry of Science and Technology (Pakistan)

**MVNOs:** Mobile virtual Network Operators

**NGN:** Next Generation Network

**NMT:** Nordic Mobile Telephone

**NTC:** National Telecommunication Corporation

**PDA:** Personal Data Assistants

**PTA:** Pakistan Telecommunication Authority

**PTCL:** Pakistan Telecommunication Company Limited

**SIM:** Subscriber Identity Module

**SMP:** Significant Market Power

**SMS:** Short Messaging Service

**TACS:** Total Access Communication Services

**TDMA:** Time Division Multiple Access

**WAP:** Wireless Application Protocol

**W-CDMA:** Wideband Code Division Multiple Access
**WTO:** World Trade Organisation