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Broadband and

Value Added Services





Broadband Market Overview

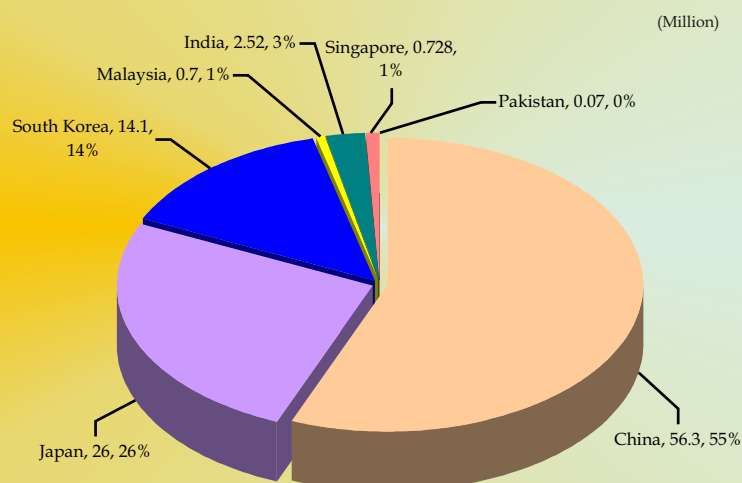
Broadband can be defined as 'always-on' data connection that is able to support a host of interactive & converged services including Internet access. In Pakistan 128 Kbps has been officially defined as the minimum Broadband speed. This is despite the fact that such speeds are incapable of providing acceptable streaming video downloads. Also by world standards, 512 kbps should be the minimum acceptable downloadable rate.

Broadband Internet is one of the fastest growing market segments in Asia. In fact, the region has been leading the world. However, broadband has remained a phenomenon limited to Asia's advanced economies, with dial-up analog modem access still being the standard in many countries. According to some experts, the proliferation of Broadband in these countries has been dedicated to the

availability of local contents. Both, Digital Subscriber Line (DSL) and Cable Modem platforms have proved to be the popular modes of acquiring Broadband connectivity, with DSL having a clear advantage.

China being the most populous country in the region is leading in terms of Broadband subscribers. With respect to the subscriber base, China's share in major Asian countries is more than 56%. Japan comes next and its Broadband users comprise approx. 26% of the Asian market

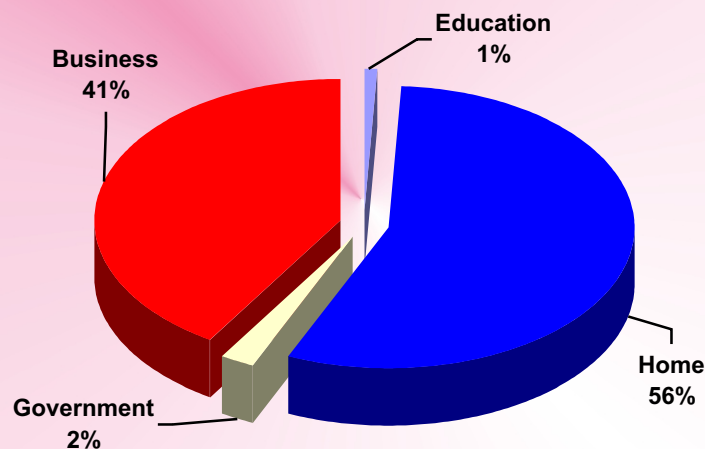
Figure 53
Broadband Subscribers in Asian Countries



Source: IDC, March 2007

According to Organization for Economic Co-operation and Development (OECD) report, among its member countries, 60% of Internet users have now shifted onto broadband. According to the report, countries with extensive fiber networks are offering the maximum BB speeds at the lowest prices. In Japan Internet users are offered 100Mbit/sec connection at USD 22 / month (0.22 dollars (Rs 13.20) per Mbit/sec). Broadband prices for DSL connection across OECD countries have fallen 19 percent during the year 2006.

Figure - 54
Broadband Subscribers by Profession



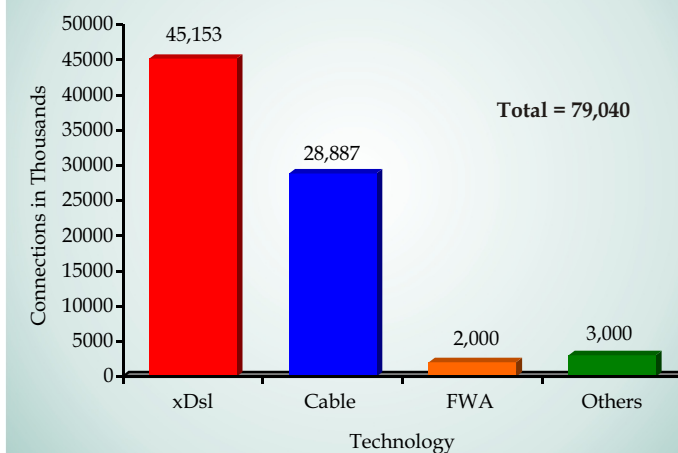
Source: IDC Report March 2007

According to the most recent data from Point Topic's Global Broadband Statistics Service there were 298 million broadband subscribers worldwide at the end of March 2007. The USA remains the largest broadband connected country in the world and passed its own record, exceeding 60 million subscribers. China continues to push hard for the top spot however and has cut the gap with the US from 5.8 million at the end of 2006 to 4.1 million at the end of March 2007 with a total number of 55.9 million subscribers.

Technologies for Broadband in Pakistan

Broadband services can be offered with the help of various technologies. In Pakistan most of the broadband subscription is based on DSL service that is being provided by PTCL, the incumbent operator and other value added service providers. Cable TV is another media which is used to provide broadband services. Worldcall is the lead Cable Modem service provider in Pakistan but limited to two metros i.e. Lahore and Karachi.

Figure - 55
Broadband Market size by Technology



DSL

DSL transfers data on the same copper lines, which are used for normal POTS service. It employs special modems at the network and terminal end to achieve higher transmission rates. Normal voice is transferred on lower frequency band and data on the higher frequencies band. DSL is widely used in most of the regional countries.

DSL is 75% of Pakistani broadband users enjoy DSL BB technology. Major DSL operators in Pakistan are Micronet, Dancom, CyberNet, MultiNet and PTCL.

Cable Modem

Broadband is also delivered through cableTV in Pakistan. 36% of the total broadband market is through Cable modems. Worldcall (pvt) Ltd is the largest provider of Cable Modem Broadband in Pakistan through the use of its HFC network in Karachi and Lahore. Several cable operators, which were providing cable TV services to the customers, have also started the facility of Internet over Cable but they lack QoS and are limited to lower bandwidths.

Fiber to the Home (FTTH)

FTTH technology uses the fiber optic cable to transfer tremendous amount of data, in both directions, in the form of optical signals. Operators have been using fiber at the core side of their networks, however with the commencement of Nayatel FTTH service in Islamabad, fiber has been made available at the access side offering triple play services (Voice, Video and Data) to customers' premises via single fiber optic connection.

Other market players i.e Wateen Telecom are in the process of deploying their FTTH network, it is expected that by the end of this year Pakistan broadband market will have more than one operators offering FTTH technology.

Wimax (worldwide interoperability for microwave access)

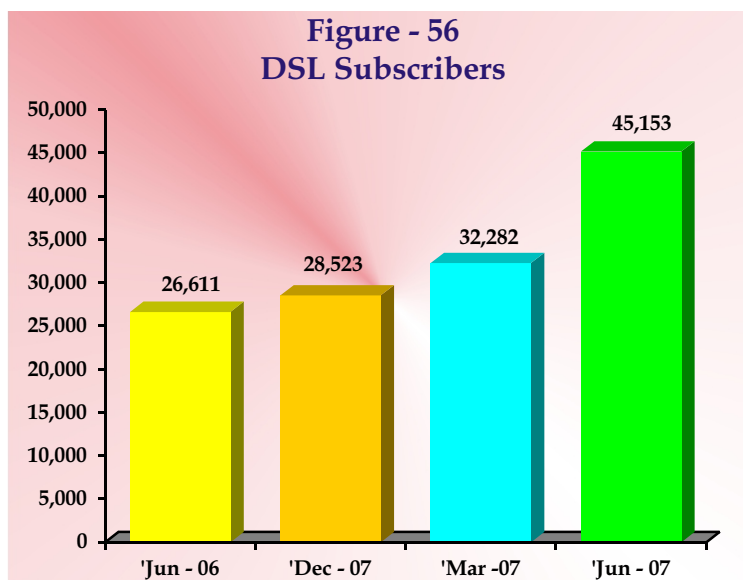
Wimax is the wireless technology that allows transfer of data through point-to-point links or via point to multipoint wireless access. WiMax is among the latest broadband technologies providing high performance and cost effective services. In Pakistan various companies are taking keen interest in deploying WiMax. Positive regulatory steps taken by PTA i.e issuing of technology neutral licenses have facilitated market players to deploy versatile technologies. According to a market report WiMax network built by Wateem Telecom in collaboration with Motorola will be the largest 802.16e based network in the world with over one million users. Wateen Telecom has started online registration of users for WiMax service, it is expected that the service will be available to the consumer by the end of this year. Some other companies like Dancom, Z-Tel, Buraq

Telecom and Mytel are also in process of rolling out WiMax services in various locations of Pakistan.

Broadband in Pakistan

Pakistan's broadband market has been slow despite the fact that services have been available since almost five years. Currently there are a total of almost 79,040 Broadband subscribers which provide dismal picture when compared with other similar economies.

Cost of services is the major reason behind this slow growth. For example in India broadband is available for just US\$8 with 256kbps speed and 2.5 GB download/upload limit per month, however in Pakistan same package is available in US\$24, a difference of US\$ 16 (Rs 960) per month. Indian broadband subscribers are growing at quarterly growth rate of 40% whereas Pakistani market has shown a growth of 15% over the first quarter of 2006-07.



PTA is striving hard to bring down the cost of providing Broadband service so that the service can be made affordable to low income groups. Currently, most of the service is being used by individuals at home or business while the share of education and government departments is quite low.

PTCL since its privatization have twice announced reductions in IP bandwidth tariffs, which are expected to directly benefit the consumers. The new E1 bandwidth rates for Karachi are 1000 US \$ (reduction of 37 percent) and for cities other than Karachi the new rate is 1200 US \$ (reduction of 25 percent cent). PTCL has also dropped copper loop charges for DSL service providers from Rs. 217 per month to Rs. 150 per month (reduction of 30 per cent). It is believed that this reduction will help in proliferation of the broadband market of Pakistan providing affordable Broadband services to the subscriber.

A major development for broadband market is the introduction of DSL services by the incumbent (PTCL) itself. PTCL has started offering its DSL services since June 2007 in major cities; Islamabad, Lahore and Karachi. PTCL offered low tariffs for home users with free installation service. This has

affected tariffs offered by other DSL operators as they have also lowered DSL tariffs in order to remain competitive. According to PTCL sources, since they started of DSL service, 10,000 subscribers have subscribed to their Broadband. It is believed that such competition will flourish the broadband market.

With nine operators offering DSL services in Pakistan, it seems that main emphasis of these operators have been to cover urban areas specially large cities, however one can expect that PTCL having the largest data network will soon start offering DSL services in smaller cities and towns

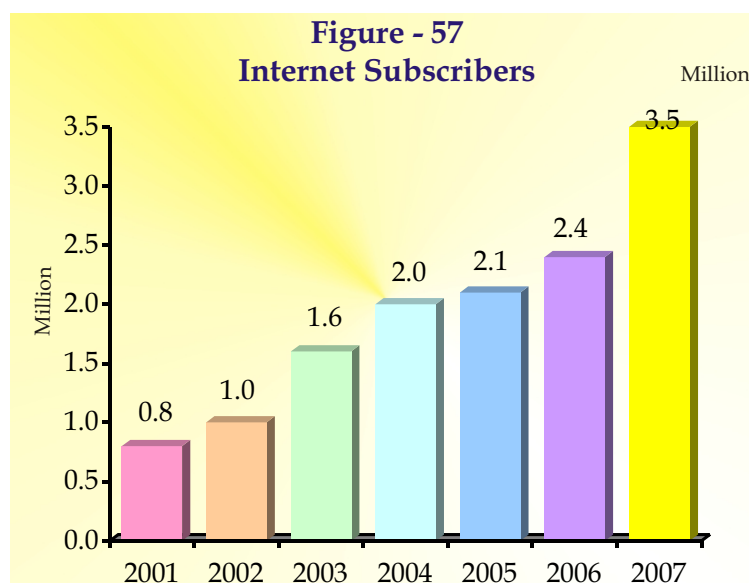
It is expected that steps taken by PTA in collaboration with Industry players will ensure better and economical broadband services in Pakistan. Deployment of Fiber and WiMax Networks will help broadband proliferation particularly in rural areas of Pakistan. It is estimated that there will be 5 Million Broadband subscribers in Pakistan by 2010.

Internet Services

Internet service is becoming an integral part of life in Pakistan particularly in urban areas where large portion of populace using it for different purposes. Most of Air Lines including PIA and Air Blue have started e-ticketing through Internet to provide better and efficient services to its customers. Internet is also being used for educational and entertainment purposes and its use is increasing very fast. Major reason for rapid growth of the service is low

cost of the service which make service affordable to poor strata of the population. Almost 70 companies are providing Internet service all across the country whose quality is being monitored by PTA regularly. Results of the QoS surveys are published in local press to make people aware about the quality.

According to estimates of ISPAK, currently there are about 3.5 million internet subscribers all across in Pakistan where total users crossed 17 million marks. Currently around 2419 cities are connected to internet cities. The internet service providers have to go to rural areas because of saturation in urban areas.



Payphone Services

Payphone is known as the poor man telephony all across the world which provides easy access to people who can not afford to have telephone access at home. It is also a source of self employment in developing countries. Card payphone service in Pakistan was deregulated in 1990s and Telecard is pioneer to introduce this service in Pakistan. Before deregulation, this service became very popular and showed impressive growth. Till the year 2005, this service was being provided mostly through

fixed line network of PTCL. However, after deregulation of the sector this sector has to face tough competition with wireless based and other services whose tariffs have decline to the cost level. In the situation, most companies had to close their business. Telecom regulator took cognizance of the situation and offered incentive to save the industry which is providing employment to a large chunk of population in Pakistan. PTA has reduced its royalty considerably which may give boost to this dying industry.

Growth of the fixed line PCOs remained impressive till 2004-05 where it was growing at an astounding pace. During 2004-05, its growth was recorded at 54% which was highest in last 5 years. However, after 2004-05, growth trend of Fixed line PCOs declined sharply and it registered negative growth of about 36% in 2006-07. Major reason for this negative growth was the replacement of PCOs on wireless based services and tough competition with new operators. Currently, there are 225,980 PCOS on WLL networks while 144,023 PCOs are working on

Figure - 58
Payphones in Pakistan

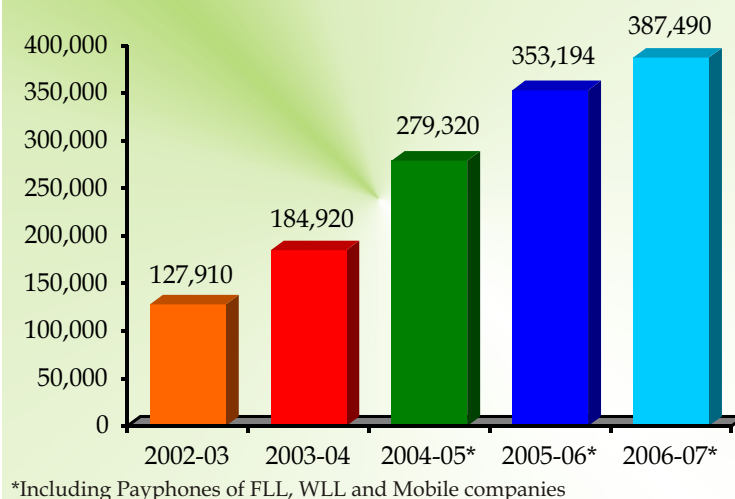
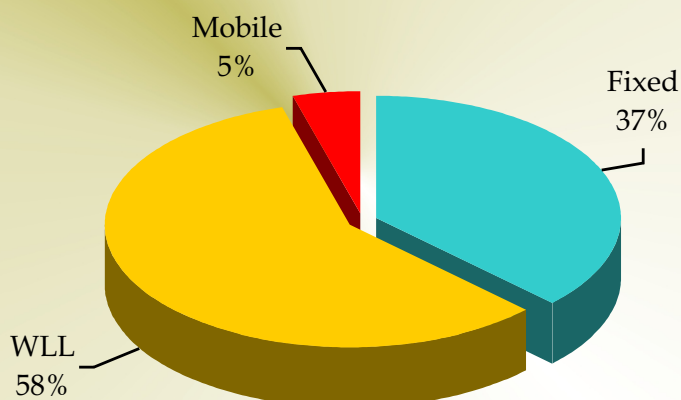
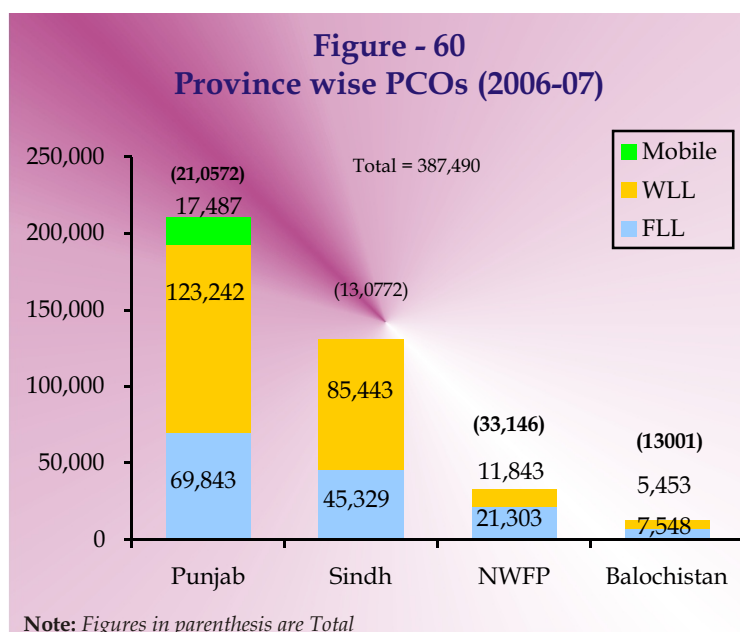


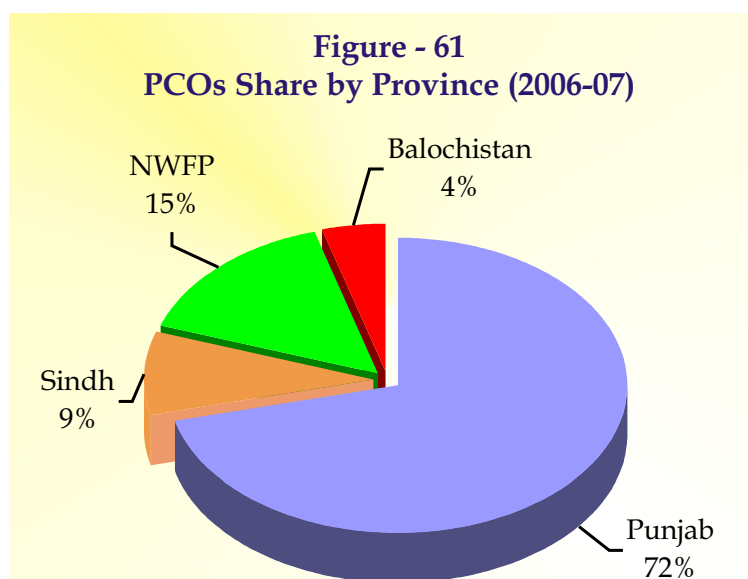
Figure - 59
PCOs Share by Service (2007)



Fixed line networks of PTCL. Currently, Telecard, Worldcall and Great Bear International are offering PCO service on their networks. Overall growth of PCOs remained 10% in the year 2006-07 which was 26% in the year 2005-06. In the year 2006, PTA allowed mobile companies to establish their PCOs where Mobilink has started its PCO service. So far, Mobilink has total of 17487 PCOs.



PCO service is functional in all four provinces where Punjab has the maximum share of 54% in total PCOs (210,572 PCOs). Baluchistan has the lowest share where 13,001 PCOs are working and its share is only 3%. Low penetration of PCO in Baluchistan is due to small population and difficult terrain where it is difficult to provide telecom services. In most of the Baluchistan area, backbone services are not available which is hurdle to provide the telecom services. However, PTA is making concerted efforts to convince new operators to go to Baluchistan. It has offered incentives like 50% reduction in Initial License fee for ISPs and PCO service providers in Baluchistan and it is expected that these services may flourish in Baluchistan in near future.



Market Analysis of CVAS Regime

The CVAS licensing Regime was implemented in October 2005. So far 217 CVAS licenses have been awarded. Out of 217, 156 are Voice Type and 57 are Data type Class Value Added Services licenses while 04 registrations has also been issued. The companies which have earlier been awarded CPP licenses are also converting to CVAS regime owing to the flexibility and benefits it gives. There is a general perception that CPP industry is a dying horse and majority of the CPP

licensees are closing down their services and number of fixed line PCOs are also reducing. However, in the last one year majority of the new companies have applied for Voice Class Value Added services license. This is due to the trend that majority of the operators are approaching mobile Companies to establish Mobile PCOs rather than fixed line PCO. M/S Mobilink has also started provision of Mobile PCO,s after obtaining the permission from PTA. Uptill now Mobilink has approximately installed more than 17,487 mobile PCO,s through out the country. Similarly, Pakistan Telecommunication Authority has given the permission to CMPak, (Paktel) to launch mobile PCO services in Pakistan.

From the current scenario of CPP market it can be forecasted that big CPP operators will survive and smaller operators who could not be able to compete with the bigger operators will find themselves in a difficult position. CPP industry will grow in future and number of mobile PCOs will increase. In the last one year a general trend in Data CVAS licenses has been observed that majority of the companies have applied for Vehicle Tracking Services (VTS) license. So far PTA has issued 25 VTS license to the various companies and few other applications are in process. It is forecasted that this industry will also grow in the coming years.

Further Simplification of CVAS Licensing Regime

In the past, PTA had been following the pattern of issuing a license for every value added service. For the post deregulation era licensing regime of value added services was simplified by combining the services into two main licenses, the “Data Type” and the “Voice Type” with third category as “Registration”. The new regime gave advantage to the new licensees by having the flexibility of providing number of services under one license. It also benefited PTA, as fruits of liberalization were seen reaching the customers and the competition increased.

Internationally the world is moving towards convergence, the convergence of technologies and convergence of regulations. The CVALS licensing regime introduced in late 2005, however, some services offered under the license never became popular with the service providers while on the other hand some new services emerged. Therefore, the licensing regime has been further simplified as shown in Table 23.

Table - 23 Current CVAS Regime		
Data Type Services	Voice Type Services	Registration/ Services
Internet Service	Card Payphone Services	Voice Mail
Vehicle Tracking System	Premium Rate Service	SMS Aggregator
Data Services	—	Content Service Provider Video Conferencing

Some of the obsolete services like teletex, store & forward fax and burglar alarm services have been

removed from CVAS. These services have become unpopular in Pakistan.

Award of New CVAS Licenses

During the last year PTA processed a total of 90 applications for award of Class Value Added Services licenses. Out of which 86 licenses have so far been issued whereas 04 applications are still under process for want of completion of formalities / observations. Licensing Division has also processed a total of 09 applications for conversion of old VAS licenses to CVAS licenses. All the request were processed and new CVAS licenses were issued.

Conclusion

Considering the low penetration of broadband in Pakistan, PTA is taking steps for the faster growth of this important service. PTA has already issued determination where it has reduced the bandwidth tariffs considerably. It will help to reduce the cost of doing business in broadband sector in Pakistan. The incumbent operator, PTCL has also started broad band service. Some of the new players are deploying WiMax in Pakistan while few others are deploying FTTH networks and it is expected that by 2010 broadband subscribers in Pakistan will reach to 5 million. Considering a convergence of services in international market, Pakistan has further simplified its CVAS license and it is expected that VAS services will further grow in future.