

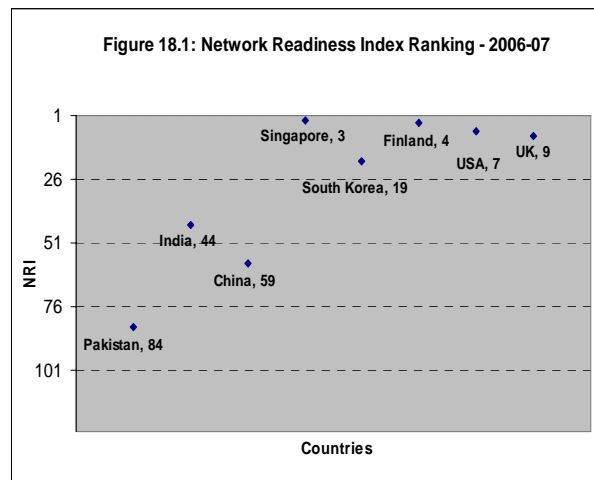
Chapter 18

Information and Communication Technologies

A. Information Technology

No work of science has ever produced such an over whelming influence on the course of human development as that by the Information Technology (I.T.). I.T. is changing every aspect of human life, be it trade, services, manufacturing, government, education, research, entertainment, culture, defense or communications etc. It is breaking old barriers and building new interconnections in the emerging global village. It has now become the determinant of the progress of nations, communities and individuals.

The Information Technology as a tool possesses the potential to overcome the historical lag in development through leapfrogging and enabling Pakistan achieve the **vision** of becoming a strong, prosperous and developed nation in near term. ICT is also the fastest growing sector in the world today and has been envisaged as the most revolutionary tool of the knowledge based society of tomorrow. The developed countries being fully aware of its strength are transforming their economies towards knowledge in a big way. This will also equip them to sustain the fierce competition envisaged under the WTO trade regime. Resultantly, other emerging economic powerhouses around the world are also moving towards this transformation and applying information technology for their development. This global prominence of information technology is also having an impact on Pakistan. As a consequence, development of information



Source: Global Information Technology Report 2006-07

technology has become one of the top priorities of Government of Pakistan. It aims to place the country as one of the front runners in the race of IT accomplishments and to transform the country to knowledge based society. However, a long distance is still to be covered which is also substantiated by a comparison of Networked Readiness Index (NRI) ranking of selected countries. (Figure 18.1).

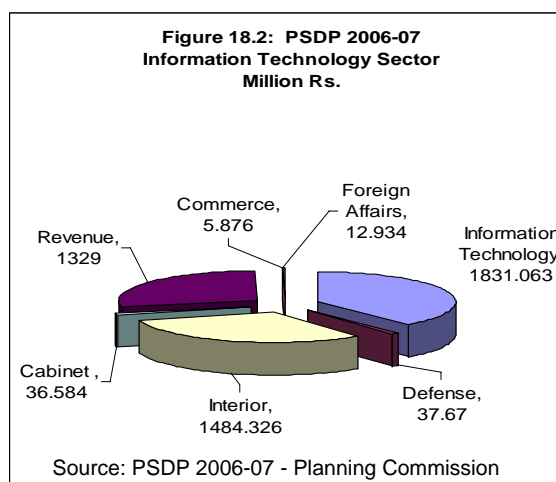
Medium Term Development Framework (2005-10)

A sizeable sum of Rs. 19.4 billion has been earmarked for the information technology in the Medium Term Development Framework to be utilized mainly for establishing I.T. infrastructure, human resource development, development of E-Government and citizen centric software applications together with implementation, development of enabling environment including legislation, regulation etc. and promotion of software exports. The rest of the activities will be taken up by the private sector.

Review of 2006-07

Financial

In the Public Sector Development Programme 2006-07, an amount of Rs 4,737.45 million was allocated for Information Technology Sector for 105 projects. These projects were executed by various Ministries/ Divisions that included Ministry of Information Technology, Ministry of Interior, Ministry of Defense, Ministry of Commerce, Ministry of Foreign Affairs, Cabinet and Revenue Divisions. The graph shows the distribution of PSDP allocation among the Ministries/ Division for the year 2006-07. Utilization in 2006-07 was about 41% of allocated funds. (Figure 18.2)



Physical

The major achievements for 2006-07 are delineated below:

a) Human Resource Development

Educated human resource is the main catalyst of growth in using information technology. For this we need to rapidly increase the base of primary, secondary and tertiary educational institutions having computer education facilities. India produces 2.5 million graduates a year and yet faces a shortage of about half a million I.T. professionals. Pakistan on the other hand produces about 20,000 graduates while there is a demand of about 50,000 graduates a year which is projected to grow to 155,000 per year in 2010.

The Government is focusing on both long-term and short-term human resource availability for this sector. For the long-term, projects have been launched to build capacity at the schools/ college level. In the shorter period, focus has been laid on upgrading skills of public as well as Government employees for effective use of the computer-based systems being developed for the Ministries/Divisions. Major projects executed during 2006-07 for human resource development include:

- **I.T. Computer Science Teachers, Lab Incharges and Computer Labs Project – Matching Program with the Provinces, AJK, FATA/FANA and ICT** is nearing completion.

Under this program, computer labs have been established in 1,098 secondary/high schools/ inter-colleges which were equipped with about 17,500 PCs. Also, 1,098 computer teachers and 1,098



laboratory incharges were employed. About 44,000 thousands students from all over Pakistan have now the opportunity to learn the subject of Computer Science/ Information Technology at the level of classes 9 to12.

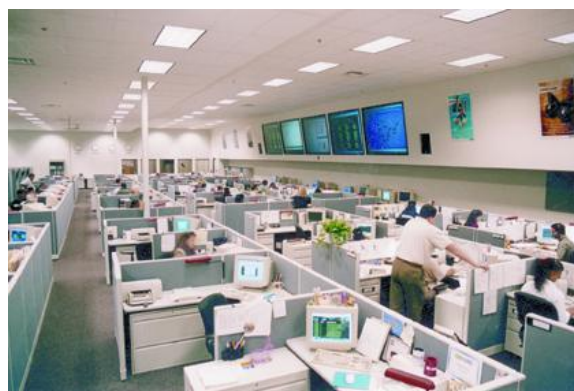
- **Introduction of Computer Education in 81 F.G. Model Colleges and Schools in ICT, Islamabad (Phase-II)** is underway and computer teachers, lab incharges and lab attendants have been employed for the purpose. The project will be completed in November 2008 and with this, all public schools and inter colleges of Islamabad will have I.T. labs and teachers.
- **Pilot Project for End-Users and System Administrators – Training on Open Source Software** was conducted to raise the skills in the use of open source software. More than 4,000 persons were provided with end-user training and about 750 people were trained as Linux system administration experts.
- **Basic Information Technology Training** aims at improving the IT literacy and skills of Government servants to carry out office work and training was imparted to about 10,000 Government employees.

b) Information Technology Industry Development

I.T. exports amounting to US\$73 million approximately were made in 2005-06. For 2006-07, target of I.T. exports was US\$108 million which is expected to be achieved. During the current year, the electronics and IT exports from India are estimated at US \$36.67 billion (of which IT and ITes exports amount to US\$ 17.2 billion) To compete in the international markets, Pakistani companies were encouraged to adopt best practices and get international certifications.

For strengthening the local information technology industry to compete in the international markets, following projects were executed during the year:

- **Standardization of Pakistani Software Industry.** Programs to get internationally recognized certifications (like CMM, CMMi, ISO 9000, COPC etc.) by local companies were initiated. 20 companies under this program are in the process of obtaining CMMi certification. Presently, 5 companies are already CMM assessed in the country (1 CMM Level 5, one CMM Level 4, two CMM Level 3, one CMM Level 2) and about 100 companies are ISO certified.
- **Automation of Domestic Industry on Open Source Systems** This project was initiated to encourage local companies to develop expertise in open source arena as well as provide automation at low cost for domestic industry.

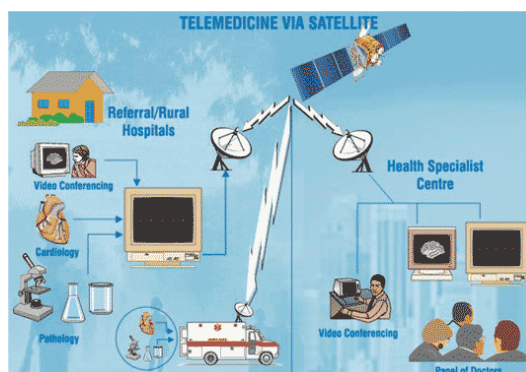


- **Development of Software Technology Parks** provide better infrastructure facilities and space at attractive costs for firms to do I.T. business in Pakistan. All schemes relating to the establishment of IT parks were put on fast track.

c) E-Government

Government continues to pursue its policy of improving its efficiency and facilitating its citizens through information technology. The e-government program covered computerization of Ministries as well as extending its services to the public. The major e-government projects executed/approved during 2006-07 included the following:

- **Establishment of Federal Government Data Center and Intranet** provides the basic fabric for interconnectivity among the all the Ministries/ Divisions to enhance internal efficiency and effectiveness of the Government.
- **Replication of E-Office at all Divisions of Federal Government** provides the Ministries/ Divisions with automated applications for inter-office communication, human resource management, procurement, inventory, finance and budgeting and project management.
- **Land Revenue Records Management System for Punjab** will provide for efficient management of land records and will facilitate the citizens to have access to land records at affordable cost.
- **Health Management Information System at PIMS** provides efficient management of health records of the patients and facilitates them in having easy access to hospital services.
- **Automation of Shaikh Zayed Hospital** provides better health information and facilitation to the patients.
- **Machine Readable Passport/ Machine Readable Visa Project** is being implemented for deployment of MRP System at 41 RPOs and 108 Foreign Missions.
- **Automated Fingerprint Identification System** for online comparison/ identification of criminals through fingerprints is being implemented to combat terrorism and crimes.
- **Online Recruitment System for Federal Public Service Commission** facilitates the citizens to access various services of F.P.S.C. and apply online for jobs.
- **E-services at Chief/ Deputy Commissioner Office, Islamabad** provides access for various services to the citizens, thus facilitating interaction between citizens and the Commissioner's office.



Critical Analysis and Recommendations

Education & Human Resource Development

The most important factor in sustainable growth of information technology is the human resource. A strong focus on quality I.T. education will be very helpful for not only meeting the domestic demand but also to cater for the international requirements since the trained human resource is a very good source of foreign remittances.

We therefore need to rapidly increase the base of primary, secondary and tertiary education in terms of quantity as well as

quality at all levels. An efficient educational system needs to be put in place in which thinking; innovation and creativity are encouraged and promoted. For inculcating these traits in the students, teachers must be trained in the latest teaching methodologies. I.T. needs to be introduced at all levels; e.g. tertiary, secondary/higher secondary, middle and finally primary in descending order of priority. Also, incentives in the shape of scholarships need to be offered to the talented students for promoting I.T. education.

Currently about 1,100 secondary/ high schools/ inter-colleges (10% of total high schools/ inter-colleges) in the public sector possess facilities computer education including computer labs and teachers. In order to cover all the existing public sector high schools/ inter-colleges, an amount in the range of Rs. 17-20 billion is required. If all the existing middle schools are also to be covered then funds amounting to Rs. 55-60 billion will be needed.

After hectic efforts of Pakistan Computer Bureau, Ministry of I.T., a body namely "National Computing Education Accreditation Council (NCEAC)" has been established within the Higher Education Commission for standardizing and improving the quality of I.T. education and ranking the Universities in order of their quality of education. The initial achievements of NCEAC include (a) the course materials of various I.T. degrees namely (i) Computer Science (ii) Information Technology (iii) Software Engineering have been standardized; (b). all the Universities offering degree courses in the field of "computing" have been forced to only offer four years bachelor's degrees (130 credits) and two years masters degrees (32 credits) failing which their degrees will not be recognized. The sub standard IT degrees have thus been discontinued. (c) work on the ranking of Computing degrees which needs to be carried out objectively and impartially, is almost completed.

Strengthening education centers for developing skills in human resource is required for meeting the requirements in the short-term. These centers should focus on providing training of I.T. skills in high demand as well as niche areas of information technology. Some mechanism of registration and quality control of the training institutes needs to be put in place. Also, projects for improving I.T. skills with increased outreach of I.T. institutions need to be implemented.

Box 18.1: Recommendations for Human Resource Development

- Providing computer labs and computer teachers in secondary schools.
- Upgrading teaching skills of I.T. teachers.
- Scholarships for I.T. education.
- Establishing Centers of Excellence for I.T. Training.
- Implementing projects for upgrading I.T. skills with increased outreach of I.T. institutions.
- Establishing I.T. Placement Centers for exporting trained I.T. manpower.

In order to provide overseas employment to the trained I.T professional, I.T. Placement Centers can play a pivotal role. Therefore, placement centers should be established specifically for exporting I.T. manpower seeking overseas opportunities. Effectiveness of these placement centers can be enhanced by creating strong linkages between them and I.T. institutes.

Information Technology Exports

For 2006-07, the estimated I.T. exports are around US\$120 million, which is very low as compared to IT exports by other countries. For example, Canada's IT exports were US\$ 31 billion in 2006 (*Source: Industry Canada*), Ireland's IT exports reached US\$24.9 billion (*Source: OECD Factbook 2007: Economic, Environmental and Social Statistics*) and India's IT exports are estimated to reach US\$ 36.67 billion in FY2007 (*Source: NASSCOM, India*).

For increasing the software and I.T. exports, more needs to be done. In this regard, besides attracting large multinational businesses in the country, local entrepreneurs and investors in large numbers are required to be attracted to give impetus to this nascent sector. For this purpose development of I.T. incubators to establish I.T. companies and venture capital funds should be vigorously encouraged by providing them with 'one-window-facilitation' to start their business. A government-backed program to establish I.T. incubators should be designed on lines similar to Building on IT Strengths (BITS) Program under which ten IT incubators were established with the support of Australian Government.

Box 18.2: Recommendations for Development of I.T. Industry

- Encouraging development of I.T. incubators
- Mergers, acquisitions, joint ventures with foreign software houses to build world-class companies.
- Incentives for remitting earning in the shape of foreign exchange.
- Incentives for achieving CMM Level 5.
- Establishing Internet City and Knowledge Village to achieve critical mass of high technology companies.
- Developing computer hardware industry
- Abolition of Sales Tax on computer hardware equipment and software.

To attract large international businesses, the local IT companies need to complement their expertise as well as augment their capacity through clustering as well as mergers/ acquisitions on successful business propositions. Mergers, acquisitions and joint ventures with foreign software houses also helps in the promotion of software development, software business and transfer of technology. A proper mechanism to incentives the system needs to be put in place by the Government. This will enable the local companies to transform into world-class companies.

The international businesses now focus on adopting best practices to ensure delivery of quality services and products. The local I.T. companies should be encouraged in this direction. For this purpose, incentives such as tax concessions/ rebates should also be given to local I.T. companies (in addition to the existing subsidy on CMM training) for achieving CMM Level 5, opening offices overseas and for earning foreign exchange from software exports.

Silicon Valley, USA, Multimedia Corridor in Malaysia, and Internet City in Dubai are examples that have led to the growth of IT industry in the respective countries. A Multimedia/ Internet City and Knowledge Village in Pakistan on similar lines will help

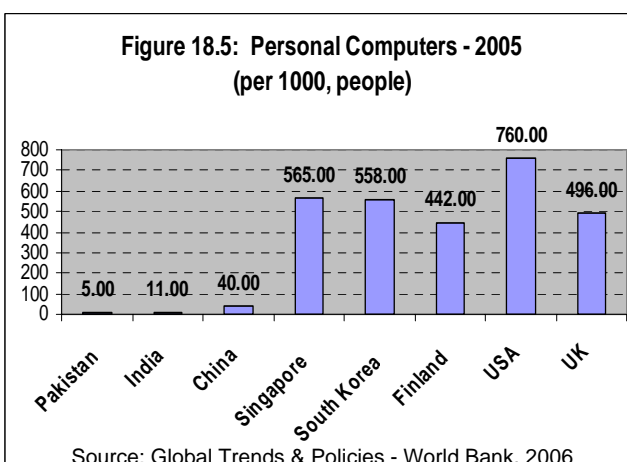
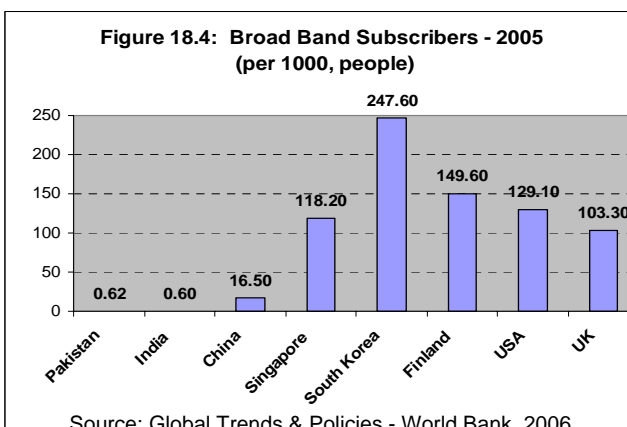
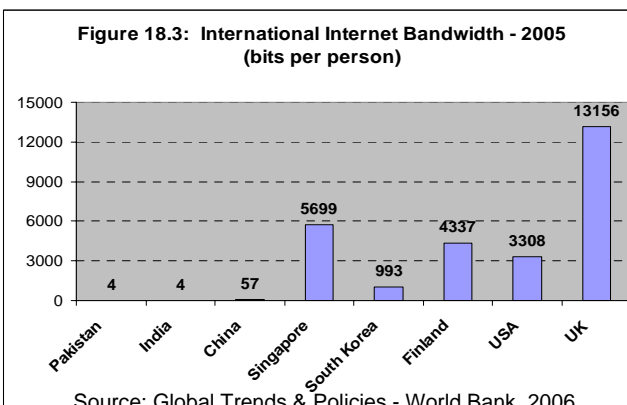
to attract large software companies and multinationals to build their offices locally. These places may be treated as Tax Free Zones. Further, this will act as a hub for value-added activities such as multimedia content development, animation, computer games, knowledge creation, etc.

E-commerce

E-commerce is the main pillar on which the knowledge-based economy stands. In Pakistan, E-commerce is still a long way to be seen at a recognizable level. In this regard, many issues will have to be addressed that include expansion in connectivity infrastructure, introduction of Public Key Infrastructure (PKI), implementation of laws related to electronic transactions, data protection and cyber crimes so that confidence is built up for doing business using this medium. Pakistan's position in this regard is not encouraging (Figure 18.3 and 18.4).

Computer Hardware Industry

Pakistan's computer hardware industry requires more attention to make it a vibrant sub-sector of the overall I.T. industry. To promote it, computer hardware firms equipped with after-sales maintenance/ repair workshops/ labs employing qualified I.T. professionals and having country-wide presence should be preferred for award of large Government contracts. Also, there should be total tax concessions/holiday for OEMs companies and manufacturers of computer hardware components (e.g. storage media, networking equipment, keyboards, etc.) for a period of next 15-20 years. Similarly, sales tax on computer and allied equipment needs to be removed to provide impetus to rapid growth in access of information technology and services in the country. It will also help in broadening the ownership of PCs, as currently, Pakistan has a very small base of PCs as compared to other countries (Figure 18.5).

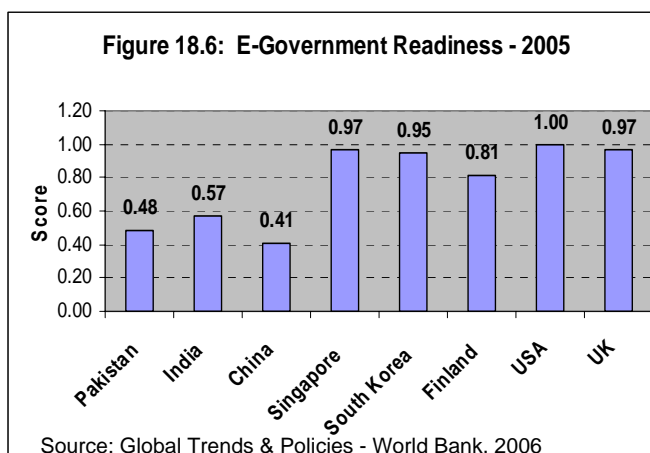


E-Government

Emphasis on e-government initiative continues since the year 2000 when M/o I.T. was established. However, this initiative is still in its developmental stages. A concerted effort and continuous ownership of this initiative at the highest level is needed to make it successful. Currently, in e-readiness, Pakistan stands in the middle as compared to other countries of the region and Asia. (Figure 18.6)

For e-government initiative to take its roots within the government offices, proper I.T. Sections in each Ministry are required to be established. These I.T. Sections would cater to the requirements of

updatation of websites, network management, hardware maintenance, IT training and business process re-engineering. The IT Sections of each Ministry should have I.T. professionals with appropriate educational background and skills to handle these tasks. The existing I.T. Departments working under the Ministry of I.T. also need to be restructured and upgraded to cater to the enhanced I.T. requirements of the Government.



Development of I.T. Cadre

A major issue in the sustainability of e-government projects is retention of I.T. professionals in the long run as the private sector is offering very lucrative packages for the same skills and experience level. To attract I.T. professionals in the public sector, development of an I.T. Cadre at competitive salaries based upon performance is essential. The I.T. Cadre is also necessary to remove disparity between contract and regular employees. This will help in motivating I.T. professionals to join public service as a long-term career.

Box 18.3: Recommendations for Sustainability of E-Government Initiative

- Proper I.T. Sections in each Ministry inducting qualified I.T. professionals.
- Development of I.T. Cadre at competitive salaries based upon performance.

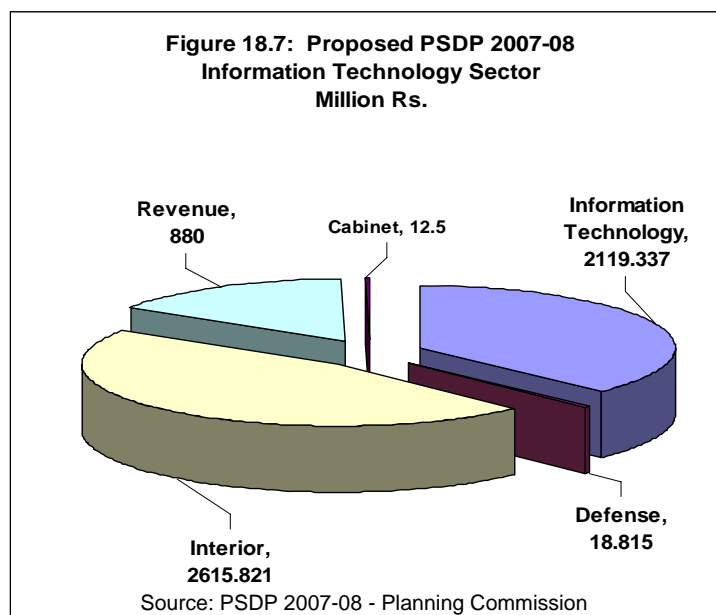
Programme for 2007-08

Financial

In the Public Sector Development Programme 2007-08, an amount of Rs. 5,646.47 million has been earmarked for Information Technology sector for 115 projects. The government thus continues to increase its funding for the Information Technology sector. The graph shows the distribution of funds allocated for I.T. projects among the Ministries/ Division for the year 2007-08. (Figure 18.7)

Physical

The Public Sector Development Programme (PSDP) earmarked for 2007-08 will further enhance the human resource development, I.T. industry development, E-Government, infrastructure development, and will create employment opportunities in the I.T. sector. In this regard, 115 information technology projects will be executed in 2007-08. Major thrust in I.T. for the 2007-08 will be as follows:



a) Human Resource Development

In 2007-08, focus on human resource development related projects will continue to be on provision of I.T. training to public and government employees and establishing computer labs and provision of I.T. teachers in high schools/ inter-colleges. Following are the significant new projects to start in 2007-08:

- Strengthening of Industry through International Certification of I.T. Companies.
- IT Computer Science Teachers, Lab Incharges and Computer Labs Project- Matching Program with Government of Punjab, Sindh, Baluchistan, AJK, FATA/FANA & ICT (Phase-II). Under this program about 3800 high schools/ inter-colleges will be provided with I.T. Teachers, lab incharges and equipped with computer labs.
- Pilot Project for End Users and System Administrators Training on Open Source Software will provide training to 1000 persons in system administration and 3000 end-users.
- Standardization of Pakistani Software Industry on CMM and CMMI.

b) Information Technology Industry Development

Software Technology Parks (STPs) that have been established in various cities of the country are being used by many well-known companies for doing their business. Currently, in 11 STPs about 750,000 sq. ft. operating office space is being utilized. In PSDP 2007-08, emphasis on improving the IT infrastructure will continue so that more international IT companies are attracted to do business in Pakistan alongside the domestic I.T. companies. In this regard, some of the important new projects include:

- Purchase of Land in Karachi and Lahore for Establishment of IT Parks will be made to facilitate more I.T. firms to establish their businesses in the country.
- Establishing Software Technology Park at Islamabad will create further capacity to cater to the increasing demand of establishing I.T. businesses.
- ISO certification of PSEB will strengthen its capability to carry out its functions more efficiently.
- PSEB Venture Capital Fund will be established to invest directly into high-tech firms in the IT and telecommunications sector.

c) E-Government

E-governance projects will continue to be the center-piece of information technology initiative. The major new e-government projects in 2007-08 include:

- Establishment of Federal Government Data Center will be completed, which will provide connectivity to all Federal Ministries/ Divisions.
- Basic Infrastructure including local area networking, hardware and software will be provided across all departments of the Federal Government to enable them to function in an interconnected and automated environment.
- Replication of E-Office at all Divisions of Federal Government will be carried to provide automated systems for inter-office communication and other common functions at these Divisions.
- Systems will be developed for universal access of Federal Government Services to the citizens.
- Health Management Information System will be replicated in the Federal Govt. Hospitals to provide better health care facilities to the citizens.
- Automation of Pakistan Railways (ERP, SCP & CRM) will enhance the internal efficiency and effectiveness of the organization.
- Federal Government E-Procurement System will be developed to make the procurement process at the Federal level more efficient and transparent.

B. Telecommunication

In the last two decades telecommunication has evolved into a dynamic global business sector driven by mobile services, data transmission, Internet, e-government and e-commerce applications. Thus, it has led to the emergence of networked environments acting as catalyst of social change as well as becoming the backbone of global information economy.

Competition and private sector-led markets in many countries are making telecom services available to everyone. In Pakistan too, the growth in telecom sector has been phenomenal due to successful de-regulation and privatization policy of the Government.

Review of 2006 – 07

Presently there are two telecommunication organizations working under the government umbrella namely National Telecommunication Corporation (NTC) and Special Communication Organization (SCO). During the process of privatization of PTCL, NTC was created to take care of the Government's telecom needs. NTC at the moment operates about 108 exchanges in the country whose total installed capacity is 120,000 and total working connections are 97,000. SCO presently operates about 191 exchanges with total installed capacity of 318,029 and total working connections of 219,013.



The important projects executed by **NTC** during the year are as follows:

- **NGN deployment of media gateways at NTC POPs** in 21 cities worth Rs. 168 Million. This project was used to migrate from traditional TDM core Network to the state of the art IP core Network. To reduce interconnect charges and efficiently use already congested long haul media. To have the network capable of supporting triple play.
- **Lahore Optical fiber Junction Network of 50 Km** worth Rs. 52 Million. The objective of this project is to establish NTC's own junction network. Dependency on other operators for provision of media was eliminated thus large revenue would be saved.
- **Optical fibre Excess Network at Chasma (PAEC)** worth Rs. 11 Million. This project would provide the state of art telecom facilities to Pakistan Atomic Energy Commission.
- **Deployment of 32 new exchanges** with 17,000 lines worth Rs. 900 Million. With the completion of this project in various cities 17,000 new connections would be operative on NTC network.

- **Replacement of VIP trunk board** worth Rs. 14 Million. The objective of this project was to facilitate NTC customers with NWD call booking facility as previously it was dependent on PTCL to provide customer care services.
- **Up gradation of SDH junction in Islamabad** worth Rs. 25 Million. This project would enhance the existing capacity at Islamabad Junction from 622 Mbps to 2.5 Gbps. This would cope with the growing media requirements.

The projects executed by **SCO** during the year are as follows :

- **Laying of OFC between Gilgit & Skardu** worth Rs. 198 Million. In this project Optical Fibre Network was laid between Gilgit & Skardu which would facilitate the telecom facilities in Northern Areas.
- **Expansion & Improvement in Northern Areas** worth Rs. 669 Million. This project would provide the state of art facilities in telecom in Northern Areas.
- **GSM Project for AJK & Northern Areas** worth Rs. 450 Million. This project would provide the latest GSM technology in AJK & Northern Areas.
- **Rural Digital Communication in AJK** worth Rs. 1,486 Million would provide a new digital system and network in AJK.
- **Inter transit main exchanges in AJK** worth Rs. 199 Million for provision of transit exchanges in AJK.

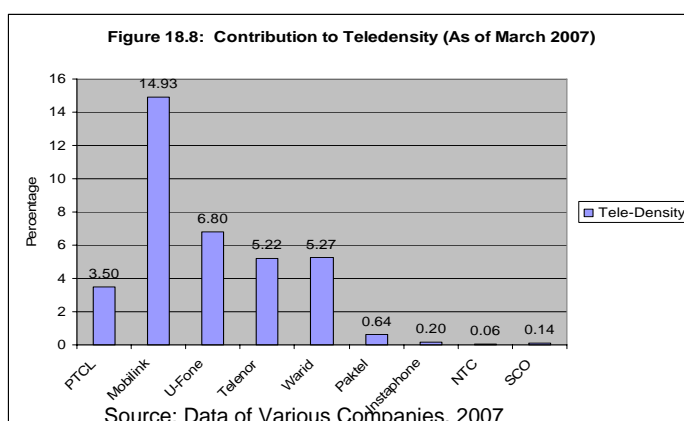
Performance of Private Companies in 2006-07.

Presently there are 7 large private companies operating in the country namely Mobilink, Telenor, Warid, PTCL, U- Fone, Instaphone and Paktel. Data was collected from these companies which showed the following results as of March, 2007. Table 18.1 and Figure 18.8 are referred.

Table 18.1: Performance of Telecom Companies 2006-07 (As of March 2007)

Fixed Lines							
No.	Company Name	Installed Capacity	Working Connections	Tele Density	Exchanges or Cell Sites	Switch Systems	Facilities Offered
1	PTCL	6,160,192	5,601,798	3.50	2,854	Siemens Alcatel Ericsons ZTE	Fixed Lines Telephones Card Payphones = 198,225 NWD Stations = 2,500 UIA= 2,426, V PCO = 1380
2	NTC	120,000	97,000	0.060	108	ZTE, Siemen	Fixed Lines Service
3	SCO	318,029	214,109	0.133	191	Huwei, ZTE	Fixed Lines, WLL
TOTAL :		6,598,221	5,912,907	3.693	3,153		
Mobile Operators							
1	Mobilink	25,000,000	23,882,013	14.926	5,100	Siemens Alcatel, NEC	Post Paid (Indigo),(Jazz) Phone, SMS, Web
2	U - Fone	12,000,000	10,886,123	6.804	1,015	Siemens	Pre Paid, Post Paid
3	Telenor	10,000,000	8,344,570	5.215	1,100	Swedish	Post Paid, Pre Paid
4	Warid Telecom	9,000,000	8,425,693	5.266	970	GSM	Post Paid, Pre Paid
5	Paktel	1,700,000	1,030,883	0.644	960	GSA	Mobile services
6	PTCL (WLL)	1,957,500	950,686	0.594	1,110	ZTE	Wireless Local Loop
7	Instaphone	500,000	314,871	0.197	250	GSA	Mobile services
Total :		60,157,500	53,834,839	33.646	10,505		

Source: Data Collected from Various Companies, as of March 2007

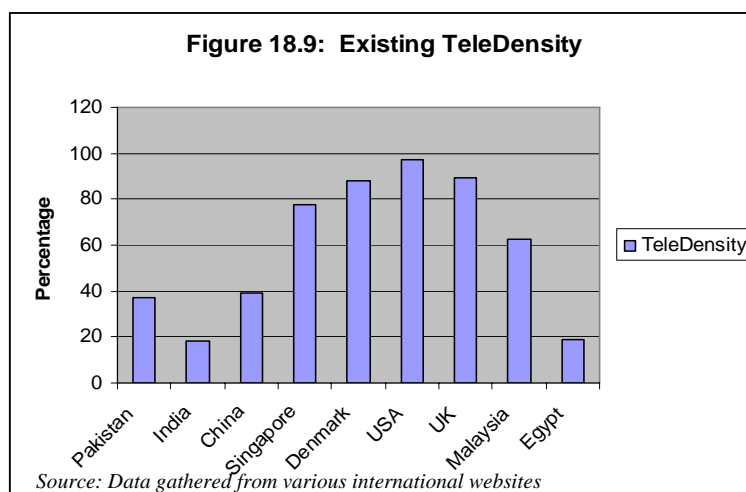


Presently the tele-density in Pakistan stands at 37.34 (fixed + mobile) whereas last year i.e. 2005-06 this tele-density was only 26.21 (fixed + mobile). For comparison purposes, tele-density of some of the important countries is given below:-

Table 18.2: Teledensity – Cross Country Comparison

Country	Tele Density	Country	Tele Density	Country	Tele Density
Pakistan	37.34	India	18.24	Malaysia	62.31
China	39.32	Singapore	77.81	UK	89.36
Denmark	88.32	USA	97.32	Egypt	18.89

Source: Data Gathered from various international websites



The total number of connections has increased by 11.9% in 2006-07. With the present pace of growth in this sector, it is expected to achieve universal coverage by the year 2017. However, it will not be possible in view of limitations of affordability and literacy.

Programme for 2007 -08

In the next year **NTC** plans to execute the following projects

- **Establishing Coastal Communication Link** worth Rs. 627 Million. In this project Optical Fibre based transmission link (2.5 GB/S) would be established along the coastal highway.
- **High Performance Secure Network Architecture (HPSNA), for NTC at Islamabad** worth Rs. 198.740 million.
- **Shifting of GHQ circuits from PTCL to NTC Network (Phase-I)** worth Rs. 877.390 Million.
- **Provision of PSTN Legal Interception Facility by NTC** worth Rs. 78.036 Million to intercept hacking etc.
- **Video Conferencing for GOP at 14 sites** worth Rs. 39.437 Million.

In the next year **SCO** is planning to execute the following projects:

- **Interconnect Billing & Customer System** worth Rs. 580 Million will provide an efficient Billing & Customer care centre for AJK & Northern Areas.
- **Global System for Mobile (GSM) expansion for AJK** worth Rs. 565 Million to provide expansion and up gradation of existing GSM system in AJK.
- **Laying of OFC between Gilgit & Mansehra** worth Rs. 286 Million for installation & commissioning of Optical Fibre between Gilgit & Mansehra
- **OFC Connectivity Gilgit-Gupis-Sist** worth Rs. 199 Million will provide an Optical Fibre Cable network between Gilgit, Gupis and Sist.
- **Northern Areas Terrestrial Link** worth Rs. 178 Million to establish a terrestrial link network in AJK & Northern Areas.