IT Policy and Action Plan

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Ministry of Science & Technology
Government of Pakistan
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1.   Executive Summary

Information technology (IT) has assumed unprecedented importance in the global economic arena. In Pakistan, the present Government is according a very high priority to this sector. One of the prerequisites for ensuring sustained growth of the industry, nay the economy, is the provision of a definite framework consisting of policy, legislative, financial, and operational guidelines, which can provide a stable umbrella for growth. Thus, the government, as the main facilitator, enabler, and promoter of the IT sector, has evolved an effective national IT Policy and Action Plan that clearly caters to the needs of nurturing the industry and is responsive to the dynamic forces of change that can affect its future growth. The Private sector is being brought into the mainstream as the main driver for growth.

The guiding theme for the Policy is that 'the Government shall be the facilitator and enabler to encourage the Private sector to drive the development in IT and Telecommunications'. This one single element has galvanized the entire Pakistani IT community to participate wholeheartedly in the process and over 200 professionals mainly from the private sector participated in various dialogues and eleven Working Groups meetings over the last four months to devise a comprehensive Policy and Action Plan document.

The vision of the Policy is to harness the potential of Information Technology as a key contributor to development of Pakistan and the broad-based involvement of the key stakeholders is a must for its sustainable development. Core IT Policy strategies have been proposed under several focus areas and some of the lead recommendations in each area are as follows:

i.   **Human Resource Development:** Human Resource (HR) Development is imperative for the local IT industry to position as an important player in the international IT market. Under the HR Action Plan, a large pool of academically as well as technically skilled IT manpower would be developed to meet the local and export needs. The Policy accordingly envisages the establishment of four new IT Universities, Virtual IT University, National Testing and Accreditation Services and Educational Intranet, strengthening of existing IT Institutes and hiring of Faculty from abroad. A major portion of the funds under IT Action Plan would be dedicated towards HR development initiatives.

ii.   **Infrastructure Development:** The local IT industry requires a world class enabling infrastructure. An exercise for deployment of this infrastructure would be under taken and a series of IT Parks and Incubators across the country would be established. These Parks will be equipped with modern facilities and matchless incentives, to provide a one-stop shop for prospective investors in the IT industry. Telecom infrastructure would be modernized to carry broadband access in the backbone and local loops. Other steps include the establishment of IT Boards in provinces (except Punjab where it exists already), increasing teledensity and introduction of new technologies such as wireless local loop for data and cable Internet.

iii.   **Software Industry Development:** Software development is a high growth industry and forms a major segment of the vast IT market and will continue to do so in the future. Integrated efforts to develop software industry with focus on exports (in addition to the

local market) would be undertaken. This would include encouragement of local software houses in Governmental projects, local content development, Urdu and regional language software development, promotion of software exports through establishment of International Marketing Network, special bandwidth rates for software exporters, encouraging joint ventures, hiring of international consultants for global business development and fiscal and regulatory incentives for software exporters through State Bank of Pakistan.

iv.   **Hardware Industry Development:** The policy recommendations in the area of hardware industry development do not seek to initiate aggressive competition with the developed countries. Rather, they focus on developing the areas that are within Pakistan's reach, in terms of technology and resources and in which the country could have a competitive advantage. Major recommendations include the waiver of duties and taxes on the hardware, incentives to reduce the cost of raw material and inputs, encourage and fund research and development in the Universities and Engineering Colleges through faculty chairs, matching grants and focused joint projects.

v.   **Internet:** The Internet is likely to continue to revolutionize the way people communicate and access information. The basic principles adopted for the Internet growth in the country would be to encourage competition, avoidance of un-necessary regulations, provision of low cost, reliable and broadband Internet access, Universal Internet Access in the areas connected with the telecom network, free Internet access for public sector Universities and support for the development of national Internet content.

vi.   **Incentives:** The government will invest in various fiscal and non-fiscal incentives to nurture, develop, and promote the use of IT in organizations, to increase their efficiency and productivity. The strategies focus on promotion of venture capital industry through incentives, recognition of software development as a priority industry for financing by the banks and DFIs, creation of investment friendly environment, building investors' confidence and changes in rules to allow the technology companies to be listed on stock exchanges of Pakistan.

vii.   **IT Promotion & Awareness:** A massive IT promotion and awareness campaign would be undertaken. The national strategy includes provision of continued support and funds by the Export Promotion Bureau (EPB) for the participation in world IT/computer trade fairs, exchange of delegations, posting of IT specialists in Embassies and Commercial Consulates, promotion of IT use by the Head of the Government, Ministers, and all other key figures who can influence public opinion at all public and private forums, declaration of the next fiscal year as 'IT Year' and organization of special events during the current year including national and international Exhibitions.

viii.   **IT Usage:** To embark on an aggressive program to improve efficiency and provide quality services to the citizens of Pakistan, IT would be inducted at all levels of government. Key projects thus launched would include Government Online, Electronic Governance Project and E-Commerce Network.

ix.   **Legislation:** To provide protection and enhance the confidence of users, providers, and facilitators of information services, legislation based on the recommendations of the Working Group comprising IT and legal experts would be framed. Action in the areas of

Digital Signature Act, Intellectual Property & Copyright Act and the Consumer Protection Act, has been started. The government should seek legislative approval of changes to statutes that will encourage electronic commerce and revise statutes that mandate a paper-based or manual process.

x.   **Regulations:** A regulatory framework is essential to avoid violating policy goals and direction. It would be ensured that excessive regulations do not stifle industry investment and growth. In devising a useful regulatory framework, the focus would be on creating a fair, equitable and competitive environment, based on the principles of free market and open access.

The IT Action Plan is an integral part of the IT Policy. The Action Plan provides a framework for implementation of the IT Policy which includes priority areas, specific projects that can be conceptualised, formulated, assessed, prioritised and implemented. The implementation of Action Plan is very much dependent on the funding provision for the IT & TC Division and the mechanism from project approval to funds release so that projects could be implemented in a timely fashion to achieve the desirable results in shortest span of time. A separate mechanism for expeditious project appraisal by Experts' Committees, approval and funding under National Scientific and Technological Research and Development Management Fund has been developed and would be submitted separately to the Cabinet for approval.

The main allocation of funds has been foreseen for training, re-training, Human Resource development and provisioning of enabling infrastructure. There are a host of other incentives, which could be done at low or no cost, which include changes in governmental processes, legislation, administrative elements, incentives and rules. Some of these have already been submitted to the relevant quarters for approval whereas others are in pipeline. A system of monitoring, surveying and compiling statistics on the extent and growth of the IT sector will also be devised to provide reliable data for planning and evaluation purposes and to set up performance indicators. The IT Action Plan will be implemented according to its well-defined phased targets and objectives. To ensure that the plan meets its objectives consistently and that suitable midcourse corrections can be incorporated in a timely manner, a mechanism will be set up involving the government, private sector, academia and other national representatives to coordinate and implement the policy and plan elements and provide strategic oversight over the longer term. The IT Policy and Action Plan being a dynamic document, would be subjected to formal review under this mechanism every six months, with more area-specific monitoring carried out on a monthly basis.

2   Preamble

2.1   The wealth of a nation is not judged by its physical assets. It is determined by the technological gaps between the 'haves' and the 'have-nots'. No leap-frogging of the type witnessed in South East Asia is possible without increasing technological sophistication being built into the production structure. Information Technology today drives the technological and economic advancement of the developed as well as emerging economies. The Government is fully aware of IT being the driving force in the new millennium. A number of initiatives have accordingly been taken in the recent past to provide a sharper and clearer focus to the IT sector.

This document is the culmination of intense effort of over 250 people who participated in the effort to make this a workable document in a very short time. This document draws upon the considerable effort of the NDO (now NADRA) in putting together the first draft almost a year ago. Enhancements and inputs followed up this original effort by the Computer Society of Pakistan and the National Telecommunication Corporation.

Very important support and inputs came from expatriate Pakistanis who have formed volunteer support groups from all over the world. Ongoing support form the Strategic Advisory Board, USA and other Advisory Boards in the UK, Middle and the Far East are providing valuable key inputs in to the implementation of the Policy items.

2.2   At the meeting of over 100 Information Technology Professionals and service providers held in Islamabad on 1st April, 2000, under the auspices of IT Commission, it was decided to setup eleven working groups to study and give proposals on specific areas related to I.T. and its development, promotion and application in Pakistan.

2.3   It was decided that the guiding theme for the Policy would be that the Government has to be the facilitator and an enabler to let the Private sector drive the development in IT and Telecommunications. This one single element has galvanized the Pakistan community as a whole to participate wholeheartedly in the process.

2.4   Eleven Working Groups in the respective areas worked on the devising the IT Policy and Action Plan:

- HR Development, Training and Education
- IT in Government and Databases
- IT Market Development and Support
- IT Fiscal Issues
- Telecomm, Convergence and Deregulation
- Cyber Laws, Legislation and IPR
- IT and Telecom Manufacture and R&D
- Internet
- Software Export

- E-Commerce
- Incentivising IT investment

All the Working Groups were headed by the relevant IT experts of national repute - only 2 Group Leaders were from the Governmental Organizations and the rest all were from the private sector. The vision of the Policy is to harness the potential of Information Technology as a key contributor to development of Pakistan and the broad-based involvement of the key stakeholders is a must for its sustainable development.

2.5   The working groups continued their deliberation through interaction with a large number of professionals, IT users and other stakeholders both within and outside Pakistan and made their presentations in a subsequent meeting on 17th April 2000. Thereafter a drafting committee was setup and was assigned the task of preparing the draft I.T. Policy based on inputs from various groups.

2.6   The first draft of the Policy was put on I.T. Commission's websites in the 1st week of May 2000 and comments were invited through press advertisements. A large number of comments and suggestions were received which were considered by the drafting committee and most of these were incorporated into the draft which has been revised a number of times due to new inputs and responses being received continuously.

2.7   Since the I.T. sector is extremely dynamic and developing, it has been decided that the policy and action plan will be subjected to a process of continuous review and update under a modular mechanism focused on well defined short and long-term objectives. Achievements at each phase of implementation will be marked and future targets accordingly reviewed to ensure that initiative is kept on track.

2.8   While the policy was still being framed and finalized, implementation on several short term Actions had commenced. Issues like bandwidth prices and State Bank of Pakistan regulations for software industry have already been resolved. Similarly, Finance Ordinance 2000 has already provided certain fiscal incentives to IT industry. It is expected that in the coming weeks and months several other actions would also be implemented.

3   The IT Policy

3.1   The Vision

3.1.1   To harness the potential of Information Technology as a key contributor to development of Pakistan.

3.2   The Mission

3.2.1   Rapidly develop the infrastructure in synchrony with the creation of excellently trained individuals and teams. Direct these at transforming our society into a prosperous and dynamic one—one that values and benefits from the creation and free flow of information and knowledge. Encourage and assist the entrepreneurial spirit, and make the fruits of this technology available to every citizen.

3.3   Goals

3.3.1   To realise the vision behind the IT policy, the following goals have been set:

3.3.2   Make the Government a facilitator and an enabler to provide maximum opportunities to the private sector to lead the thrust in development of IT in Pakistan.

3.3.3   Develop an extensive pool of trained IT manpower at all levels to meet local and export requirements.

3.3.4   Provide business incentives for both local and foreign investors to ensure the development of Pakistan's IT sector (including the software, hardware, and service industries) and the use of its products.

3.3.5   Develop an enabling legislative and regulatory framework for IT related issues.

3.3.6   Revitalize, emphasize, and support the country's dormant manufacturing and research and development (R&D) potential.

3.3.7   Establish an efficient and cost-effective infrastructure that provides equitable access to national and international networks and markets.

3.3.8   Set up national databases that are reliable, secure, up-to-date and easily accessible. These would be open databases.

3.3.9   Promote widespread use of IT applications in government organisations and departments for efficiency improvement and transparency in functioning and service provision, and to organise and facilitate access to public information.

3.3.10   Promote extensive use of IT applications in trade, industry, homes, agriculture, education, health, and other sectors with widespread use of Internet.

3.3.11   Encourage and promote the development of quality software that can capture export markets.

3.3.12   Develop a tradition of electronic commerce for both national and international transactions.

3.3.13   Encourage expatriate IT professionals to return to Pakistan and establish software houses or extend assistance to the local industry in the form of assignments from abroad.

3.4   IT Policy Strategies

3.4.1   Human Resource Development

3.4.1.1   A major human resource issue in Pakistan is quality education and training, nurturing, and retention of technically skilled manpower. This problem is more severe in IT where technology changes are rapid and there is a large loss of critical trained manpower due to emigration.

3.4.1.2   Manpower development is imperative for the local IT industry to take root on a large scale in Pakistan, and for the country to achieve and maintain the position of an important player in the international IT market. A large pool of skilled manpower is required for all components of the IT industry, and it has to be geared to meet both local and export needs.

3.4.1.3   Whereas a brief working document has been prepared by the IT Steering committee on Education, HRD and Training, a more comprehensive plan for education and human resource development in IT shall be drawn up to meet the present and future needs of manpower.

3.4.1.4   This following section briefly covers IT education and IT training. IT awareness, a related issue, is addressed separately.

3.4.1.4.1   IT education includes degree programs, while IT training comprises short courses that provide focused hands-on skills in specific IT areas where manpower is needed urgently. Such training could be provided to fresh graduates as well as underemployed youth.

3.4.1.4.2   The object of this Policy is to attract the most able students and develop faculty for IT, in order to ensure quality, quantity, affordability, and market relevance of all IT education and training.

3.4.1.4.3   A comprehensive plan for education and human resource development in IT shall be drawn up to meet the present and future needs of manpower.

3.4.1.4.4   Facilitate and encourage the training and hiring of women in the IT sector to help reduce unemployment and to utilise this largely untapped human resource. Women can be hired and can become effective players in large numbers in all sectors of the software and telecommunications industry.

3.4.1.4.5   Facilitate and encourage the use of IT by special people to make them more productive in the society.

3.4.2 IT Education

3.4.2.1   Education determines, more than anything else, a country's prospects for human development and competitiveness. Fortunately, the information revolution offers some extraordinary opportunities in education. The following measures shall be adopted to avail these opportunities:

3.4.2.2   The education sector is responsible for delivering a work force skilled in the use of information systems and a technical corps able to produce and maintain information products and services would be created through appropriate policies and incentives.

3.4.2.3   Make participation by rural and poor segments of society in IT education a strategic priority for both social and economic development.

3.4.2.4   Launch a scheme for providing low-priced computers and Internet connectivity to universities, colleges and schools through a public-private sector initiative.

3.4.2.5   Network all universities, engineering and medical colleges, and institutions of higher learning in the country for improved quality of education.

3.4.2.6   Set up electronic libraries to ensure economical and equitable access to world information.

3.4.2.7   Encourage educational facilities to computerize their registration, examinations, accounting, and other activities.

3.4.2.8   Encourage educational facilities to adopt computer assisted learning and other IT tools to aid in the teaching process.

3.4.2.9   Establish virtual classroom education programs, using online, Internet and/or video facilities, to provide distance learning to a large number of individuals.

3.4.2.10   The Private sector and the Government shall jointly make efforts to meet the growing IT education needs. Specific policy recommendations are:

3.4.2.10.1   Include a compulsory, modern and upto date Computer Literacy module in the matriculation curriculum for high schools. Revise the computer science curriculum at Intermediate level to make it modern and up-to-date and to offer it at all science colleges. Make training in the use of IT applications compulsory for all degree courses within the next 3 years.

3.4.2.10.2   Develop world-class Bachelors, Masters, and Ph.D. programs in Computer Science (CS) and related areas of IT. Develop standardised curricula and teaching materials in co-operation with public and private educational institutions, using international benchmarks for reference.

3.4.2.10.3   To address the critical shortage of qualified IT faculty, hire faculty from abroad under a crash programme, establish Faculty Chairs by attracting foreign and expatriate faculty and arrange faculty development programs.

3.4.2.10.4   Establish a national educational Intranet (linked to the Internet) to enable sharing, among educational institutions, of electronic libraries of teaching and research materials and faculty.

3.4.2.10.5   Attract the best students by establishing scholarship funds and Qarz-e-Hasna for IT education and training.

3.4.2.10.6   Establish Accreditation Council to ensure quality IT education and training. The Council will be responsible for collecting data on educational institutions, rating the institutions, and disseminating information about the institutions. The Council will also establish curricula, testing guidelines and services for IT education and training. The council will consist of leading academics and IT experts and will be linked to provincial IT Boards.

3.4.2.10.7   Establish an HRD fund (HRDF) by the IT Division. This fund will be utilised to expand and improve the quality of IT education, strengthen existing IT educational institutions, upgrade IT infrastructure (including laboratories, connectivity, and teaching resources), develop faculty, attract visiting faculty of international repute, provide student scholarships, share pooled resources through distance learning programs, and develop linkages with foreign universities and global IT firms. Apart from the government, financing through expatriate Pakistani community, international agencies and global IT firms would be mobilized.

3.4.2.10.8   Assign provincial IT Boards the task of working closely with IT Division to ensure quality IT education, strengthen IT educational institutions, develop databases, and establish linkages with industry for jobs and internships.

3.4.2.10.9   Allow administrative and financial autonomy to IT departments in public universities and colleges to enable them to attract and retain qualified faculty and respond quickly to changing requirements of the IT industry.

3.4.2.10.10   Promote the setting up of IT universities and institutes of international standards. Encourage and catalyze collaboration between the government and the private sector, and elicit the assistance of various foundations, multinational companies, foreign universities, and other social and welfare organizations. Strengthen existing institutions to establish a number of centers of excellence.

3.4.2.10.11   Provide foreign and local universities incentives to set up distance learning or resident programs in Pakistan.

3.4.2.10.12   Ensure that existing UGC and University rules and procedures regarding affiliation of private IT institution are clearly defined and transparent in order to expedite the affiliation process and setting up of quality institutes.

3.4.2.10.13   Work Visas for foreign IT faculty shall be simplified and expedited.

3.4.3   IT Training

3.4.3.1   Investments in IT training are expected to yield quick results. Policy recommendations include:

3.4.3.1.1   Ensure high-quality training by assigning the Accreditation Council for IT Education the task of collecting data on training institutions, rating the institutions, and disseminating information on the institutions.

3.4.3.1.2   Take steps to strengthen existing IT training institutions and encourage the setting up of new IT training institutes, update curricula, introduce new technologies through linkages with global IT firms, develop strong local faculties, and provide student scholarships. Organize teacher training on a top-priority basis to meet the growing demand for qualified teachers in IT and for upgrading their skills regularly. To rapidly increase the annual production of IT manpower, launch crash-training programs. Use the HRDF to support IT training activities.

3.4.3.1.3   The IT industry would provide a certain number of internships to fresh IT graduates each year.

3.4.3.1.4   To ensure maximum utilization of existing facilities, encourage public universities and colleges to collaborate with the private sector in conducting training programs during vacations and at other times when the facilities are not in use.

3.4.3.1.5   Introduce mandatory IT literacy courses for all levels of civil and military personnel. Make IT literacy a prerequisite for induction into Gazetted positions.

3.4.3.1.6   Make a special effort to train and induct women in the IT sector.

3.4.3.1.7   Make extra efforts to educate and train people with special needs in order to give them equal opportunity in the society.

3.4.5   Infrastructure Development

3.4.5.1   In order to grow, the local IT industry will need a suitable support infrastructure, i.e., telecommunications and information data banks. Development of the telecommunications sector will entail deregulation, liberalization, privatization, and the creation of a competitive market.

3.4.5.2   Establish IT parks and incubators, equipped with the most modern facilities and matchless incentives, to provide a one-stop shop for prospective investors in the IT industry.

3.4.5.3   The recommendations presented below will facilitate establishment of such an infrastructure.

3.4.5.4   Telecommunications

3.4.5.4.1   A Telecom Policy has already been notified and defines the broad objectives of the Government for the telecom sector.

3.4.5.4.2   A close relationship between the government and the private sector is critical for the development of the telecommunications sector. The following telecom policy strategies are based on government-private sector synergy: the two sectors will need to work together to create a modern, sophisticated, efficient, and productive telecommunications sector that provides services to every segment of society at a reasonable cost.

3.4.5.4.3   The Telecom industry shall be progressively deregulated to be able to provide affordable, competitively priced telecom services, Internet connectivity for a larger community of users. Provisioning of bandwidth for education and software needs, will be further incentivised.

3.4.5.4.4   Increase telephone line penetration rate by expanding the existing telecommunications network and providing new ones employing modern technologies in order to minimize the capital cost of expansion. The government will encourage private sector operators for supply of basic infrastructure and services.

3.4.5.4.5   Barriers to the induction of new technologies (e.g. Wireless Local Loop -WLL) by the Private Sector will be removed to ensure the spread of communications to under-served and un-served areas of Pakistan. Using International technologies, standards and agreements as a basis, progressively open up the 3, 4, 5 and 20-40 GHz bands for growth of the WLL for Internet, Cable and voice communications.

3.4.5.4.6   Develop an integrated, flexible, robust, and reliable transmission network that covers the entire nation and is capable of voice, video, and data transmittal.

3.4.5.4.7   Rationalise PTCL rates and tariffs for all telecommunications services so that they are in line with the costs of providing the services. Establish the tariff for IT industry at par with or below the charges prevalent in the regional and international markets to remain competitive. Regulation of tariff will be done according to the notified telecommunication sector policy.

3.4.5.4.8   The bandwidth rates both domestic and international connectivity will be rationalized to encourage the rapid launch of new Internet and software related services as well as new and needed services like distance learning, telemedicine, video conferencing, etc. This will also provide a competitive edge to local companies trying to break into established International markets.

3.4.5.4.9   To ensure Quality of Service, Service Level Agreements be made mandatory by the Pakistan Telecommunication Authority (PTA) between operators and the customers.

3.4.5.4.10   Encourage telecommunication companies and carrier network service providers to develop and upgrade rural telecommunications facilities. Government is fully committed to the universal service obligation principle and a mechanism for provision thereof has been provided in the telecom sector policy.

3.4.5.4.11   Encourage competitiveness in the telecommunications sector. Ensure that gradual move towards full competition is achieved in all telecommunications services and infrastructure provision by 31 December 2002. The necessary regulatory mechanism needed for such a purpose would fall in place very soon.

3.4.5.4.12   Invite private sector participation on attractive commercial terms in joint telecommunications development work of the PTCL. This will ensure that the PTCL is adequately equipped for the post deregulation competition phase.

3.4.5.4.13   Encourage local companies to enter the telecommunication fields that are closely associated with the infrastructure needed for an information rich society.

3.4.5.4.14   Expand connectivity with other countries, using existing and new regional and global satellite and Optical Fibre links.

3.4.5.4.15   Take appropriate actions to expedite the launch of Pakistan's own satellite at the earliest.

3.4.5.5   Technology Parks

3.4.5.5.1   Information Technology Parks (ITPs) are needed to develop both the hardware as well as the software industry. These ITPs would be set up to provide one-window services to domestic and foreign companies that seek to engage in IT business in Pakistan.   The ITPs should provide workspace, utilities, telecom, and other infrastructure facilities of international standard at low costs. Efficiently functioning ITPs will attract local as well as foreign and multinational entrepreneurs.

3.4.5.5.2   Encourage the private sector to set up such parks on BOT/BOO basis and do the same for IT Incubation Centers.

3.4.5.5.3   In order to expedite the setting up of ITPs, the facilities/incentives being offered by Export Processing Zone Authority (EPZA) and other Industrial zones in the country be fully utilised. IT Division will co-ordinate with EPZA in further facilitating interested IT companies for setting up ITPs and IT projects.

3.4.5.5.4   Charge the lower utility and infrastructure rates for bulk consumers to ITP users.

3.4.5.5.5   Expedite ITP projects in Karachi and Lahore and Islamabad.

3.4.5.5.6   Software exporting companies having a minimum export obligation verifiable through the State Bank of Pakistan in locations other than ITPs should be declared as EPUs (Export Processing Units) to avail the incentives equivalent to that of ITPs. IT hardware manufacturing units having a minimum import substitution capability, should be treated similarly.

3.4.5.5.7   The existing software companies shall be provided land on lease at commercial rates to build their campuses.

3.4.6   Databases and Platforms

3.4.6.1   Databases provide quick and easy access to information, which greatly facilitates the work and increases the productivity of businesses and institutions.   Access to national databases is essential for coordinated and informed decision-making and for efficient planning.   National databases are thus an important part of the IT infrastructure.

3.4.6.2   Both the government and the private sector should be encouraged to participate in the development of national databases.   Two pilot sector projects have been identified and will be initiated shortly. The main recommendations for policy for this area are:

3.4.6.3   Encourage and accelerate government-private partnership in establishing comprehensive databases.

3.4.6.4   Ensure open and equitable access to databases. The databases to be used in the Government will be open and shall provide the utmost flexibility to integrate into the existing environment and should ensure that the systems and software caters for future needs.

3.4.6.5   Access to databases shall be based on open Internet standards

3.4.7   Software Industry Development

3.4.7.1   Software development is a high growth industry and forms a major segment of the vast information technology market and will continue to do so in the future. A developed software industry with a focus on exports (in addition to the local market) would mean better employment opportunities, reduced 'brain drain', foreign exchange earnings, improvement in per capita income, and higher standards of living leading to a better quality of life.

3.4.7.2   The policy recommendations presented for this area, therefore, seek to promote local software development for local needs as well as export.

3.4.7.3   Development of Local Software Industry

3.4.7.3.1   A developed local software industry will not only meet Pakistan's own needs, but will also serve as a training ground for capturing export markets. Key policy recommendations for developing the local industry are:

3.4.7.3.2   Initiate Private- Public sector partnership programs with a view to access to the export market. Address the software with high value and maximum demand, e.g., ERP, ERM, CRM, e-business and e-commerce.

3.4.7.3.3   Outsource Government software projects including mass Data entry, Digitization and GIS projects to the Private sector. Preference will be given to local software companies in awarding such projects and track record condition for such companies would be relaxed.

3.4.7.3.4   Devise a phased plan for the private sector to take over a major part of the government's software development needs.

3.4.7.3.5   In order to make this a reality, entry barriers and hurdles for local Software houses to bid for sizeable government IT projects shall be reduced or removed. These shall be in the form of earnest money, bid bonds, holdbacks, etc. These shall be reviewed and all Government departments to be advised of the new Policy. Secondly, a fair rate (software development rate) and equitable progressive payment methodology has to be ensured for sustainable software development and investment in R&D.

3.4.7.3.6   For software work requiring expertise that is not locally available, engage foreign companies only if a local partner is involved to the extent where 15% added value is provided by the local company to ensure the transfer of technology.

3.4.7.4 Urdu and Regional Language Software Development

3.3.7.4.1 Standardize the Urdu code plate will be launched and a concerted plan to encourage the development of open source and licensable Urdu software would be undertaken. This will enable plug-ins for popular office and e-mail packages to be made available. This initiative is expected to drive the development of other Urdu and Regional software packages for word processing and data base applications.

3.3.7.4.2 The government will encourage the use of open source operating systems and low cost or free English language Office software for normal operations.

3.3.7.4.3 The intent of this initiative is to encourage people to develop skills in working and writing core software for applications and developing tools, which will go beyond the development of the local languages. The application programs for translation, speech to text conversion, databases, ASPs for popular packages will need to be written in currently and newly evolving software.

3.4.7.5 Promotion of Software Export

3.4.7.5.1 Rising costs in developed countries have significantly increased software development outsourcing. This has enabled other countries, especially those in Asia, to tap offshore software development business. So far, Pakistan has not been able to secure any significant share of the global software market.

3.4.7.5.2 The following policy actions are recommended to promote software exports, private sector investments, and attract foreign direct investment (FDI):

3.4.7.5.2.1 A Software Development Fund should be established by the Government to support the promotion, expansion, and improvement of the software industry.

3.4.7.5.2.2 In all countries where Pakistan can address this software development potential, following actions will be taken:

3.4.7.5.2.3 Incubator centers run by professionals will be set up, based on the established systems and principles available in the USA. These will provide a point of presence for software companies in Pakistan. This is imperative, since no company in the US (or other projected export market) will give contracts to overseas software houses unless a local contact and follow-up point is available.

3.4.7.5.2.4 Pakistan must make it easy for foreign-based incubators to sponsor and fund Pakistani portfolio companies. The legal, accounting and regulatory structure must support this effort. This will make it easier for high net-worth Pakistani expatriates to invest in Pakistani start-ups. This will also be easier in the short-term to find US limited partners that would invest in an incubator with a US-based general partner and management team

3.4.7.5.2.5 Appoint IT specialists at Pakistani embassies, commercial consulates, and Export Promotion Bureau (EPB) offices. The IT specialists should be responsible for promoting Pakistani IT products. For some large markets, e.g., the USA and EU markets, hire consultants to manage the effort, with the IT specialist doing the co-ordination work. These IT specialists will help find niche markets, provide market intelligence, and develop guidelines regarding target markets.

3.4.7.5.2.6   Encourage software export projects in IT service areas that require minimum time and can be started with currently available skills. These include operational activities for banks and airlines, medical and legal transcription, data entry, data conversion and call centers. Each of the above has potential to show short-term results.

3.4.7.5.2.7   IT Division to hire competent local and foreign consultants in key markets to conduct two types of studies: (a) marketing assets highlighting the competitive advantage of offshore software development in Pakistan. (b) 'How To' guides for business development for Pakistani exporters in those markets. These consultants will work with the Strategic Advisory Groups being set up by expatriate Pakistani IT experts and professionals in Europe, UK, USA and the Far East. In the same token, hire consultants of international repute shall be hired to develop a plan for Pakistan's software industry and make recommendations on how to access the world markets.

3.4.7.5.2.8   Simplify all governmental procedures related to software exports and recording of revenue for exports with the State Bank of Pakistan (SBP).   Review rules, regulations, SROs and modify those that create obstacles for software exporters. Remove restrictions on foreign remittances and flow of funds.

3.4.7.5.2.9   Encourage expatriate IT professionals to return to Pakistan and establish software houses or extend assistance to the local industry in the form of assignments from abroad.

3.4.7.5.2.10   Encourage equity participation of banks in software projects by setting up venture capital funds. Set up venture capital funds at the federal and provincial levels to encourage private local and foreign funds to establish privately managed venture capital funds. The necessary changes in legislation are being carried out by the SECP (Securities and Exchange Commission of Pakistan).

3.4.7.5.2.11   Encourage the setting up of a 'content industry', comprising intellectual property such as encyclopedias, compositions, photographs, and other information of international interest.

3.4.7.5.2.12   Set fix yearly targets for software export and equip PSEB and PASHA to perform its role effectively in export marketing. Earmark adequate funds and provide infrastructure to promote software exports.

3.4.7.5.2.13   Encourage local business to invest in software industry.   Conduct awareness campaigns to highlight the immense potential and high returns from this industry.

3.4.7.5.2.14   Encourage major multinationals operating in Pakistan to set up software facilities and bring international business through their established channels.

3.4.7.5.2.15   PSEB in consultation with PASHA to prepare effective marketing materials using multimedia to highlight Pakistani software expertise, government initiatives, incentives, and necessary statistics. This will enable direct contact with target markets and will create a good image of Pakistan's software industry. Extensive use of the Internet and Web will be made.

3.4.7.5.2.16   Assist entrepreneurs locally and abroad in obtaining visas and work permits. Major diplomatic efforts should be made where required.

3.4.8 Hardware Industry Development

3.4.8.1   In the context of Information Technology, the hardware industry can be defined as "design, development, manufacturing and maintenance of all products, modules and components that form the building blocks of an IT infrastructure". A thriving hardware industry is pivotal to the growth of IT infrastructure and services. Development of this industry will make Pakistan self-reliant, competitive and a net exporter of technology.

3.4.8.2   The policy recommendations for this area do not seek to initiate aggressive competition with developed countries. Rather, they focus on developing the areas that are within Pakistan's reach, in terms of technology and resources, and in which the country could have a comparative advantage. It is recommended that the concessions incorporated in policy for the software industry be extended to the hardware industry. General recommendations for this industry are provided below, divided into two important categories, i.e., manufacturing and R&D. Most of the value of the "hardware" development revolves around software development. However, the hardware needs to be in place for this to happen. The focus will be on niche markets with a large value added content. Products that are of a high volume, rapidly changing variety (for example PCs) will not be encouraged.

3.4.8.3   The concessions incorporated in policy for the software industry shall be also extended to the hardware industry.

3.4.8.4   The EPB initiatives for ISO 9000/1 implementation will be effectively deployed in these industries.

3.4.8.5 Manufacturing

3.4.8.5.1   Establish a Hardware Development Fund (HDF) to finance IT hardware related R&D and manufacturing activities. IT Division would supervise the HDF's operation.

3.4.8.5.2   The duties will be brought in line with the tariff structure in regional countries which are competing with our local industry.

3.4.8.5.3   For procurement of IT hardware (of a contract value above a certain limit) from international sources, the customer in the public/private sector shall ensure local value addition.

3.4.8.5.4   Encourage and reward enhancements in the depth of production achieved by local manufacturers which result in increased local value addition and competitiveness.

3.4.8.5.4   Transfer management control of existing manufacturing concerns in the public sector to the private sector through equity participation or long-term lease.

3.4.8.5.6   In order to accelerate the pace of business, IT manufacturers shall be offered the facility of having their premises declared as document-based bonded units enabling them to have un-hindered and tax-free access to materials/services and global infrastructure for the industry.

3.4.8.5.7   A consistent duty/tax/regulatory structure shall be ensured to enable local and foreign investors to make long-term investments in this industry.

3.4.8.5.8   Provide special incentives that are directed towards reducing the cost of inputs.

3.4.8.5.9   Eliminate the royalty on the manufacture of telecom equipment within the country and simplify the type approval process by the PTA..

3.4.8.6   Technology Transfer and R&D

3.4.8.6.1   Identify key technology areas and provide fiscal support and incentives to encourage local technology development.

3.4.8.6.2   Encourage and fund R&D in universities and engineering colleges. Make it attractive for industries to set up R&D centers at university level through matching grants and focused joint projects.

3.4.8.6.3   Encourage expatriate IT experts and educationists to spend their annual vacations in Pakistan to transfer their knowledge and share their experiences with local universities. Fund such visits using the HDF.

3.4.8.6.4   Setup an Information Resource Center with on-line linkages to reputed scientific information repositories, accessible from all major cities of Pakistan

3.4.8.6.5   Initiate "Innovative Ideas" competitions on countrywide basis, covering all levels (from schools to premier R&D Centers), to instill the spirit to innovate in our young professional.

3.4.9   Internet

3.4.9.1   The Internet is likely to continue to revolutionize the way people communicate and access information. Because it represents such a powerful communication tool, the environment in which the Internet operates must be understood and regulated differently from traditional communication media. Three general principles should be adopted if the Internet is to grow in Pakistan: (i) existing regulatory structures should not be forced on it, (ii) competition in Internet growth should be encouraged and (iii) unnecessary regulations should be avoided.

3.4.9.2   To expand provision and use of the Internet in Pakistan, it is necessary to provide low-cost and reliable access to the international bandwidth, reliable local bandwidth connectivity, low-cost access to network equipment, widespread public access to networked computers, a base of educated and trained users and providers and support for the development of national Internet content.

3.4.9.3   The Pakistan Internet Society would be formed to ensure the optimal inductions of Intent and Intranet based services into Pakistan. It will comprise of a Chairperson, an Engineering Chair and a Social Internet Chair.

3.4.9.4   The aspects that need to be considered in this regard are discussed in the following paragraphs.

3.4.9.5   **Internet Market Development**

3.4.9.5.1   Although the Internet industry is not easily classified into tidy segments, three main categories of Internet service providers can be distinguished in Pakistan:

- Backbone Service providers

- Internet access and service providers

- Content providers and other value-added service providers.

3.4.9.5.2   It is important to note that many Internet service providers (ISPs) also fall into one or both of the other two categories.

3.4.9.5.3   To ensure that the Internet market develops:

3.4.9.5.3.1   Create an environment that allows for as much competition as possible. Ideally, this should extend as far as the provision of physical network infrastructure.

3.4.9.5.3.2   Encourage PTCL and new carriers in the private sector to develop into backbone providers. If such telecommunications operators function as Internet access providers and/or content providers, they should do so through a subsidiary company. Moreover, income derived from other services of the carriers should not be used to cross-subsidize their Internet services. The Internet services thus provided by such subsidiary companies should be cost based to enable fair competition. This will ensure transparency and fair competition.

3.4.9.5.3.3   Permit and encourage existing and future ISPs to provide Backbone and Peering services. Encourage them to set up different nation-wide physical delivery and access mechanisms via IP Radio, Fibre, Laser and Microwave.

3.4.9.5.3.4   Make the licensing procedure as simple as possible, low-priced, and free of high royalty structures, as these costs are ultimately passed on to consumers and restrict growth

3.4.9.5.3.5   Establish robust and reliable Network Access and Peering Points both by the PTCL as well as the Private sector in order to locally route in-country traffic on the Internet as well as provide multiple, reliable and zero failure Pakistan Internet homing to NAPs in Europe, USA and the Far East.

3.4.9.6   **IP Delivery Mechanisms**

3.4.9.6.1   The rapid roll-out of new telecommunications infrastructure is critical to the rapid growth of the Internet in Pakistan. It is, therefore, important that any telecommunications framework encourages the development of 'alternative physical delivery mechanisms'. This strategy is expected to effect a major improvement in the penetration of the basic infrastructure and Internet accessibility. Some of the alternative delivery mechanisms that must be explored are:

- **Wireless/Laser Technologies**. Wireless/Laser technologies are a particularly important way of addressing local loop capability because of their rapid roll-out, greater reliability, and lower maintenance cost. To this

end, specific frequency bands will be released for Packet Radio for the higher Spread Spectrum bands (since the 2.4 GHz is already choked) as well as the 20-40 GHz LMDS operations. Wherever Fiber can be deployed, it will be encouraged.

▪ **Electricity Supply Grid**. The use of an electricity grid should be investigated since the penetration of electricity in Pakistan is much greater than telecommunications, especially for rural areas.

▪ **Satellite Operations**. A number of international satellite operators have already begun to provide high-speed Internet access. These services should be encouraged to overcome bandwidth limitations, not only in urban areas but also in the rural and suburban areas, for basic Internet connectivity. Satellite simplex Internet services being broadcast in nature will not require any license or clearance to operate.

▪ **Cable TV**. Convergence of voice, data, and video transmittal has opened up new opportunities for quick access of users and operators. Cable TV is expanding very fast and infrastructure for it is being laid. Regulations are to be put in place to allow cable operators to offer Internet services in collaboration with licensed ISPs. The LMDS and MMDS operations would be permitted after clearance from the FAB.

3.4.10   Fiscal and Financial Incentives

3.4.10.1   The government will need to invest in various fiscal and non-fiscal incentives to nurture, develop, and promote the use of information technology in organizations, to increase their efficiency and productivity. Most of the non-fiscal incentives have been discussed earlier. This section discusses the broad fiscal and some additional non-fiscal incentives required for IT awareness and promotion. These recommendations will become operative after the necessary consents have been obtained from the relevant authorities, e.g., State Bank of Pakistan, CBR, Banks, SECP, Export Promotion Bureau, Ministry of Finance, etc.

3.4.10.2   Declare information technology as 'Infrastructure Facility'. 'IT industry' to be redefined as including Internet Service Providers duly licensed by Pakistan Telecom Authority (PTA), Data Network Operators duly licensed by PTA, Software Houses registered with Pakistan Software Export Board (PSEB), Call Centers registered with PTCL, IT Universities, IT Colleges and Training Institutes, System Integrators, Data Network Designers and Developers, IT/Software Technology Parks, Data Entry Operations and Medical/Legal Transcription Companies, Tele Medicine Centres, Manufacturers of IT equipment, Research and Development organizations/ companies in IT field, Web Designing, Development and Hosting Companies.

3.4.10.3   Extend existing incentives given to specific sectors of the IT Industry to the entire IT Industry; selective application will only encourage corruption, and time consuming procedures will discourage the intended beneficiaries.

3.4.10.4   Remove the anomaly of tax deduction at source for bandwidth purchase by ISPs, PTCL and other telecommunications service providers.

3.4.10.5   The Venture Capital Companies and Fund Management Rules 2000 have been formulated and circulated by the SECP for comments. Venture Capital Funds for low-interest loans and investment in equity for companies set up by enterprising and qualified people in software, hardware design, and human resource development, would now be established. Additionally, give the Venture Capital companies income tax concessions by allowing them to set off losses in one invested company against profits in another company during a particular year, tax breaks, and allowance to redeem all their paid-up capital.

3.4.10.6   To attract US accounting and legal firms to provide familiar transparency to US investors and lower the perceived risk for these investors. Also, create the kind of enterprise-friendly regulatory environment that would attract leading US investment banks to set up local offices with the specific aim of taking successful Pakistani start-ups public in the US and other stock markets. This will provide the liquidity potential without which venture capital firms will not invest.

3.4.10.7   Encourage investments in all phases of IT businesses, like idea generation, start-up, growth ramp-up, and exit process.

3.4.10.8   Create a foreign investment friendly environment, especially to fund large infrastructure investments which, will most likely not return the investors' capital in the short-term. A clear example of such an investment area might be carrier infrastructure. The only realistic way to fund this infrastructure is through existing large global carriers. These carriers will invest only if (a) they anticipate stability in the regulatory and economic environment, (b) they can license key assets through long-term contracts (e.g., rights-of-way, spectrum, etc.) and (c) they expect strong growth in bandwidth demand in the future.

3.4.10.9   Allow the nationalized banks, other banks, and investment funds to create an underwriting fund so that the public offer of IT companies can arrange for a portion of their capital to be underwritten.

3.4.10.10   Encourage public sector non-banking and investment financial institutions, such as NIT, to put up at least 20 percent of the public offers of telecommunications, software, and other IT related companies.

3.4.10.11   Frame special listing procedures through the Securities and Exchange Commission of Pakistan (SECP) to attract IT companies to be listed on stock exchanges of Pakistan. The procedures may include removing minimum public offer percentage, profit track record and age of company. Frame special guidelines for the establishment of Over the Counter (OTC) exchanges at the stock exchange to help list small capital companies with high volatility.

3.4.10.12   Assist and give incentives to private companies for acquiring ISO/SEI and other certification for quality standards for the IT industry (e.g., subsidize 50% cost of such activities).

3.4.10.13   Give commercial and investment banks special tax concessions on earnings from investments in IT ventures. Establish a special pool of debt for IT companies.

3.4.10.14   Give special incentives to foreign universities and companies for setting up development and educational centers in Pakistan by venture capital funding.

3.4.10.15   Enhance the limits for export refinance facility for software exports based on previous years' performance, to help finance established software companies.

3.4.10.16   For duty and tariff purposes of the IT industry, treat IT hardware, software, and related equipment (e.g., radio modems, routers, electronic components test equipment and consumables) as one category and exempt them from all duties, taxes and surcharges.

3.4.10.17   Make the re-import and re-export of IT equipment requiring repairs, or re-import of recorded or packaged software easy and transparent, simplifying documentation procedures.

3.4.10.18   Ensure that all equipment/software tools being imported for IT exports are swiftly cleared and CBR to clear such cases on priority basis.

3.4.10.19   To retain qualified faculty within the country, IT faculty at universities and institutions shall be exempted from Income Tax.

3.4.10.20   Allow local businesses to treat expenditure on software and hardware as tax deductible, e.g. leasing is treated currently as a tax-deductible expense for purposes of corporate income tax calculation.

3.4.10.21   Allow 100% depreciation for hardware, software, and other equipment in the first year of its use in the IT industry.

3.4.11   IT Promotion & Awareness

3.4.11.1   A massive IT promotion and awareness campaign should be undertaken. A national strategy should be worked out and the structure for its implementation put in place. This will include:

3.4.11.1.1   Provision of continued support and funds by EPB for the participation in world IT/computer trade fairs, which is vital for the IT industry.

3.4.11.1.2   Extensive usage of the electronic media to aid in the awareness drive. The drive would be aimed at enabling the citizens to utilise available data on official networks.

3.4.11.1.3   Promotion of IT use by the Head of the Government, Ministers, and all other key figures who can influence public opinion at all public and private forums. Ministers of concerned ministries can be made to ensure that the departments under their control automate their work on a priority basis.

3.4.11.1.4   Declaration of the next fiscal year as 'IT Year'.

3.4.11.1.5   Organization of special events during this year, such as National IT Conference and Computer Exhibitions in major cities, mobile computer exhibitions, international conferences and exhibitions, IT competitions at various levels, and special programs on electronic media.

3.4.12   IT Usage

3.4.12.1   IT in Government

3.4.12.1.1   To embark on an aggressive program to improve efficiency and provide quality services to the citizens of Pakistan, information technology must be inducted at all levels of government. This induction and its effective utilization will also help in motivating others to follow suit, since the government has a large bearing on all segments of the society.

3.4.12.1.2   The e-government model for Pakistan is a gigantic task. It may take 5-7 years because of financial constraints as well as inadequate professional know-how to undertake system re-engineering of different government departments and use of I.T. so that use of paper is minimized. Therefore, a modular approach will be adopted to achieve the goal of e-government.

3.4.12.1.3   In the government sector, knowledge of IT is limited. The different departments and agencies are, therefore, technically at a disadvantageous position to take sound decisions in acquiring IT hardware, software applications, HR development program and operational support for their system. Therefore, the government agencies will be requested to consult IT & TC Division in matters relating to IT.

3.4.12.1.4   The main features of e-government would include the following:

3.4.12.1.4.1   On the pattern of the IT Division, each provincial government shall create an IT Department/Board to plan, co-ordinate, and implement government IT projects. The Departments shall be staffed with IT professionals.   Special pay scales/contracts shall be introduced for IT professionals.

3.4.12.1.4.2   A minimum of 2% of the budget shall be allocated for IT Services and Provincial as well as Federal IT departments will allocate a substantial sum annually for developing IT infrastructure and conducting training at all levels in the government.

3.4.12.1.4.3   Working Groups shall be formed to create awareness in all Government organizations about the utility of computers and IT. For recommendation of these items, consent of the Establishment Division at the Federal level and S&GAD departments of the Provincial Governments will be obtained.

3.4.12.1.4.4   IT literacy shall be made mandatory for all future government employment, and a column shall be introduced in the ACR form for assessment of IT knowledge and utilization by government employees.

3.4.12.1.4.5   The Internet and Intranet e-mail shall be utilised for inter-office communication (necessary security, digital authentication and legal cover shall be provided to secure the validity of such communications) and the establishment should replace physical file system to computer base file system.

3.4.12.1.4.5   The IT departments shall pre-qualify private firms to provide IT consultancy services, software development and products to the government.   Computer and office automation training for all management and secretarial staff shall be taken up

on a priority basis. Selection of networking operators for government projects will be done on a competitive basis.

3.4.12.1.4.6   National databases of economic activities shall be prepared to provide facts for different policies framed by the government. These databases shall be made accessible to the public through the Internet, in accordance with the Laws of Pakistan. This will lead to transparency in Government transactions and various bidding processes.

3.4.12.1.4.7   Representation from the private sector and the provincial governments shall continue in the IT Commission for generating new concepts, solving IT related problems, and ensuring due participation of all stakeholders in ongoing as well as future efforts towards IT implementation. The IT Commission will provide inputs on a continuous basis. The existing composition of the IT Commission shall be expanded and the groups formed for formulation of the IT Policy shall continue to work as associate members of the IT Commission.

3.4.12.2   IT in the Economy: E-Commerce

3.4.12.2.1   Revolutionary advances in information technology have facilitated economic and social changes that are transforming business and society. A new kind of economy called the 'information economy' is emerging. In the current jargon, this is known as e-Commerce.

3.4.12.2.2   In the new economy, information is a critical resource and the basis for competition. Old ways of doing business are being attacked and sometimes defeated. At the social level, a corresponding change has set in. Society's information capabilities are pervasive, making it substantially different from an industrial society. It is much more competitive, more democratic, less centralized, less stable, more capable of addressing individual needs, and friendlier to the environment.

3.4.12.2.3   These changes dictate a major agenda of structural adjustment. Advanced countries are aggressively pursuing their version of the agenda, and developing countries like Pakistan must follow suit or risk falling further behind. The information adjustment required must achieve macroeconomic and political balance while the economy struggles with uncontrolled information flows and global competition, trade, and investment.

3.4.12.2.4   Broad policy recommendations for the sector are:

3.4.12.2.4.1   Effect systemic improvements in the functioning and competitiveness of key sectors of the economy through strategic information policies and systems. Typical among the strategic systems are sector-wide information systems for education, health, public sector management and transportation, electronic payments, university and science networks, trade facilitation, property and business registries, disaster prevention and management, and national statistics.

3.4.12.2.4.2   Develop new ways to use information technology to help solve the most pressing problems of human and economic development—education, health, poverty alleviation, rural development, and care for the environment.

3.4.12.2.4.3   Where the private sector can provide investment and services, the government acts as a catalyst for the formation of markets. In information projects, where market failures are more frequent, provide government financing and incentives. When the private sector requires initial assistance to adjust to a highly competitive information economy, provide assistance and incentives to empower private firms, which comprise the main engine for growth.

3.4.12.2.4.4   The private sector is pre-eminent in deployment of the information infrastructure through the provision of goods and services on a competitive basis. Allow the private sector to satisfy market demands and, occasionally, give it an initial boost.

3.4.12.2.4.5   Communities and non-governmental organizations often have the best local connections for efficient and appropriate development efforts. Encourage alliances that work through these agents.

3.4.12.2.4.6   To provide safeguards for the privacy of individuals and the confidentiality of transactions against all possible misuse, including that by the State, within the legal framework.

3.4.12.2.4.7   Greater role of SMEs in exports through e-commerce by providing low cost accessibility to markets and services which were not available before.

3.4.12.2.4.8   Simplify citizens' access to government while providing choices and options for interaction with government. IT is now being used effectively in Land Management, Water Management, Yield Assessment, Livestock management etc. Pakistan being a predominantly agricultural country, shall explore avenues for using IT for increasing efficiencies in agricultural sector. A high-powered Working Group would be formed to recommend use of IT in Agriculture. The working group shall also explore the possibility of inducting "Basic IT Officers" (BIT) to help the farmers in the use of IT.

3.4.12.2.4.9   Establish Electronic Commerce Wing in the IT Division to govern all the electronic commerce affairs in Pakistan.

3.4.12.2.4.10   Plan and implement different aspects of electronic commerce, such as awareness, promotion, education and training; EC infrastructure implementation; EDI; the Internet and other emerging technologies for EC services; and laws, regulations, and standards for EC.

3.4.12.2.4.11   To encourage computerization all registered organizations shall be given tax incentives for computerization.

3.4.12.2.4.12   All trade transaction like L/C, bills of lading, etc. shall be encouraged to be made through electronic means.

3.4.12.2.4.13   As a tool to enforce transparency and ensure documentation in the economy all business transactions such as import/export activities shall be given a timetable to use electronic means.

3.4.12.2.4.14   Manufacturers and suppliers shall be encouraged to show bar codes on every item sold in the country.

3.4.12.2.4.15   Facilitate international trade through an e-commerce infrastructure

3.4.13   Legislation and Regulations

3.4.13.1   Legislation

3.4.13.1.1   To provide protection and enhance confidence of users, providers, and facilitators of information services, legislation based on the recommendations of the steering group comprising IT and legal experts would be framed. The UNCITRAL model laws should be kept in mind while drafting laws.

3.4.13.1.2   Actions in the following areas should be considered on a priority basis:

3.4.13.1.2.1   Digital Signature Act - Laws should be enacted and/or amended to recognize digital IDs, signature certificates, and electronic authentication and verification.

3.4.13.1.2.2   Computer Crimes Act

3.4.13.1.2.3   Tele-Medicine Development Act - This should cover the legal issues involved in professional services provided electronically by practitioners in another country. Adequate provision should be made for covering liabilities associated with directly accessed information and services such as medical information or advice.

3.4.13.1.2.4   Intellectual Property/Copyright Act and the Consumer Protection Act - The copy right laws should be strictly enforced to protect intellectual property rights of software developers and IT service providers while at the same time protecting the rights of the consumers

3.4.13.1.2.5   Admissibility of copies of electronic records in an administrative or court proceeding.

3.4.13.1.2.6   Review of existing laws to remove any contradictions that may hinder the implementation of IT Policy.

3.4.13.1.2.7   The government should seek legislative approval of changes to statutes that will encourage electronic commerce, and revise statutes that mandate a paper-based or manual process.

3.4.13.2   Regulations

3.4.13.2.1   A regulatory framework is essential to avoid violating policy goals and direction, incorporate social and consumer concerns in the deployment of new products and services, and safeguard precious national resources. It shall be ensured that excessive regulations do not stifle industry investment and growth.

3.4.13.2.2   In devising a useful regulatory framework, the following measures shall be taken:

3.4.13.2.2.1   Focus on creating a fair and competitive environment, based on the principles of free market and open access.

3.4.13.2.2.2   Give network operators the freedom to build their own backbone and local access. Encourage combined and collaborative efforts in this regard.

3.4.13.2.2.3   Facilitate rapid deployment of infrastructure for promotion of IT services.

3.4.13.2.2.4   Review government management and procurement policies to encourage competition among telecommunication services providers in technical service standards, prices, and development of broadband services.

3.4.13.2.2.5   Through the PTA, ensure that the Authorized Service Providers meet network standards.

3.4.13.2.2.6   To enable a free society to function, minimum amount of intrusion will be permitted in terms of Monitoring and filtering on all kinds of communication.

3.4.14   Standards

3.4.14.1   The government should consider standards on an ongoing basis as part of a continuing IT planning process. To determine where to standardize, the process should consider costs and benefits. Benefits may include:

- Easier sharing of data

- Easier sharing of skills

- Economic usage of resources and

- Improved product quality.

3.4.14.2   The relevant steering group will study, review, and recommend standards to be adopted in the use of IT by the government and the private sector.

3.4.14.3   The government shall carefully consider the costs and benefits of standardization in technologies where there are many reasonable standardization alternatives and/or no clearly dominant standard exists. These considerations shall be settled through an open, visible process with broad participation from relevant government representatives and public and private sector organizations.

3.4.14.4   Standards should be published on a regular basis. The publications can be used as guidelines by government, and public and private sector organizations throughout the country. Where specific standards are identified as critical to the development and deployment of a countrywide infrastructure, compliance with these should be made mandatory.

3.4.14.5   Apart from participation in international standardization activities, the government shall recommend standards and guidelines for the following:

- Two-way electronic business transactions

- Countrywide electronic mail exchange

- Non-refutable electronic signatures

- Classification of information

- Videoconferencing systems, and

- Minimum encryption standards for data requiring various levels of security

IT ACTION PLAN

4.1	**Action Plan for Year 2000-2001**

4.1.1   The IT Action Plan is an integral part of the IT Policy. The Action Plan provides a framework for implementation of the IT Policy which includes priority areas, specific projects that can be conceptualised, formulated, assessed, prioritised and implemented. The implementation of Action Plan is very much dependent on the funding provision for the IT & TC Division and the mechanism from project approval to funds release so that projects could be implemented in a timely fashion to achieve the desirable results in shortest span of time.

4.2	**Establishment of IT & Telecommunications Division**

4.2.1   One of the reasons for inadequate progress in IT field has been the existence of too many IT departments and agencies created by government without an apex body having coordinating and controlling powers. The creation of IT and Telecom Division has solved this problem. This division will be the only governmental agency which will guide IT industry and perform regulatory functions. It is, therefore, essential that a full-fledged IT Division becomes operational as soon as possible. In view of special nature of constantly changing IT discipline, the Division will have Civil Servants as well as IT professionals who will be hired at market salaries to head different wings of IT & Telecom Division. The core wings of the Division would include Human Resource Development, IT Development, Telecommunications and Legislation.

4.2.2   The above-mentioned Wings will also cover the subjects including technology parks, national databases, national and provincial awareness, promotion of IT in trade, industry, agriculture, education, health and other services, IT in government, special Projects, standards, funding, incentives, collaboration, regulation and deregulation.

4.3	**National Scientific and Technological Research and Development Management Fund**

4.3.1   Science and Technology including IT has so far not been given the due national priority and allowed to play pivotal role as an agent of change. A number of factors have contributed to this rather dismal situation. Major reasons for the pitiable sate of S&T in Pakistan has been lack of budgetary priority and poor implementation of earlier plans and programmes.

4.3.2   In the second meeting of National Commission for Science & Technology held on 2 May 2000 under the chairmanship of Chief Executive of Pakistan, it was agreed in principle that Rs. 15.7 billion would be contributed to the National Scientific and Technological Research and Development (STR&D) Fund during the fiscal year 2000-2001 to implement the programmes approved by the NCST. The Chief Executive Secretariat had earlier approved the establishment of a National STR&D Fund through which all R&D projects emanating from the Universities and R&D institutions are to be funded. The focal point for control and coordination of the fund related activities would be the Ministry of Science & Technology.

4.3.3   The present mechanism for funding S&T projects has been an important factor in delayed implementation. The antiquated procedures involved in the project approval need to be drastically changed in order to make it easier and quicker to obtain approval and funding for science projects from the Government and thereafter utilise and effectively absorb allocated funds. The accepted international norms for science funding invariably involve review by a Scientific Committee of experts in the

relevant field which approves projects, releases funds and thereafter monitors projects for implementation. The present system of project approval for S&T projects involves preparation of projects on standard PC-I proforma which is then processed through a hierarchy of different governmental forums. This mechanism consumes a lot of time and energy, contributes to delayed approvals and generally discourages the scientific community from preparation and processing of projects. Further, Government bureaucratic structure is not adequately equipped to evaluate projects of scientific and technological nature.

4.3.4   Under the proposed mechanism, scrutiny of S&T projects through a National Committee of Experts and subsequent approval by the National Science Board comprising of eminent scientists, technologists and representatives of other relevant Ministries, particularly the Ministry of Finance and Planning Division would be carried out. The procedure does not aim at either avoidance of documentation or financial discipline. The fund envisages the approval of all R&D projects of a value less than Rs. 100.00 million by the S&T Board headed by the Minister for Science & Technology while the projects above Rs. 100.00 million be approved by the National Science Board chaired by the Minister for Finance. Formulation of STR&D Fund is currently under submission to the Cabinet for approval.

4.4   **Project Plan**

4.4.1   Government has committed Rs. 5.0 billion for the IT & Telecommunications Sector in the Public Sector Development Programme of year 2000-2001. Out of these, Rs. 2.0 billion have already been allocated as Block Allocation whereas Finance Division has committed to provide remaining 3.0 billion during the course of remaining part of the year by re-appropriation of funds. The present system of project formulation and approval would be adopted till STR&D Fund is established.

4.5   **Human Resource Development**

4.5.1   The main allocation of funds has been foreseen for training, re-training, Human Resource development and provisioning of enabling infrastructure. The following major projects would be launched under the HRD Programme:

4.5.2   **Training of Blue Collar IT Workers**

4.5.2.1   Under this short term programme, training of thousands of data entry operators in simple data entry operations and medical and legal transcription would be started across the country. Government would subsidize the cost of training in the public and private sector institutions by 75% of the course cost which would be carried out in existing public and private sector training institutions.

4.5.3   **Establishment of National Accreditation Council and Testing Service**

4.5.3.1   The Council will be responsible for collecting data on educational institutions, rating the institutions and disseminating information on the institutions. The council will also establish curricula and testing guidelines for IT education and training. The council will consist of leading academics and IT experts and will be linked to provincial IT Boards through representation on the boards. A National IT Testing Service would also be managed by the Accreditation Council which would continuously monitor the performance of IT education and training by collecting data and placing these on websites. Standardized curricula following international standards would be rapidly developed for all levels of IT education and training including Masters, Bachelors, Diploma, Intermediate, and Certificate (short

courses). The NAC would also undertake Nation-wide test for scholarships and admissions and selected exit tests (by module) and professional certification. A standard curriculum could be recommended to all institutions having the Charter to offer Bachelors degrees. Provincial IT Boards will work closely with the Accreditation Council and Institutional Development Cell to ensure quality of IT education, strengthen IT educational institutions, develop databases, and establish linkages with industry for jobs and internships.

4.5.4	**Scholarships and Qarz-e-Hasna Scheme**

4.5.4.1	The high cost of BCS education (Rs. 50,000 plus per year in private institutions) prevents many able students to enter the IT profession. National scholarship fund and Qarz-e-Hasna schemes for BS and MS students at accredited institutions would be established to support such students. Scholarships would be given based on a nation-wide test (which could also gradually become a standard component of entry testing). First 500 students would be offered scholarships whereas second batch of 500 students on the national merit list would be offered Qarz-e-Hasna.

4.5.6	**Internet for Education**

4.5.6.1	Free leased line Internet access to the public sector Universities would be provided under an agreement with the private sector Internet Service Providers and PTCL. Bandwidth would be provided by the ISPs and PTCL would provide local lead connectivity through digital cross connect network. PTCL would also offer the reduced rates for connectivity to the educational institutions.

4.5.6.2	A wide-band Intranet, Pakistan Educational Intranet (PEI), connecting all educational institutions (public and private) would be established with centralized data warehouse containing teaching and research material in order that resources may be shared (through video-conferencing and distance learning).

4.5.7	**Faculty Training**

4.5.7.1	Short refresher courses (5-10 days) in each of the core areas of the BS-CS and BS-CE curriculum would be arranged. A pool of experts (PhDs from academia and industry, both in Pakistan and abroad) would be invited (for short periods) to act as master trainers. Teacher training to develop teachers for short courses and PGD program would be arranged to retrain existing science teachers and fresh graduates. The IT professionals will be imparted training in teaching techniques to enable them to undertake teaching assignments on part time basis.

4.5.8	**Establishment of Faculty Chairs**

4.5.8.1	Faculty chairs to attract and retain qualified IT faculty and to encourage faculty to focus in their area of specialization would be established. Each Chair would be expected to conduct research in the area of specialization and present it during an annual conference, supervise Master's (and possibly PhD) thesis students, offer elective courses (in the area), develop teaching material and conduct short faculty refresher courses (for BS-CS faculty) in the area.

4.5.8.2	Public universities will be encouraged to collaborate with the private sector for conducting training programs during vacations and when facilities are not in use.

4.5.9	**Hiring of Faculty from Abroad**

4.5.9.1   In order to meet the critical shortage of faculty, a crash programme would be launched under which faculty from abroad on market salaries would be appointed and deputed in public and private sector accredited Universities. Government would subsidize the cost incurred on account of salaries and travel charges to these faculty members.

4.5.10	**Strengthening and Capacity Building at IT Institutes and Universities**

4.5.10.1   Capacity at 15 institutions (public and private) to offer quality Masters and PhD education in areas including Computer Science (MS-CS), Computer Engineering (MS-CE), and MIS would be built. Each institution would be required to send in detailed proposals, action plans and performance targets. MS and PhD Programs (in the 15 partner institutions) would be immediately started by obtaining the services of international faculty for one or more semesters. The visiting faculty would also be responsible for conducting faculty refresher courses for BS (CS, CE) teachers.

4.5.10.2   One hundred institutions (public and private) would be selected to offer quality Bachelors education in Computer Science (BS-CS) and Computer Engineering (BS-CE). Capacity of 40 universities/colleges to offer a PGD in Computer Science and a PGD in MIS with a focus on Systems Analysis and Software Project management would be strengthened. This program would aim at re-training 2000 under-employed graduates.

4.5.10.3   IT Labs be established at major public and private sector universities, colleges, government training institutes and schools. Capacity at 200 government colleges would be built to offer the Computer Science paper at the Intermediate level (FSc - ISc). Capacity of selected educational institutions to introduce new technologies and provide training in skills needed by the market would be developed. Short courses will need to be developed to cater for data entry and other low-tech jobs.

4.5.11	**Computer Literacy of Government Officers**

4.5.11.1   Many efforts have been made in the field of computer literacy of government officers in grade 17 and above. The results have not been encouraging. In this respect all probationary officers under-going in-house training will be imparted in-depth computer knowledge and practice. At the end of training the Federal Public Service Commission will conduct examination to judge IT proficiency. No officer will be posted unless he passes IT related component of examination.

4.5.12	**Computer Literacy for all University Graduates**

4.5.12.1   IT usage in public as well as private sector is much below the desired scale/level. The younger generation, which will form the core of middle management and top management level in the next decade, has to be familiarized with IT at the graduation level of education. While the students going to IT profession will study the discipline in detail the other graduates (engineers, doctors, lawyers, business managers with commerce/science/arts degrees) should be made so study IT as a compulsory subject of 100 marks so that they become advocates of IT usage when they occupy their official seats after completion of their educational career.   IT   & TC Division will engage consultants to prepare a scheme for implementation, in phases, starting with degree colleges in district towns. The initial planning work will commence in FY 2000-01. The scheme will be launched in 2001-02 at selected places; and it will be replicated every year thereafter.

4.5.13	**Training of Commercial Counselors**

4.5.13.1   "IT sales promotion training" of commercial councilors will be made compulsory before their posting abroad. Secondly, a refresher course for existing commercial councilors may also be arranged in consultation with Ministry of Commerce.

4.6	**Telecommunications, Internet and Infrastructure**

4.6.1	**Universal Internet Access**

4.6.1.1   To spread Internet to remote locations, PTCL will make the UIN (Universal Internet Number) into a local call (from the remote locations) to the nearest PoP of one or more ISPs. This will enable equitable access. In parallel, a drastic reduction in leased line charges will enable ISPs to go to smaller locations.

4.6.2	**IT Parks**

4.6.2.1   IT Parks are perched on the threshold of the 21st century ready to provide enhanced and enabling telecommunications and IT services to the new and emerging industrial entrepreneurs. The project is intended as a strategic road map for IT and telecommunications development in Pakistan. The Parks, primarily consisting of the building blocks will offer reduced costs of delivering necessary and advanced public services and the creation of new opportunities for IT partnerships. The Parks would be characterized by broadband Internet connectivity via optic fiber cable, matchless incentives, equipped with most modern facilities, to provide a one-stop shop for the perspective investors in the IT industry. The Parks would serve as a technological model for future development and would provide an internationally recognized IT profile. Under the project, a series of IT Parks would be developed in major cities of Pakistan.

4.7	**IT Investment**

4.7.1	**Venture Capital Fund**

4.7.1.1   In order to seed the market, the government will set up a venture capital fund. This fund is to be channeled initially into existing IT companies to boost their export marketing capability and software development effort. The main objective will be to make necessary changes in laws to encourage private VC funds to operate.

4.7.2	**Micro Credit Facilities**

4.7.2.1   Micro Credit would be provided for the purchase computers and telecom equipment to help set up small software hatcheries and to develop computer education to the general public.

4.8	**Participating in International Software Exhibitions/Shows**

4.8.1   Government will fund the cost of stalls and general publicity. Stall space to be adequate for 10 to 12 software houses. (estimated cost is US$ 250,000 for each instance). Software houses will bear their own cost of travel, accommodation, marketing material, etc.

4.8.2	**Road Shows**

4.8.3   One Road Show each would be held in Dubai, London, New York, Los Angeles, Montreal and Singapore. Each road show would basically comprise a one-day seminar to which the main software consumers in the city/region would be invited. The software houses would address the seminar, highlighting the advantages of using Pakistani software capabilities. Specific, targeted effort would be made to invite prominent Pakistani owned business houses and consultants working in those countries, who in turn will be expected to propagate the message. Each road show is estimated to cost in the region of US$ 100,000.

4.9	**Electronic Commerce**

4.9.1	**Awareness and Propagation**

- Disseminate to all the stakeholders benefits, urgency and challenge of e-commerce.

- Understanding revenue generation, efficiency and competition issues

- Confusions about understanding of e-commerce.

- Differentiating requirements for B2C and B2B e-commerce

- Advantages vs. implications

4.9.2	**E-Commerce Training**

4.9.2.1   Training 5000 e-commerce professionals in implementation, technology, Business Process Reengineering, regulations @ Rs. 10k per person

- HW/SW training infrastructure

- Training for B2B exchanges, industry standards

- Technologies: XML vs. EDI

- B2C technologies for B2B

4.9.3	**Trade Facilitation**

4.9.3.1   Design of electronic forms, redesign of reporting and approval procedures for bill of Entry/Exports, I/E forms, registrations etc.

- Legislation/regulation for e-commerce documents, procedures and payments

4.9.4	**Setup EFT Network**

- Electronic inter bank transfer network connecting 1000 forex branches

- Connected with SBP and SWIFT

- Internet Merchant account facility

- Legislation, Regulation for EFT

- SWIFT access point

- Shared third party solution Vs proprietary banks network for EFT

4.9.5   **Establish Infrastructure for Research on Emerging Trends and Technologies**

- Setup EC-Pak Service provider connecting other specialized service providers for financial networks and trade facilitation networks.

- Internal automation of key stakeholders

- Well-funded national level R&D programs in software engineering in collaboration with leading domestic and foreign educational institutions

- Focus on emerging trends and technologies

- Design and implementation of EC-Pak Network

- Certification authorities

4.10   **Bench Marks and Performance Indicators**

4.10.1   Various types of incentives are being provided for promotion of IT industry. In order to judge efficacy of this policy, especially its incentive package, it is necessary that certain bench marks and performance indicators are laid down.

4.10.2   The bench marks will indicate the position as on 30th June 1999 and as on 30th June 2000. This will show normal annual progress, in the absence of IT Policy being announced now. The indicators for subsequent years ending on 30th June 2001 and so on will help in evaluating the Policy so as to bring changes therein for further improvement.

4.10.3   The bench mark/performance indicators for IT education are:

- Number of educational/training institutions

- Number of students enrolled for different programmes at the beginning of each academic year

- Number of students qualifying in different programmes at the end of each year

4.10.4   The bench marks/performance indicators to gauge extent of financial support for IT industry will be:

- The number of persons to whom loans were advanced in a year

- The amount of loan advanced in each year

4.10.5   The bench marks/performance indicators for software exports are:

- Total number of exporters as on 30th June of each year

- Total number of IT professionals employed in software houses

- Number of new exporters in an year

- The annual amount of remittances reported by State Bank of Pakistan

4.10.6   The bench marks/performance indicators for local software business are:

- Annual sales reported to income tax authorities

- Total number of IT professionals employed in software houses

- The annual salaries/wages bills

- The number of IT professionals employed as on 30th June of each year

4.10.7   The bench marks/performance indicators for hardware industry are:

- Total number of firms operating as on 30th June of each year

- The number of new firms established in the year

- Annual sales reported to income tax authorities

4.10.8   The bench marks/performance indicators for Internet Service Providers are:

- Total number of ISP_s operating on 30th June of each year

- New ISPs established in the year

- Total number of customers

- Annual receipts reported by ISPs to income tax authorities

- The annual number of inter-net users as on 30th June of each year

4.10.9   IT Division will collect statistics through market research surveys. The benchmarks for the year 2000-2001 would be compiled by 31 October 2000.

4.11   **Action Plan for FY 2001-02 and onwards**

4.11.1   The action plan for July, 2001 onwards will be prepared in the last quarter of FY 2000-01 by IT & TC Division and IT Commission. The specific projects will be identified in the light of progress made and experience gained in the current financial year.

4.12   **Implementation of Action Plan**

4.12.1   The IT Action Plan will be implemented according to its well-defined phased targets and objectives. To ensure that the plan meets its objectives consistently and that suitable midcourse corrections can be incorporated in a timely manner, a mechanism will be set up involving the government, private sector, academia and other national representatives to coordinate and implement the policy and plan elements and provide strategic oversight over the longer term.

4.12.2   Primarily, IT & TC Division and its organizations would implement the projects under the IT Action Plan. Other Governmental organizations from Federal and Provincial Governments would also implement specific projects.

4.13   **IT Action Plan Projects Portfolio**

S.No.	Name of the Project	Total Cost	Funds Needed for		
			2000-2001	2001-2002	2002-2003
		M. Rs.	M. Rs.	M.Rs.	M.Rs.
1	Training of Data Entry Operators	100.00	40.00	40.00	20.00
2	Training of Medical Transcriptionists	80.00	50.00	20.00	10.00
3	Consultancy Program for IT Development	100.00	23.00	40.00	37.00
4	Visiting Faculty Program	300.00	150.00	75.00	75.00
5	IT Research and Training Center	98.00	50.00	40.00	8.00
6	Government Online	75.00	45.00	20.00	10.00
7	Virtual IT University	1,500.00	600.00	500.00	400.00
8	Establishment of Data Network Centers at STPs with Integrated Video Conferencing Centers and Educational Network	400.00	200.00	150.00	50.00
9	Establishment of IT University at Abbottabad	300.00	200.00	50.00	50.00
10	E-Commerce Network	800.00	300.00	300.00	200.00
11	Establishment of Business Incubators and Overseas Marketing Offices	1,000.00	600.00	200.00	200.00
12	E-Governance Project	600.00	200.00	300.00	100.00
13	Scholarship and Qarze-Hasna Scheme	320.00	120.00	100.00	100.00
14	Establishment of National Testing and Accreditation Service	100.00	65.00	25.00	10.00
15	Community Internet Centers in Rural Areas	70.00	45.00	15.00	10.00
16	Establishment of IT Universities in Punjab, Sindh and Balochistan	300.00	185.00	65.00	50.00
17	Venture Capital Seed Fund	800.00	400.00	200.00	200.00

S.No.	Name of the Project	Total Cost	Funds Needed for		
			2000-2001	2001-2002	2002-2003
		M. Rs.	M. Rs.	M.Rs.	M.Rs.
20	Strengthening of IT Institutes	900.00	400.00	300.00	200.00
21	Establishment of IT Boards in Provinces	150.00	90.00	30.00	30.00
23	Training of Underemployed Engineers in Medium Term Training Courses (High End)	450.00	200.00	150.00	100.00
24	IT Seminars, Conferences and Exhibitions and Posting of IT Specialists in Missions Abroad	450.00	150.00	150.00	150.00
25	Deployment of Internet Koisks at Post Offices and Public Places	150.00	60.00	40.00	50.00
26	Establishment of Software Technology Parks	800.00	400.00	200.00	200.00
27	Provision of Low Cost PCs to Schools	150.00	75.00	65.00	10.00
28	Faculty Training Project	600.00	300.00	200.00	100.00
29	Scholarship for M.Sc. and Ph.D.	350.00	100.00	150.00	100.00
	TOTAL	10,943.00	5,048.00	3,425.00	2,470.00