



DRAFT
Information Technology Policy
Government of Balochistan

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ACRONYMS

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|----------|--|
| AGRP-B | Assistance to Governance Reforms Program – Balochistan |
| BOO | Built Own and Operate |
| BOT | Built, Operate and Transfer |
| BPR | Business Process Re-Engineering |
| CB | Capacity Building |
| CMMI | Capability Maturity Model Integration |
| CS | Computer Science |
| DFI | Direct Foreign Investment |
| EC | Electronic Commerce |
| EGD | Electronic government Directorate |
| EPB | Export Promotion Bureau |
| EPU | Export Processing Unit |
| FAB | Frequency Allocation Board |
| GHz | Giga Hertz |
| GIS | geographical Information System |
| GoB | Government of Balochistan |
| GoP | Government of Pakistan |
| HRD | Human Resource Development |
| HRDF | Human Resource Development Fund |
| ID | Identity Documents |
| ISO | International Organization for Standards |
| ISP | Internet Service Providers |
| IT | Information Technology |
| ITP | Information Technology Park |
| LAN | Local Area Network |
| LC | Letter of Credit |
| LMDS | Local Multipoint Distribution System |
| MMDS | Multichannel Multipoint Distribution Service |
| NPM | National Program Manager |
| PCB | Pakistan Computer Bureau |
| PCs | Personal Computers |
| PSEB | Pakistan software Export Board |
| PTA | Pakistan Telecommunication Authority |
| PTCL | Pakistan Telecommunication Company Limited |
| SMEs | Small & Medium Enterprise |
| UNDP | United Nations development Program |
| R&D | Research and Development |
| UNCITRAL | United Nations Commission on International Trade Law |
| WAN | Wide Area Network |
| WLL | Wireless Local Loop |

PREAMBLE

Information Technology today drives the technological and economic advancement of the developed as well as emerging economies. The Government of Balochistan is fully aware of IT being the driving force in the new millennium. Areas Identified to address the IT Action Policy are as follows and they are in consonance with IT Policy of Government of Pakistan:

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

It is envisaged that a large pool of IT experts of Balochistan from all walks of life shall participate in formulation and finalization of this document. This draft document is just a guideline and identification of the basic areas required to be addressed in the IT Policy of Government of Balochistan. The vision of the Policy is to harness the potential of Information Technology as a key contributor to development of Balochistan and the broad-based involvement of the key stakeholders is a must for its sustainable development.

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1. Introduction

Information technology (IT) has assumed unprecedented importance in the global economic arena. In Pakistan, the Government of Pakistan (GoP) has accorded a very high priority to this sector. One of the prerequisites for ensuring sustained growth of the industry 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 of Balochistan (GoB), on the same lines will act as the main facilitator, enabler, and promoter of the IT sector.

2. Background

The guiding theme for the Policy is that ‘the Government of Balochistan (GoB) shall be the facilitator and enabler to encourage the Private sector to drive the development in IT and Telecommunications’. The vision of the Policy is to harness the potential of Information Technology as a key contributor to development of Balochistan and the broad-based involvement of the key stakeholders is a must for its sustainable development. The Core National IT Policy covers several focus areas which are as follows:

2.1 Human Resource Development

Human Resource (HR) Development is imperative for the local IT industry to position the country 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.

2.2 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 Departments/Boards in provinces, increasing teledensity and introduction of new technologies such as wireless local loop for data and cable Internet.

2.3 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 to participate in Government 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.

2.4 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.

2.5 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.

2.6 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.

2.7 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 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.

2.8 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.

2.9 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.

2.10 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.

3. Rationale

The draft IT Policy for Government of Balochistan is based on the IT Policy of Government of Pakistan however there is a need to localize the policy keeping in view the constraints with in the province of Balochistan. The IT Policy will be implemented according to its well-defined phased targets and objectives. To ensure that the policy 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 supervision over the longer term. The IT Policy being a dynamic document, would be subjected to formal review set through a mechanism periodically not exceeding one year, with more area-specific monitoring carried out on a periodic basis.

4. The Vision

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

5. The Mission

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.

6. Goals

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

- 6.1 Make the Government of Balochistan a facilitator and an enabler to provide maximum opportunities to the private sector to lead the thrust in development of IT in Balochistan.
- 6.2 Develop an extensive pool of trained IT manpower at all levels to meet local and export requirements.
- 6.3 Provide business incentives for both local and foreign investors to ensure the development of Balochistan's IT sector (including the software, hardware, and service industries) and the use of its products
- 6.4 Develop an enabling legislative and regulatory framework for IT related issues.
- 6.5 Revitalize, emphasize, and support the province dormant manufacturing and research and development (R&D) potential.
- 6.6 Establish an efficient and cost-effective infrastructure that provides equitable access to national and international networks and markets.
- 6.7 Set up provisional databases that are reliable, secure, upto-date and easily accessible. These would be open databases.
- 6.8 Promote widespread use of IT applications in government organizations and departments for efficiency improvement and transparency in functioning and service provision, and to organize and facilitate access to public information.
- 6.9 Promote extensive use of IT applications in trade, industry, homes, agriculture, education, health, and other sectors with widespread use of Internet.
- 6.10 Encourage and promote the development of quality software that can capture export markets.
- 6.11 Develop a tradition of electronic commerce for both national and international transactions.
- 6.12 Encourage IT professionals (locals and expatriates) to work in Balochistan and establish software houses or extend assistance to the local industry in the form of assignments from abroad.

7. IT Policy Strategies

7.1 Human Resource Development

- 7.1.1 A major human resource issue in Balochistan is quality education and training, nurturing, and retention of technically skilled manpower. This problem is more severe in IT where technology changes are rapid.
- 7.1.2 Manpower development is imperative for the local IT industry to take root on a large scale in Balochistan, and for the province to

achieve and maintain the position of an important player in the national/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.

- 7.1.3 A working group shall be established to advise on current and emerging Education, HRD and Training needs.
- 7.1.4 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.
- 7.1.5 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.
- 7.1.6 A comprehensive plan for education and human resource development in IT shall be drawn up to meet the present and future needs of manpower.
- 7.1.7 Facilitate and encourage the training and hiring of women in the IT sector to help reduce unemployment and to utilize 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.
- 7.1.8 Facilitate and encourage the use of IT by special people to make them more productive in the society.

8. IT Education

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:

- 8.1 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 -create appropriate policies and incentives for this to occur.
- 8.2 Make participation by rural and poor segments of society in IT education a strategic priority for both social and economic development.
- 8.3 Launch a scheme for providing low-priced computers and Internet connectivity to universities, colleges and schools through a public-private sector initiative.

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- 8.4 Network all universities, engineering and medical colleges, and institutions of higher learning within the province and at national levels for improved quality of education.
- 8.5 Set up electronic libraries to ensure economical and equitable access to world information.
- 8.6 Encourage educational facilities to computerize their registration, examinations, accounting, and other activities.
- 8.7 Encourage educational facilities to adopt computer assisted learning and other IT tools to aid in the teaching process.
- 8.8 Establish virtual classroom education programs, using online, Internet and/or video facilities, to provide distance learning to a large number of individuals.
- 8.9 The Private sector and the Government shall jointly make efforts to meet the growing IT education needs.
- 8.10 Include a compulsory, modern and up-to-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.
- 8.11 Develop world-class Bachelors, Masters, and Ph.D. programs in Computer Science (CS) and related areas of IT. Develop standardized curricula and teaching materials in co-operation with public and private educational institutions, using international benchmarks for reference.
- 8.12 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.
- 8.13 Establish a provincial educational Intranet (linked to the Internet) to enable sharing, among educational institutions, of electronic libraries of teaching and research materials and faculty.
- 8.14 Attract the best students by establishing scholarship funds and Qarz-e-Hasna for IT education and training.
- 8.15 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 other provincial IT Boards.
- 8.16 Establish an HRD fund (HRDF) by the IT Department. This fund will be utilized 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.

- 8.17 Assign IT Department Quetta 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.
- 8.18 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.
- 8.19 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.
- 8.20 Provide foreign and local universities incentives to set up distance learning or resident programs in Balochistan.

9. IT Training

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

- 9.1 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.
- 9.2 Through the IT Department Balochistan, 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.

- 9.3 The Balochistan IT industry would provide a certain number of internships to fresh IT graduates each year.
- 9.4 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.
- 9.5 Introduce mandatory IT literacy courses for all levels of government service. Make IT literacy a prerequisite for induction into Gazetted positions.
- 9.6 Make a special effort to train and induct women in the IT sector.
- 9.7 Make extra efforts to educate and train people with special needs in order to give them equal opportunity in the society.

10. Infrastructure Development

- 10.1 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.
- 10.2 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.
- 10.3 The recommendations presented below will facilitate establishment of such an infrastructure.

11. Telecommunications

- 11.1 A close relationship between the government and the private sector is critical for the development of the telecommunications sector.
- 11.2 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.
- 11.3 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.

- 11.4 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 in Balochistan. 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.
- 11.5 Develop an integrated, flexible, robust, and reliable transmission network that covers the entire province and is capable of voice, video, and data transmittal.
- 11.6 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.
- 11.7 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.
- 11.8 To ensure Quality of Service, Service Level Agreements be made mandatory by the Pakistan Telecommunication Authority (PTA) between operators and the customers.
- 11.9 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.
- 11.10 Encourage competitiveness in the telecommunications sector.
- 11.11 Encourage local companies to enter the telecommunication fields that are closely associated with the infrastructure needed for an information rich society.
- 11.12 Expand connectivity using existing and new regional and global satellite and Optical Fibre links.

12. Databases and Platforms

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

sector should be encouraged to participate in the development of provincial databases.

- 12.1 Encourage and accelerate government-private partnership in establishing comprehensive databases.
- 12.2 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. This is also necessary in order to ensure that the country is not exposed to the threat of a restriction of export from a single vendor.
- 12.3 Access to databases shall be based on open Internet standards

13. Technology Parks

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 Balochistan. 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.

- 13.1 Encourage the private sector to set up such parks on BOT/BOO basis and do the same for IT Incubation Centers.
- 13.2 Charge the lower utility and infrastructure rates for bulk consumers to ITP users.
- 13.3 Plan ITP projects in Quetta.
- 13.4 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.
- 13.5 The existing software companies shall be provided land on lease at commercial rates to build their campuses.

14. Software Industry Development

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

- 14.1 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.
- 14.2 The policy recommendations presented for this area, therefore, seek to promote local software development for local needs as well as export.
- 14.3 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.
- 14.4 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.
- 14.5 Devise a phased plan for the private sector to take over a major part of the government's software development needs.
- 14.6 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.
- 14.7 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.

15. Promotion of Software Export

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

- 15.1 A Software Development Fund should be established by the Government to support the promotion, expansion, and improvement of the software industry.
- 15.2 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.
- 15.3 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.
- 15.4 Encourage equity participation of banks in software projects by setting up venture capital funds. Set up venture capital funds in Balochistan to encourage private local and foreign funds to establish privately managed venture capital funds.
- 15.5 Encourage the setting up of a 'content industry', comprising intellectual property such as encyclopedias, compositions, photographs, and other information of international interest.
- 15.6 Set fix yearly targets for software export and contact PSEB and PASHA to guide in export marketing. Earmark adequate funds and provide infrastructure to promote software exports.
- 15.7 Encourage local business to invest in software industry. Conduct awareness campaigns to highlight the immense potential and high returns from this industry.
- 15.8 Encourage major multinationals operating in Balochistan to set up software facilities and bring international business through their established channels.

16. Technology Transfer and R&D

- 16.1 Identify key technology areas and provide fiscal support and incentives to encourage local technology development.
- 16.2 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.
- 16.3 Encourage expatriate IT experts and educationists to spend their annual vacations in Balochistan to transfer their knowledge and share their experiences with local universities. Fund such visits.
- 16.4 Setup an Information Resource Center with on-line linkages to reputed scientific information repositories, accessible from all major cities of Pakistan

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

17. Internet

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 Balochistan: (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. 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.

- 17.1 Create an environment that allows for as much competition as possible. Ideally, this should extend as far as the provision of physical network infrastructure.
- 17.2 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.
- 17.3 Permit and encourage existing and future ISPs to provide Backbone and Peering services. Encourage them to set up different nationwide physical delivery and access mechanisms via IP Radio, Fibre, Laser and Microwave.
- 17.4 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
- 17.5 Establish robust and reliable Network Access and Peering Points both by the PTCL as well as the Private sector in order to locally route traffic on the Internet

18. IP Delivery Mechanisms

The rapid roll-out of new telecommunications infrastructure is critical to the rapid growth of the Internet in Balochistan. It is, therefore, important that any telecommunications framework encourages the development of 'alternative physical delivery mechanisms'.

- 19.1 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.
- 19.2 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.
- 19.3 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.

19. Incentives

The government of Balochistan 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.

- 19.4 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.

- 19.5 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.
- 19.6 Remove the anomaly of tax deduction at source for bandwidth purchase by ISPs, PTCL and other telecommunications service providers.
- 19.7 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, shall 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.
- 19.8 Encourage investments in all phases of IT businesses, like idea generation, start-up, growth ramp-up, and exit process.
- 19.9 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.
- 19.10 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.
- 19.11 Assist and give incentives to private companies for acquiring ISO/ CMMI and other certification for quality standards for the IT industry (e.g., subsidize 50% cost of such activities).
- 19.12 Give commercial and investment banks special tax concessions on earnings from investments in IT ventures. Establish a special pool of debt for IT companies.

- 19.13 Give special incentives to foreign universities and companies for setting up development and educational centers in Balochistan by venture capital funding.
- 19.14 Enhance the limits for export refinance facility for software exports based on previous years' performance, to help finance established software companies.
- 19.15 To retain qualified faculty within the province, IT faculty at universities and institutions shall be exempted from Income Tax.
- 19.16 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.
- 19.17 Allow 100% depreciation for hardware, software, and other equipment in the first year of its use in the IT industry.

20. IT Promotion & Awareness

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:

- 20.1 Provision of continued support and funds by Government of Balochistan for the participation in world IT/computer trade fairs, which is vital for the IT industry.
- 20.2 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.
- 20.3 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.
- 20.4 Declaration of the next fiscal year as 'IT Year'.
- 20.5 Organization of special events during this year, such as Provincial IT Conference and Computer Exhibitions in Quetta and other major cities, mobile computer exhibitions, international conferences and exhibitions, IT competitions at various levels, and special programs on electronic media.

21. IT Usage

21.1 IT in Government

To embark on an aggressive program to improve efficiency and provide quality services to the citizens of Balochistan, 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. The e-government model for Balochistan in line with federal initiative is a gigantic task. It may take 3-5 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. It can be however benefited through E-Government implementation at federal levels.

- 21.1.1 In the government sector, at present, 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 IT Department Balochistan may start consulting IT & TC Division in matters relating to IT.
- 21.1.2 On the pattern of the IT Division, each provincial government shall create an IT Department Balochistan 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.
- 21.1.3 A minimum of 2% of the budget shall be allocated for IT Services to provincial IT departments for developing IT infrastructure and conducting training at all levels in the government.
- 21.1.4 Working Groups shall be formed to create awareness in all Government organizations about the utility of computers and IT.
- 21.1.5 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.
- 21.1.6 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.
- 21.1.7 The IT department Quetta 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.

- 21.1.8 Provincial 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.

21.2 IT in the Economy: E-Commerce

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. 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.

- 21.2.1 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.
- 21.2.2 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.
- 21.2.3 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.

- 21.2.4 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.
- 21.2.5 Communities and non-governmental organizations often have the best local connections for efficient and appropriate development efforts. Encourage alliances that work through these agents.
- 21.2.6 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.
- 21.2.7 Greater role of SMEs in exports through e-commerce by providing low cost accessibility to markets and services which were not available before.
- 21.2.8 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.
- 21.2.9 Establish Electronic Commerce Wing in the IT Department to govern all the electronic commerce affairs in Balochistan.
- 21.2.10 Plan and implement different aspects of electronic commerce, such as awareness, promotion, education and training; EC infrastructure implementation; the Internet and other emerging technologies for EC services; and laws, regulations, and standards for EC.
- 21.2.11 To encourage computerization all registered organizations shall be given tax incentives for computerization.
- 21.2.12 All trade transaction like L/C, bills of lading, etc. shall be encouraged to be made through electronic means.
- 21.2.13 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.
- 21.2.14 Manufacturers and suppliers shall be encouraged to show bar codes on every item sold in the country.
- 21.2.15 Facilitate international trade through an e-commerce infrastructure

22. Legislation and Regulations

22.1 Legislation

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.

- 22.1.1 Digital Signature Act - Laws should be enacted and/or amended to recognize digital IDs, signature certificates, and electronic authentication and verification.
- 22.1.2 Computer Crimes Act
- 22.1.3 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.
- 22.1.4 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
- 22.1.5 Admissibility of copies of electronic records in an administrative or court proceeding.
- 22.1.6 Review of existing laws to remove any contradictions that may hinder the implementation of IT Policy.
- 22.1.7 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.

22.2 Regulations

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

- 22.2.1 Focus on creating a fair and competitive environment, based on the principles of free market and open access.
- 22.2.2 Give network operators the freedom to build their own backbone and local access. Encourage combined and collaborative efforts in this regard.
- 22.2.3 Facilitate rapid deployment of infrastructure for promotion of IT services.
- 22.2.4 Review government management and procurement policies to encourage competition among telecommunication services providers in technical service standards, prices, and development of broadband services.

- 22.2.5 Through the PTA, ensure that the Authorized Service Providers meet network standards.
- 22.2.6 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.

22.3 Standards

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:

- 22.3.1 Easier sharing of data
- 22.3.2 Easier sharing of skills
- 22.3.3 Economic usage of resources and
- 22.3.4 Improved product quality.
- 22.3.5 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.
- 22.3.6 The government should use the standards already developed by the IT Division, Government of Pakistan.
- 22.3.7 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.