Ministry of Science & Technology

IT Policy and Action Plan

Including initial steps required for updating and Implementing a modular

National IT Policy & Plan

Government of Pakistan

August 2000

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Ministry of Science & Technology

IT Policy and Action Plan

SECTION I – MESSAGES

Government of Pakistan

August 2000

Message from Prof. Dr. Atta-Ur-Rahman,
Minister for Science and Technology

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.

The present initiative of launching IT Policy and Action Plan by the Ministry of Science and Technology (MoST) has revived serious interest in developing the IT industry in Pakistan. Impressed by the commitment, sincerity and responsiveness of the present Government towards the sector, stakeholders in Pakistan and abroad have responded enthusiastically to helping the Government implement a proper and adequate package of reforms and incentives geared toward achieving accelerated growth in the IT industry.

The detailed policy deliberations and intense discussions by the Working Groups have resulted in the compilation of the National Information Technology Policy and Action Plan Recommendations. The document outlines the areas in which further development and resource allocation is required and defines the roadmap in order to achieve significant progress in a limited time span. It will also form the basis on which specific policy recommendations will be further elaborated, plans of action defined, and implementation arrangements formulated. It provides a synthesis of the previous IT policy documents drafted by disparate groups, and establishes a common platform on which a more rigorous planning exercise can be carried out.

Most importantly, the document requires a strong national commitment to promote and facilitate the growth of IT in Pakistan, which will signal the Government's intent to fully support the initiative with all resources at its disposal. The exhaustive task of formulating strategies, specific policy elements, action areas, and program components must now begin in earnest. The following Working Groups in the respective areas intensely 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 Organisations 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.

The Policy mission is the rapid development of infrastructure in synchrony with the creation of highly trained individuals and teams and directing them at transforming our society into a prosperous and dynamic one through the creation and free flow of information and knowledge. The Policy is directed at encouraging and assisting the entrepreneurial spirit, and making the fruits of this technology available to every citizen.

The major goals set to realise the vision behind the IT policy include the role of the Government as a facilitator and an enabler to give maximum opportunity to the private sector to lead the thrust in development of IT in Pakistan; the development of an extensive pool of trained IT manpower at all levels to meet local and export requirements; to 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; the development of an encouraging legislative and regulatory framework for IT related issues; the deployment of an efficient and cost-effective infrastructure that provides equitable access to national and international networks and markets; the promotion of widespread use of IT applications in the Government; and establishing a tradition of electronic commerce for both national and international transactions.

Core IT Policy strategies therefore focus on human resource development, infrastructure development, telecommunications, databases, software industry

development for exports and local markets, exponential increase in Internet usage and fiscal and regulatory incentives.

The final draft of the IT Policy and Action Plan was placed on the Internet and after inviting comments form all the stakeholders and making necessary revisions and modifications, the final version of the Policy has been completed. This may be revised from time to time after taking into account the technological development and changing local needs.

Some initiatives have already been undertaken in the key areas to stimulate the growth in this sector. The cost of Internet bandwidth of PTCL was reduced up to 53% which has led to reduction in Internet end user prices and improvement in quality of service for the Internet users. Free Internet connections are being extended to public sector Universities under an agreement with the private sector ISPs and PTCL. To facilitate the private sector, IT and telecom industry and to enhance the investor's confidence in the Government, processing period for license applications in the deregulated sector by the PTA has been reduced to 7 days from several months. In order to deliver efficient IT infrastructure, PTCL would now provide international bandwidth and Internet connectivity to the ISPs and other corporate customers within 4 to 8 weeks. Previously this connectivity used to take 4 to 12 months. Training of thousands of blue collar IT workers for data entry and transcription services is being initiated and would be completed within 6 months.

To promote Electronic Commerce in Pakistan, the State Bank of Pakistan (SBP) has agreed to allow the opening of Internet Merchant Accounts within Pakistan, and notification in this regard would be issued shortly. This was a major hindrance in start of E-commerce activities in the country. To facilitate the software export industry, SBP has agreed to allow banks to accept the Contracts as collateral for the software exporters to qualify them for export refinance scheme. Previously this was only permitted against letter of credits, which do not exist in the software export business. SBP has also agreed to allow software-exporting companies to retain 25% of their export earnings in foreign exchange accounts. Hitherto, the software exporters did not have any such facility. The State Bank of Pakistan would issue notifications to these effects shortly.

An overseas Strategic Advisory Board of expatriate Pakistanis in IT and related financial sectors has been formed with participation of key Pakistanis and volunteering themselves not only for advice but also for actual investment and participation in IT projects and activities in Pakistan. The results of these initiatives across a broad field in the IT sector should become visible in the near future.

The IT Policy and Action Plan have been prepared after a monumental effort during the last two months. A large number of professionals have worked extremely hard to make it all happen. I am most indebted to Mr. Salman Ansari, Mr. Shahid Mahmud, Dr. Jawaid Ghani, Dr. Syed Irfan Hyder, Dr. Imran A. Zualkernan, Mr. Muhammad Khalid Javed, Mr. Zafar Ismail, Mr. Ahsan Zahir Rizvi, Mr. Asad Karim, Mr. Salman Taseer, Mr. Ahmad Allauddin, Mr. Humayun Mazhar, Mr. Alvi Abdur Rahim, Mr. Farrukh Zafar, Mr. Sohaib Abbasi, Mr. Ali Jameel, Mr. Masood Jabbar, Mr. Safi Qureshey and all those colleagues whose names are mentioned in the acknowledgments part of this document.

This document now represents the beginning of a historic effort and the extent to which we succeed will depend on the efficiency with which we can implement the recommendations. I am confident that I will continue to receive guidance and enthusiastic support from various national and overseas experts and that, Inshallah, we will soon firmly embark on the road to progress and prosperity through the implementation of the IT Policy and Action Plan.

Prof. Dr. Atta-Ur-Rahman,
Minister for Science and Technology
Government of Pakistan

August 22, 2000

Message from Syed Mazhar Ali, Chairman
Information Technology Commission

Realizing the importance of IT in the growth of national economies, in the last decade, a number of developing countries have wisely invested in the growth of IT, due to which they are reaping the benefits through better governance, export of software, creation of jobs and competitiveness of their trade and industry in the global economy. We are fortunate that under the direction of Honorable Chief Executive, General Pervez Musharraf, Professor Atta-ur-Rahman, Minister for Science & Technology has infused new life and tremendous enthusiasm for the future of IT in the country.

There is thus hope that although quite late but with dedication, commitment, planning, adoption of suitable policies, provision of the requisite resources and by achieving consensus of all stakeholders it may 'still be possible' to overcome the effects of years of neglect.

To speedily board the IT bandwagon, it was essential to chart a course of action. For this purpose it was decided to formulate a National IT Policy and Action Plan, the corner stone of which is that the Government shall act as a facilitator and enabler for the private sector, which will lead the way in the Promotion of IT.

Under the leadership and guidance of Prof. Atta-ur-Rahman, the IT Commission has had the honour of gathering a large number of dedicated and committed Pakistanis both within and outside the country, who, through Herculean efforts and working voluntarily, have within the short span of two months finalized the National IT Policy.

Unlike the half baked efforts in the past, most of which have failed, to achieve success, it has been ensured, that firstly there is unwavering commitment from the government at the highest level, and secondly, appropriate implementation, monitoring and review mechanism is put in place alongwith the framing of the Policy.

As Chairman of the IT Commission it has been my privilege and honour to be a part of the exciting and exhilarating experience of working with such a large number of dedicated Pakistanis who have been working tirelessly and selflessly in this project of national importance. This exercise has reinforced my faith in the country and its people. With the right leadership our countrymen will endure any pain, counter any challenge and scale any heights for the future of the country.

In the end I would like to thank Prof. Atta-ur-Rahman, Mr. Javed Masud, the members of the IT Commission, the Working Groups and the Editorial Board alongwith various Consultants and IT Professionals, especially the dedicated group of overseas Pakistanis, who have all made possible what seemed to be an impossible task. May *Allah-Ta'ala* bless them all.

Syed Mazhar Ali

Senator (Retd)

Ministry of Science & Technology

IT Policy and Action Plan

SECTION II – ACKNOWLEDGEMENTS AND DOCUMENT STRUCTURE

Government of Pakistan

August 2000

Acknowledgements and Document Structure

The IT commission was asked by the Chief Executive's Secretariat to prepare the IT Policy. Under an initiative of the Vision 2010 under Mr. Ehsan Iqbal, the NDO had prepared a draft last year but could not be made functional. The current task was started on the first of April with additional impetus from the Minister of S&T.

It is always a difficult task to try to manage divergent interests, perceptions and directions and try to come up with a coherent direction and Policy. Despite all odds, the spirit, which has made this Document come to life, is the tremendous enthusiasm, initiative and participation of the whole IT community.

Many items in this Policy documents will give way to change as the industry matures. Obvious issues like protection of the industry for the manufacture of hardware, etc will enable the players to move to more niche market oriented value added products. The Policy will accordingly be modified as the industry matures. The WTO IT Agreement will in any case dictate the speed with which we will have to move, in order to make sure that we become and remain a mainstream player.

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. This original effort was followed up by enhancements and inputs 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 like "Dareecha" (www.dareecha.org) a US based Networking Forum and Non-profit Strategic Consulting Organization". Ongoing support form the Pakistan-American Advisory Board, being Preside by Masood Jabbar, President Sun Microsystems is providing valuable key inputs in to the implementation of the Policy items.

Deleted:

Eleven working groups were formed which addressed specific issues. These were:

S/No	Group	Name	Designation	Company/

				Organization
1.	HR Development, Training and Education	Dr. Jawaid Ghani	Chairman	Punjab IT Board
2.	IT in Govt. and Databases	Mr. Zafar Ismail	Secretary	
3.	IT Market Development and Support	Mr. M. Khalid Javed	MD	PSEB
4.	IT Fiscal Issues	Mr. Salmaan Taseer	Chairman	WorldCall Payphones Ltd.
5.	Telecomms, Convergence and Deregulation	Mr. Shahid Mahmud	CEO	Inter Active Comms.
6.	Cyber Laws, Legislation and IPR	Mr. Ahsan Zahir Rizvi	Partner	Rizvi Isa & Co.
7.	IT and Telecom Manufacture and R&D	Mr. Asad Karim	MD	Comcept Pvt. Ltd.
8.	Internet	Mr. Sanaullah Bhutta	President	ISPAK
9.	Software Export	Dr. Imran A. Zualkernan	CEO	Askari Info. Systems Ltd.
10.	E-Commerce	Dr. Irfan Hyder	Deputy Director	IBA
11	Incentivising IT investment	Mr. Ahmed Allauddin	Chairman	Computer Society of Pakistan

A team headed by Mr. Shahid Mahmud was assigned the task of pulling all the inputs together into a coherent document. They did an excellent and an almost Herculean editorial work that was accomplished in a short time.

Dr. Jamil Masud contributed with his 'way forward' document, which charts the implementation philosophy. This has now been integrated, into the main Policy document.

In several locations, mention of specific institutions is made (e.g. IBA, LUMS, etc). This does not mean that others have been excluded from the process.

It was decided very early that since the sector is very dynamic, the Policy and Plan would be reviewed every quarter and updated under a modular mechanism focused on established targets. Achievements in each segment will be published on the Web to ensure that the initiative is kept on track. Any mistakes and shortcomings will be ironed in these review processes.

Though it is difficult to acknowledge the contribution of each person in this document, we have attempted to present some names in this section of Acknowledgements. In case some names have been inadvertently missed out, we would like to apologize in advance.

A very special thanks goes to Prof. Dr. Atta Ur Rahman and his team in the Ministry of Science and Technology and to Mr. Javed Masood, Secretary IT who provided the high level of motivation, support and mobilization to complete this critical task in a short time. Without the able guidance and assistance of Mr. Alvi Secretary IT Commission and my overworked assistant Mr. Hussain, these documents would be incomplete.

The best part of this work was that it was on a voluntarily basis by a dedicated team of Pakistanis

And the most fascinating part is that while the Policy is still being framed and discussed, implementation on several short term Action Points has already begun. Issues like bandwidth prices and software houses' needs from the SBP have mostly been resolved. It is expected that in the next few months several points will move out from the 'to-do' list to the 'already done' list!

The Document Structure

The document is split into three main segments. The presentation of this document enables the reader to grasp the background as well as some of the proposed activities, which will enable this policy to take a practical shape:

> This first two contain the messages as well as acknowledgements and document structure

> The next segments are the documents relating to **The Policy direction**: *The core Policy document is about 32 pages.* The rest are background materials and implementation plans. This is the core document, which will be the cornerstone of the Plan and its implementation. This document will be reviewed on a quarterly basis.

> **The Action Plan**: This constitutes the accomplishments till date as well as recommendations of the working groups. The Action Plan is a changing document and will have action items moving out of this to a progress review document, which will be made, on a monthly basis.

> The Action Plan is followed by a proposed direction for **The Next steps** for implementation of the action items.

The Implementation Plan: The current document carries only a brief sample of the detailed work being done by some of the teams. All the submitted documents and those under work have not been included since this would have made this current document too voluminous. The current insertions are only to serve as an example. The detailed documents will be hosted on the Web.

In order that each segment may be read independently, a certain degree of duplication has been deliberately kept.

In the current document, all possible upto date inputs have been incorporated. These will be further, refined with time and updated on the web site. A version of the documents will be rendered in 'pdf' format on the web to enable convenient printing.

A working group is being constituted to work on the "template" for future changes so that these can be institutionalized and can follow a more conventional albeit fast path. This is highlighted throughout the document.

Salman Ansari
salman@super.net.pk

Coordinator,
IT Policy and Plan

The Team

The eleven teams had considerable support and inputs from several professionals outside the main teams. As mentioned earlier these also included several top IT professionals from the USA.

The following list is alphabetically sorted. Though many people participated in the process, we have only got the following names back from the team leaders and organizations involved in this process. Any omissions of names due to any oversight are regretted. Please let us know if any major omission has been done so that we may rectify it accordingly.

S #	Name	Organization	S #	Name	Organization
1	Brig (Retd.) Mohammad Yasin	SDPI	56	Mr. Imran Qureshi	Cyber Access
2	Col. Sajjad Hussain Shah	SCO	57	Mr. Imtiaz Ahmed Malik	Goldsoft
3	Dr. A. Q. Mughal	UGC Advisor	58	Mr. Inayat A. Ibrahim	CSP
4	Dr. A. S. H. Bukhari	Sindh University Jamshoro	59	Mr. Inayat Ullah Khan	PTA
5	Dr. Aftab Ahmed	Fauji Foundation Institute	60	Mr. Jamal Nasir Khan	Supernet
6	Dr. Amanullah	BZU Multan	61	Mr. Javed Agha	PRAL
7	Dr. Aquil Burney	Karachi University	62	Mr. Javed Naushahi	CSP
8	Dr. Arif Zaman	LUMS	63	Mr. Kamran Iqbal	Microsoft Pakistan
9	Dr. Arshad	NUST	64	Mr. Kashif Ahmad	Dareecha
10	Dr. Ashraf Iqbal	LUMS	65	Mr. Kashif Zafar	Dareecha
11	Dr. Asim	Cressoft	66	Mr. Kh. Sami Askari	CSP
12	Dr. Ayub Alvi	FAST	67	Mr. Khalid Khan	Inter Active Comms
13	Dr. Hilal Qureshi	FAST	68	Mr. Khawar Saeed Akhtar	Income Tax
14	Dr. Humayun Mian	Systems Ltd.	69	Mr. Khurram P. Rafique	Indus Technology

15	Dr. Ijaz H. Khawaja	PCB	70	Mr. Khurrum Rafiq	Software Designers
16	Dr. Irfan Ahmed	PACE	71	Mr. M. M. Khan	NIFT
17	Dr. Khawar Zia	Informatics Beaconhouse	72	Mr. Mahmood Siddiq	SBP
18	Dr. Khursheed	US Publishers	73	Mr. Majyd Aziz	Ex. Chairman SITE Association
19	Dr. M Usman	EPB	74	Mr. Masood Bhatti	PTCL
20	Dr. S. Zahoor Hassan	LUMS	75	Mr. Masood Jabbar	Sun Microsystems Inc.
21	Dr. Saeed Kazmi	BMS Projects	76	Mr. Mian M. Shafiq	NTC
22	Dr. Shahid Hafeez	NED University	77	Mr. Mir Hussain Ali	Govt of Sindh
23	Dr. Sohail Aslam	Techlogix	78	Mr. Mirza Anwar Hussain	CDC
24	Dr. Syed M. Zaidi	NUST	79	Mr. Mohsin A. Qazi	Comcept
25	Dr. Zubair Sheikh	KIIT	80	Mr. Muhammad Ishaque	MoS&T
26	Mr. A. Shakoor Amjad	ITL	81	Mr. Munir Qureshi	CBR
27	Mr. Abdul Aziz Sabbir	UAF	82	Mr. Nooruddin Baqai	PTCL
28	Mr. Abdul Gaffar	Kalsoft	83	Mr. Omar Asghar	ABN-AMRO Bank
29	Mr. Abdul Haiy Khan	IT Educationist	84	Mr. Pervez Iftikhar	Siemens
30	Mr. Abdul Sattar	Sattar & Sattar & Co.	85	Mr. Rehan Walid	SBP
31	Mr. Aftab alam	Govt. of Sindh	86	Mr. Sajjad latif Awan	PTA
32	Mr. Ahmed Nadeem Syed	Supernet	87	Mr. Salman Qadri	Saltec
33	Mr. Akhai	SBP	88	Mr. Sanaullah Bhutta	ISPAK
34	Mr. Akhtar Ahmed Bajwa	PTCL	89	Mr. Shabbar Zaidi	Fergusons
35	Mr. Ali Jameel	Jahangir Siddiqui Investment Bank	90	Mr. Shah Hassan	CTI

36	Mr. Amir Usmani	SBP	91	Mr. Shahab Khan	Planwel
37	Mr. Amjad Farooq	MCB	92	Mr. Shahbaz Akber	Member Data-Comm Group
38	Mr. Amjad Jamshed	Income Tax	93	Mr. Shahid Mirza	Saztel
39	Mr. Ansar ul Haque	Cybernet	94	Mr. Shahzad A. Rashid	CSP
40	Mr. Arif Ansari	Dareecha	95	Mr. Shahzad Khan	Dareecha
41	Mr. Arif Siddiqui	Standard Chartered Bank	96	Mr. Shaukat Usman	MoS&T
42	Mr. Ashir	Cressoft	97	Mr. Sheikh Afzal	PTCL
43	Mr. Atiqur Rahman	Jamal Yellow Pages	98	Mr. Sohail Jawwad	SBP
44	Mr. Ayaz Ghaznavi	Computer World	99	Mr. Tauqir Ghani	Softnet Systems
45	Mr. Dewan M. Y. Farooqui	Govt.of Sindh	100	Mr. Waqas Muslim	FPCCI
46	Mr. Faisal Khan	Net Access	101	Mr. Zafar Iqbal	Customs
47	Mr. Farrukh Zafar	Dareecha	102	Mr. Zainul Abedin	Ex CDC
48	Mr. Furqan Qureshi	Citi Bank	103	Mr. Zia Khan	Xenosys
49	Mr. Hamza Matin	PASHA	104	Ms. Shazia Yaqub	IBA
50	Mr. Hasan Anwar Rizvi	Rizvi Isa & Co.	105	Ms. Zainab Hameed	IBA
51	Mr. Humayun Qureshi	KIIT	106	Syed Abdul Rafey Qadri	Galactica
52	Mr. Iftikhar A. Soomro	Govt of Sindh	107	Syed Ahsan Navaid	Infotrain
53	Mr. Ijaz Hussain Kazi	Govt of Sindh	108	Syed Asim Zafar	Indus Technology
54	Mr. Imran A. Riyaz	Member Hardware Group	109	Syed Khurshed A. shah	Indus Technology
55	Mr. Imran Akhtar Shah	WOL	110	Syed Mustafa	NEPS

Ministry of Science & Technology

IT Policy and Action Plan

SECTION III – EXECUTIVE SUMMARY AND BACKGROUND

Government of Pakistan

August 2000

Executive Summary

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 Pakistan-American Advisory Board, 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.

At the meeting of over 100 Information Technology Professionals and service providers held in Islamabad on 1st April, 2000, under the auspices of I.T. 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.

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.

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.

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

The first draft of the Policy was put on I.T. Commission's websites in the 1st week of May and comments were invited through press advertisements. A large number of comments and suggestions were received in response to this 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.

Core IT Policy strategies therefore focus on human resource development, infrastructure development, telecommunications, databases, software industry development for exports and local markets, exponential increase in Internet usage and fiscal and regulatory incentives.

The I.T. Policy strategies have been proposed under several focus areas. These include:

Human Resource Development

I.T. Education
I.T. Training

Infrastructure Development

Telecommunications
Data Bases and Platforms
Technology Parks

Software Industry Development

Local Software Industry
Urdu & Regional Languages
Promotion of Software Export

Hardware Industry Development

Manufacturing
Technology Transfers and R&D

Internet

Internet Development
Availability

Incentives

Fiscal Incentives
I.T. Promotion and Awareness

I.T. Usage

I.T. in Government
I.T. in Economy
I.T. in Education

Legislation and Regulations

Legislation
Regulation

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.

While the policy is still being framed and finalized, implementation on several short term Actions has commenced. Issues like bandwidth prices and State Bank of Pakistan regulations for software industry have already been resolved. It is expected that in the coming weeks and months several other actions will also have been implemented.

Background

There have been several previous attempts by the Government aimed at promoting and facilitating the growth of the information technology industry in Pakistan. Although no clear progress monitoring or cost-benefit analysis for the industry exists, the results of such sporadic attempts have nevertheless been disappointing in terms of achieving substantial improvements in key performance indicators (software exports, manpower training, high tech industrial growth, etc.).

One of the prerequisites for ensuring sustained growth of the industry is the provision of a definite roadmap consisting of policy, legislative, financial, and operational guidelines which can provide a stable basis 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.

Past attempts in this respect have failed largely due to four chronic shortcomings in this key function of the government:

> Serious inadequacies in the policy and plan formulation;

> The absence of adequate capacity within the government to implement, manage, monitor, and respond to the industry's needs;

> Lack of a broad based Private-Public Sector consensus on the Policy; and

> The lack of a strong national commitment, supported by commensurate financial and executive power, to help achieve required targets

As a consequence of these deficiencies, the various IT policy and planning documents prepared in the past did not have consensus or rigorous analysis, lacked institutional ownership and credibility, and contained serious omissions and oversights in both scope and content. The lack of an institutional policy

formulation framework has prevented such initial attempts from being developed further into effective planning and policy instruments.

To whatever extent these rudimentary initiatives have been able to prepare policy drafts, their implementation has been further eroded by a conspicuous absence of capacity within the government machinery for allocating institutional responsibilities, providing implementation and management support, and ensuring adequate program monitoring and evaluation. As a result, even workable policy recommendations have never been sufficiently implemented, nor has any appreciable momentum been achieved in moving the industry forward.

Finally, the complexity and cost of providing a strong boost to IT development in Pakistan has not been fully appreciated in the past, particularly at the highest executive level, and the required resources have not been committed.

In the absence of a clear and unequivocal commitment to assigning due priority and resources to the sector, the few fragmented efforts that have been made in the right direction have invariably been stalled or rescinded and business confidence in the prospect of IT growth in Pakistan has thus remained low.

Given the tremendous pace of advancement of the global IT industry, and the indifferent results of previous attempts in Pakistan to reap commensurate benefits, it was imperative that the present initiative be carried out more thoughtfully and systematically. Failure to do so would not only further disillusion the business community and key stakeholders who have much higher expectations of the present administration, but also widen the chasm between Pakistan and the rest of the international community in terms of IT capabilities. This will have strong negative implications for the country's future growth, not just in the narrow terms of the IT industry, but also in overall economic, trade, and political terms.

It is therefore the endeavor of the present IT initiative to carefully consider the causes of past failures and incorporate the lessons learned in evolving a more effective course of action for attaining real progress in meeting planned IT objectives.

Current IT Initiative

The present initiative undertaken by the Ministry of Science and Technology (MoST) has revived serious interest in developing the IT industry in Pakistan. Impressed by the commitment, sincerity and responsiveness of the government towards this sector, stakeholders in Pakistan and abroad have responded enthusiastically in helping the government implement a proper and adequate package of reforms and incentives geared toward achieving accelerated growth in the IT industry. Towards this end, several extensive discussions have been held amongst industry, academia and the government, and many specific issues constraining growth have been identified.

The initial policy discussions have resulted in the compilation of the National Information Technology Policy and Action Plan Recommendations. Given the severe time constraints under which this document was prepared through entirely voluntary efforts, it is a major achievement in defining the overall direction cost and resources required in obtaining an effective plan of action for the growth of I.T in Pakistan. This document outlines the areas in which further development and resource allocation is required and defines the scope of evolving and implementing meaningful progress. It will also form the basis on which specific policy recommendations will be further elaborated, plans of action defined, and implementation arrangements formulated. It provides a synthesis of the previous IT policy documents drafted by disparate groups, and establishes a common platform on which a more rigorous planning exercise can be carried out

Most importantly, the document seeks approval of a strong national commitment promoting and facilitating the growth of IT in Pakistan, which will signal the government's intent to fully support the initiative with all resources at its disposal. Once such a commitment is available, the exhaustive task of formulating strategies, specific policy elements, action areas, and program components will be put in place.

Ministry of Science & Technology

IT Policy and Action Plan

SECTION IV – THE IT POLICY

Government of Pakistan

August 2000

The IT Policy

The Vision

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

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.

Goals

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

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.

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

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

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

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

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

___Set up national databases that are reliable, secure, upto-date and easily accessible. These would be open databases.

___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.

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

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

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

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.

IT Policy Strategies[1]

Human Resource Development

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.

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.

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

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[1] The Term "IT Division" in this document denotes the IT and Telecommunications Division and its associated departments and organizations.

development in IT shall be drawn up to meet the present and future needs of manpower. Also, a working group on the same lines shall be established to advise on current and emerging education and training needs.

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

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.

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.

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

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.

Facilitate and encourage the use of IT by people of spaecial needs to be able to make them more effective in society.

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:

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.

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

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

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

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

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

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

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

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

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.

Develop world-class bachelors, masters, and PhD 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.

To address the critical shortage of qualified IT faculty, establish Faculty Chairs by attracting foreign and expatriate faculty and arrange faculty development programs.

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 (through distance learning and video conferencing).

Attract the best students by establishing a scholarship fund for IT education and training.

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 through representation on the

Establish an HRD fund (HRDF) to be 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, the Cell will mobilise financing through expatriate Pakistani community, international agencies and global IT firms.

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.

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.

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.

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

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.

Work Visas for foreign I.T faculty shall be simplified and expedited.

IT Training

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

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.

Through the Institutional Development Cell, 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.

The IT industry would be bound to offer a certain number of internships to fresh IT graduates each year. This activity to be monitored by ITC and Institutional development cell for compliance.

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.

___Introduce mandatory IT Literacy courses for all levels of civil and military personnel. Make IT literacy a prerequisite for induction into gazetted positions.

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

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

___Infrastructure Development

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.

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.

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

Telecommunications

A Telecom Policy is under preparation and shall be a detailed blueprint based on the basic precepts of this IT policy.

___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. Though a large part of the sector is already deregulated, in case the PTCL cannot be privatized in a short time frame, an earlier total deregulation may be considered.

It is however felt that The Telecom industry shall be deregulated at the earliest point to be able to at least provide affordable, competitively priced Internet connectivity – low and high bandwidth -- for a larger community of users. Special measures are being taken to separate the provisioning of Bandwidth and Access for Education, Software needs, Data and Internet from restrictions which are being caused by the current regime.

Increase telephone line penetration rate by expanding the existing telecommunications network and providing new ones employing modern technologies—this will minimize the capital cost of expansion. The government will permit private telecom operators

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for supply of basic infrastructure and services, either as independent licences or under the umbrella of the PTCL exclusivity if needed.

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, open up the 3, 4, 5 and 20-40 GHz bands for growth if the WLL for Internet, Cable and voice communications.

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

Revise PTCL rates and tariffs for all telecommunications services down from time to time, so that the cost is reasonable and consistent with the economic realities of the country. Establish the tariff at par with or below the charges prevalent in the regional and international markets to remain competitive. In the competitive environment, the market forces would determine the pricing of these services. Regulation and intervention in this case will take place only if absolutely necessary.

The bandwidth rates both domestic and International will be brought down dramatically 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.

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

Encourage telecommunication companies and carrier network service providers to upgrade rural telecommunications facilities. In this equitable Interconnect agreements, which protect the investments of all operators (private-public) will be put in place to restore confidence of the industry in due process.

Encourage competitiveness in the telecommunications sector. Ensure that full competitiveness is achieved in all telecommunications services and infrastructure provision and companies to ensure full

competitiveness like data, voice, and international connectivity are operational by 31 December 2002. (or earlier in case of earlier deregulation). The necessary regulatory mechanism needed for such a purpose should fall in place very soon.

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

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

___Create an environment in which the government, telecom operators, and regulators work together to ensure that access to advanced IT enabling telecommunications services is available to all citizens including commercial consumers, educational institutions, hospitals, libraries, and government functionaries - regardless of their location and at a reasonable cost.

___For all projects of the Government, the private sector will be encouraged to participate and will compete on equal terms with the government organizations (e.g. NTC or the PTCL).

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

Take appropriate actions to launch Pakistan's own satellite at the earliest. The neglect and mistakes of yesteryears have been very expensive in terms of loosing slots and strategic and financial opportunities.

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 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.

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:

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

Through the IT Division and Computer Society of Pakistan, set standards to ensure that national databases are developed based on open standards especially in the government sector.

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.

Access to databases shall be based on open Internet standards

Technology Parks

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

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

In order to expedite the setting up of TP's, the facilities/incentives being offered by Export Processing Zone Authority (EPZA) & 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 TP's and IT projects.

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

Expedite TP projects in Karachi and Lahore and Islamabad.

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

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

Software Industry Development

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.

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

Development of Local Software Industry

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:

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.

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.

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

Give preference to the private sector to develop software for government and non-classified Defence projects.

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.

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.

Urdu and Regional Language Software Development

In order to bring IT to a large number of people as possible and to reduce the deep and emerging divide of the IT 'haves' and 'have-nots' it is important that the issue of standardization of the Urdu Code Plate and key board is immediately resolved. A focused effort to standardize the Urdu code plate will be done in the next few weeks and a concerted plan to encourage the development of open source and licensable Urdu software is being launched. 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.

We recognize that Pakistan has to leverage its knowledge base of an English literate population and the goal will be to keep on driving towards exploiting this asset. The development of the Urdu word processor, spreadsheet, database and presentation interface will in no way detract from encouraging the people to learn the English elements of the Office environment and Software use. In fact the government will actively encourage the use of Linux as a free operating system and a very low cost or free English language Office software for normal operations.

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.

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):

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

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

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.

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

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.

The IT Division shall promote and facilitate the local industry rather than get involved in competitive activities itself.

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.

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.

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 IT Support Councils 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.

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.

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.

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).

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

Fix yearly targets for software export and equip PASHA to perform its role effectively in export marketing. PASHA shall be the focal point for all software related export activities and it will work closely

with IT Division and other departments to ensure that export-marketing activities have a synergetic effect. Earmark adequate funds and provide infrastructure to promote software exports.

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

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

Establish an Export Market Development Fund to create a favourable market image of Pakistan's software industry. These funds should be used for participation in software and other IT related fairs, single country exhibitions, and investment seminars. IT Division/Export Promotion Bureau and PASHA will jointly manage this.

IT Division 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.

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

All Software companies (local or for export) will need to be registered with the IT division in order for them to be able to obtain the benefits give under this Policy.

Hardware Industry Development

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".

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

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are provided below, divided into two important categories: 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.

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.

The concessions incorporated in policy for the software industry shall be extended to the hardware industry. General recommendations for this industry are provided below, divided into two main categories: manufacturing and R&D.

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

Manufacturing

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

As far as possible, duties and taxes for hardware products shall be brought in line with WTO's Information Technology Agreement (ITA).

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.

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

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

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.

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

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

Technology Transfer and R&D

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

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 faculty chairs, matching grants and focused joint projects.

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.

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

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.

Establish a premier think-tank institute based on public and private sector partnership. It is suggested that this institute work in close collaboration with a similar set-up outside Pakistan and is close to a nucleus of R&D activity in this field.

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 Pakistan: existing regulatory structures should not be forced on it, competition in Internet growth should be encouraged and 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.

The Pakistan Internet Society is being 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.

The aspects that need to be considered in this regard are discussed below.

Internet Market Development

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.

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

To ensure that the Internet market develops:

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

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.

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.

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

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.

IP Delivery Mechanisms

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.

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.

Incentives

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. A detailed list of these incentives is also annexed. These recommendations will become operative after the necessary consents have been obtained from the relevant authorities e.g. State Bank of Pakistan, CBR, Banks, NIT, SECP, Export Promotion Bureau, Ministry of Finance, Customs Department, etc.

Fiscal Incentives

Declare information technology as 'Infrastructure Facility'. 'IT industry' to be redefined as a core business function to the level of production and to include provision of hardware, software, training / consultancy / education, telecommunications equipment, and allied products.

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.

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

At the center of development of the IT sector is the venture capital industry. The willingness of venture capital funds to incubate IT companies has been crucial for the IT industry. Frame proper regulations and incentives for encouraging venture capital investments and setting up private funds. This could be monitored and regulated through the establishment of an institutionalized venture capital industry association. A vibrant venture capital sector can leverage innovation, promote technology, and harness the ongoing knowledge explosion.

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Encourage equity participation of banks in software projects by setting up venture capital funds at the federal and provincial levels. Necessary changes in legislation are being carried out by the SECP (Securities and Exchange Commission of Pakistan).

Encourage banks, DFIs, and SMEDA to recognize software development as a priority industry. Major banks should have IT financing cells for smooth and transparent processing of loans and funding based on cash flows, future earnings, working capital financing, etc.

Set up Venture Capital Funds[2] 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. 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.

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.

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

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. A properly prioritized, funded and implemented national IT plan would attract such investors, especially if the government can institute a convincing regulatory environment and ensure continuity.

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.

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[2] A proposed draft notification for Venture Capital companies has been prepared and sent to the SECP

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.

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.

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

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

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

Establish an Export Market Development Fund, managed by IT Division/EPB, to provide marketing support to IT exporting companies, with matching grants from the government.

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

Redefine 'IT industry' to include provision of hardware, software, training/consultancy/education, telecommunications equipment, and allied products.

To facilitate the capital accumulation required for international marketing, give IT exporters a seven-year tax holiday.

For duty and tariff purposes of the IT industry, treat IT hardware, software, and related equipment (e.g., radio modems, routers, auto-teller machines [ATM], electronic components and consumables, power generators, air-conditioners, test equipment) as one category and exempt them from all duties, taxes, surcharges, octroi, etc.

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.

Ensure that all equipment/software tools being imported for IT exports are swiftly cleared.

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

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

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

IT companies must register with the IT Division to qualify for the above-mentioned exemption/concessions..

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:

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

Presence of IT specialists in embassies, commercial consulates, and EPB offices in countries with software export potential. Consultants may be hired for larger markets, like the United States.

Review of government policy to ensure that service providers can compete in the provision of telecommunications services to rural areas, where appropriate.

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.

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.

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

Organization of special events during this year, such as a National IT Conference cum computer exhibition in major cities, mobile computer

exhibitions, international conferences and exhibitions, IT competitions at various levels, and special programs on electronic media.

IT Usage

IT in Government

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.

One or two projects are being identified to provide for a practical model for other departments. For example, the operations of the S&T ministry (and departments associated with it) will be hosted on the Web so as to provide transparency of transactions for all to see.

The main features of such a program could include the following:

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.

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

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.

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.

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.

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 and should be outsourced to the private sector. Selection of networking operators for government projects will be done on a competitive basis and will not be restricted to PTCL/NTC only.

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.

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.

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—the 'information economy'—is emerging. In 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.

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.

Broad policy recommendations for the sector are:

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.

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.

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.

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.

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

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.

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

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 shall 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.

Establish high profile Electronic Commerce Council of Pakistan (ECCP), to govern all the electronic commerce (e-commerce) affairs in Pakistan.

Establish specialized work groups for planning and implementing 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. The groups should work in consultation with the government, businesses and EC organizations.

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

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

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.

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

Facilitate international trade through an e-commerce infrastructure

To encourage use of E-Commerce in government for procurement, promotion of trade, provision of information and trade related services.

Legislation and Regulations

Legislation

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

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

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

Computer Crimes Act

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.

Tele-Education Act

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

Multimedia Convergence Act

Electronic Government Act

Electronic Commerce Act

Protection of privacy, security, and confidentiality.

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

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

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.

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:

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

Make optimum use of existing investments in networks. Remove restrictions on voice transmittal, video telephony through Internet, intranet, or other data communication links.

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

Facilitate rapid deployment of infrastructure for promotion of IT services.

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

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

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.

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:

Easier sharing of data,

Easier sharing of skills,

Economic usage of resources, and

Improved product quality.

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.

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.

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.

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.

Ministry of Science & Technology

IT Policy and Action Plan

SECTION - V - ACTION PLAN

Government of Pakistan

August 2000

Progress to date (August 22, 2000)

While the Policy document is being put in place some concurrent actions are being taken. Some of the key items are as follows. Some of these are covered in more detail in the next section.

The cost of Internet bandwidth of PTCL was reduced up to 53%, which has led to reduction in Internet end user prices and improvement in quality of service for the Internet users.

Free Internet connections are being extended to public sector Universities under an agreement with the private sector ISPs and PTCL.

To facilitate the private sector IT and telecom industry and to enhance the investor's confidence in the Government, processing period for license applications in the deregulated sector by the PTA has been reduced to 7 days from several months.

In order to deliver efficient IT infrastructure, PTCL would now provide international bandwidth and Internet connectivity to the ISPs and other corporate customers within 4 to 8 weeks. Previously this connectivity used to take 4 to 12 months.

Training of thousands of blue collar IT workers for data entry and transcription services is being initiated and would be completed within 6 months.

As a first step towards Electronic Commerce, the State Bank of Pakistan (SBP) has allowed banks to open Internet Merchant Accounts within Pakistan. This was a major hindrance in start of E-commerce activities in the country.

To facilitate the software export industry, SBP has instructed banks to accept the contracts as collateral for the software exporters to qualify them for Export Refinance Scheme. Previously this was only permitted against letter of credits, which do not exist in the software export business.

Software exporting companies have been allowed to retain 25% of their export earnings in foreign exchange accounts. Hitherto, the software exporters did not have any such facility.

Internet delivery on Cable TV has been permitted which would result in substantial increase in the Internet usage.

The market is being opened up for the private sector participation in joint venture with PTCL in terms of tele-housing arrangements, voice over Internet, setting up international bandwidth gateways via satellite and cable.

Universal Access to the Internet even to non connected areas at the cost of a local call using the unique '131' Universal Internet Numbers of ISPs has been extended. This facility is not available in many advance countries.

Call Centers, which are an important potential source of foreign exchange earnings and employment creation, have been allowed to establish in the private sector.

The minimum tax of 0.5% on remittances from software exports has been waived off.

Computer networking and majority of IT equipment has been exempted from custom duties.

Draft IT Ordinance 2000 has been formulated to provide legal recognition to electronic transactions and digital signatures and has been circulated to the concerned Ministries for comments. The final Ordinance would be submitted for approval of the Cabinet within next 2 months.

Income tax holiday for the IT Training Institutions has been extended by another five years, i.e., 2005.

As a first step towards Electronic Governance, applications for recruitment of the IT & Telecom professionals are being received online on the new web site of MOST.

A high level committee has been constituted to work out the detailed proposals of increasing the Ph.D. allowance to Rs. 5,000.00 per month and propose a package of financial incentives for the researchers based on their productivity. The Committee would submit its report within two months for final approval of the Government.

Income tax on the salaries of professionals involved in full time teaching and research and development work in non-profit R&D Organizations and Universities would be charged @50% of the normal rate.

Action Plan for Year 2000-2001

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.

Establishment of IT & Telecommunications Division

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.

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.

National Scientific and Technological Research and Development Management Fund

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.

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.

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.

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.

Project Plan

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.

Human Resource Development

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:

Training of Blue Collar IT Workers

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.

Establishment of National Accreditation Council and Testing Service

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.

Scholarships and Qarz-e-Hasna Scheme

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.

Internet for Education

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.

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).

Faculty Training

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.

Establishment of Faculty Chairs

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.

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

Hiring of Faculty from Abroad

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.

Strengthening and Capacity Building at IT Institutes and Universities

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.

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.

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.

Computer Literacy of Government Officers

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 undergoing 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.

Computer Literacy for all University Graduates

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.

Training of Commercial Counselors

"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.

Telecommunications, Internet and Infrastructure

Universal Internet Access

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.

IT Parks

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.

IT Investment

Venture Capital Fund

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.

Micro Credit Facilities

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.

Participating in International Software Exhibitions/Shows

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.

Road Shows

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.

Electronic Commerce

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

E-Commerce Training

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

Trade Facilitation

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

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

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

Bench Marks and Performance Indicators

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.

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.

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

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

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

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

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

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

Total number of ISPs 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

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

Action Plan for FY 2001-02 and onwards

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.

Implementation of Action Plan

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.

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.

Topic-Wise Action Plan

The following are a series of recommendations of the different working groups. These are being currently (or will be) discussed and examined by the specific Departments and Ministries for implementation.

These do not constitute an approved list but a series of recommendations from the eleven groups. The elements, which have been processed, will be put on the revised versions of the Plan document. The updated plan document will carry new proposed incentives for processing by the Ministries concerned. Duplication of some points was unavoidable but will be streamlined in future versions.

Each item in the list below is being processed by working groups to come out with clear targets, costs and expected results, which should accrue from their implementation.

	EDUCATION, HR AND TRAINING
1	Implementation Body: An effective and professional implementation body is required to rapidly execute the various initiatives involving curriculum development, faculty chairs, visiting international faculty, teacher training, scholarships, testing, and infrastructure development.
2	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.
3	Establish Accreditation Council to ensure quality of IT education and training. 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.
4	Establish an Institutional Development Cell within the IT Division to manage the HRD fund. The cell will also mobilize financing for IT education and training through expatriate Pakistani community, international agencies such as UNIDO, Islamic Development Bank, World Bank, CIDA, and global IT firms such as Microsoft, IBM, Oracle, etc.
5	The Institutional Development Cell will take steps to strengthen existing IT training institutions and encourage setting up of new IT training institutes, update curricula, introduce new technologies through linkages with global IT firms, develop faculty and provide student scholarships. Teacher training shall be organized on top priority basis to meet the growing demand for qualified teachers in IT and for upgrading their skills regularly. An Institute of IT Professionals with the help of The Computer Society of Pakistan shall be established to provide accreditation to IT professionals
6	Establish an HRD fund (HRDF). This fund would 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, get 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. To rapidly increase the annual production of IT manpower crash training programs will be launched. The HRD fund would be utilized for supporting IT training activities.

7	Establish a National IT Testing Service, to be managed by the Accreditation Council.
8	Need to continuously monitor the performance of IT education and training by collecting data on (and placing these on websites): International benchmarks IT professionals (including salary survey) Educational Institutions Manpower Needs of Software Houses Corporate and Government use of IT
9	Standardized curricula following international standards need to be rapidly developed for all levels of IT education and training including Masters, Bachelors, Diploma, Intermediate, and Certificate (short courses).
10	Accreditation process to ensure quality of IT education.
11	Nation-wide test for scholarships and admissions. Also selected exit tests (by module) and professional certification
12	Develop standardized curriculum. This includes both medium tech (such as current technologies including Java, Oracle, etc) as well as low-tech (such as data entry).
13	Standardized Curriculum: Standardized curricula be developed. Students wishing to continue their studies could be given credit towards MS-CS degree.
14	The curriculum which was last revised in 1986 and continues to teach FORTRAN as the main programming language needs to be revised.
15	A standard curriculum could be recommended to all institutions having the charter to offer Bachelors degrees. Note that revision of university curricula is typically handled by the university syndicate and is guided by the University Grants Commission (UGC).
16	Standardized curricula incorporating current technologies.
17	Scholarship fund to enable under-employed youth to obtain retraining through short courses.
18	*Student Scholarships*: Scholarship fund to enable under-employed graduates to obtain retraining through the PGD program.
19	The high cost of BCS education (Rs. 50,000 plus per year in private

	institutions) prevents many able students to enter the IT profession. A national scholarship fund for BS students (at partner institutions) should be established. Scholarships would be given based on a nation-wide test (which could also gradually become a standard component of entry testing).
20	A scholarship scheme to encourage the best students to enroll in graduate education.
21	Provide internet and computing facilities through community IT Centers for school children and the general public.
22	Internet Access: Subsidized Internet access to all educational institutions
23	Pakistan Educational Intranet (PEI): Establish a wide-band intranet connecting all educational institutions (public and private). Establish centralized data warehouse containing teaching and research material in order that resources may be shared (through video-conferencing and distance learning).
24	Utilize the Pakistan Educational Intranet to share teaching material and faculty resources through distance learning.
25	Foreign universities should be given incentives to set-up distance learning or resident programs in Pakistan.
26	Allow administrative autonomy to IT departments in public universities to enable them to attract and retain qualified faculty and rapidly respond to changing requirements of the IT industry.
27	Administrative Autonomy: In order to execute the set of initiatives described above in public sector institutions it is imperative that IT education and training be taken out of traditional systems. For instance a special compensation system will need to be devised in order to attract and retain quality IT faculty in public sector institutions.
28	Teacher training to develop teachers for short courses.
29	Teacher Training: Teacher training to develop teachers for the PGD program
30	Teacher training needs to be arranged to retrain existing science teachers and fresh graduates.
31	Short refresher courses (5-10 days) in each of the core areas of the BS-CS and BS-CE curriculum. 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

32	Establish faculty chairs to attract and retain qualified IT faculty and to encourage faculty to focus in their area of specialization. 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.
33	Public universities will be encouraged to collaborate with the private sector for conducting training programs during vacations and when facilities are not in use.
34	Arrange for special awards to leading IT teachers, professionals, and students.
35	Build 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. Each institution would be required to send in detailed proposals, action plans and performance targets.
36	To immediately build up MS and PhD Programs (in the 15 partner institutions) obtain 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.
37	One hundred institutions (public and private) to be selected to offer quality Bachelors education in Computer Science (BS-CS) and Computer Engineering (BS-CE).
38	Build 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. This program would be aimed at re-training 2000 under-employed graduates
39	Establish IT labs (with required hardware and software) in selected public sector universities, colleges, and schools.
40	IT Labs be established at major private sector universities, colleges, and schools.
41	IT Labs be established at selected government training institutes.
42	Build the capacity of 200 government colleges to offer the Computer Science paper at the Intermediate level (FSc - ISc).
43	Develop capacity of selected educational institutions to introduce new technologies and provide training in skills needed by the market. Short

	courses will need to be developed to cater for data entry and other low-tech jobs.

44	Develop a marketing plan to promote Pakistan as a serious player in IT education. Arrange for
	
	        Web site to assist IT graduates get local and international jobs
	
	        Market Pakistani IT graduates in selected markets (Australia, Malaysia, Germany, etc.)
	
	Arrange for Pakistan pavilion in educational exhibitions

45	Extra efforts will be made for the training of people with special needs in order to give them equal opportunity in society. Copies of special text to speech software will be obtained for schools for people with special needs
46	Special efforts will be made to educate, train and induct women in the IT sector.
47	Extraordinary efforts will be made to induct special software and hardware to enable the use of computers and the internet by visually and aurally handicapped people.
48	The matriculation curriculum for high schools shall have Computer Literacy as a compulsory module. Proficiency in use of IT shall be made a compulsory component of all degree courses within the next 3 years.
49	The top management of Pakistan and all key figures who can influence public opinion shall consciously propagate the use of IT in all public and private forums.
50	Special events shall be chalked out during this year such as National IT Conference cum Computer Exhibition in major cities, Mobile Computer Exhibition, International Conference and Exhibitions, IT competitions at various levels, Special programs on electronic media, etc.
51	High profile 'forced' awareness seminars shall be conducted for politicians and top Government policy makers all over the country in order to galvanize them to promote IT at all levels.
52	A special effort will be launched in collaboration with the local Chambers of Commerce to encourage the use of IT in the private sector.
53	Mandatory IT literacy courses for all levels of civil and military personnel. Make IT literacy a pre-requisite for induction into gazetted positions.

54	Encourage R&D in IT through close interaction between universities, government and private sector.
	TELECOMMUNICATIONS & INTERNET
55	A detailed Telecom Policy and Plan is under preparation. This should be issued in the next 60 days.
56	PISOC (Pakistan Internet Society) to be formed in the next 30 days to enable the proper implementation and growth of Internet.
57	The charges for licenses, royalties and other payments to PTA to be rationalized to reflect 'cost of regulation'.
58	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. Both of these proposals to be implemented in the next 60 days.
59	To ensure that decisions made for the growth and spread of internet viz. provisioning of bandwidth in 4 weeks of order pricing, provisioning of educational internet and other quality of service issues, domestic bandwidth pricing reduction, a monitoring task force is being created in the Ministry of Science and Technology and will start functioning immediately. The task force comprises of PTCL, ISPs, PASHA, MoS&T representatives.
60	Permission to operate Internet on Cable TV will be given in the next 4 weeks.
	FISCAL ISSUES AND INCENTIVES
61	In order to encourage listing of IT Entities that are usually small and have a small capital base, the capitalization limit should be reduced to Rs. 3 million. The SEC will frame appropriate legislation before the end of June 2000 to enable this to happen.
62	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.
63	Duties/Taxes for hardware products shall be based on the implementation of World Trade Organization's (WTO) Information Technology Agreement (ITA).

64	Material, components and parts required for production/manufacturing of item/equipments related to and used for Information Technology and Telecommunication should be exempted from import duties and taxes. The I.T & Telecom Division shall prepare list of such items in consultation with CBR.
65	In order to provide protection to the existence manufacturer and electronics industry prevalent custom duties may be reduced in stages over a period of three years. Presently on some telecomm equipment 35% duty is chargeable. This may be reduced to 25%.
66	Customs duties on ready equipment required for IT and Telecomm (as not being locally manufactured) should be exempt from all import duties and taxes. Eligibility of such exemption may be subject to inclusion of items in the list as prepared and updated from time to time by IT and Telecomm Division.
67	All types of dedicated capital investment items, approved by IT & Telecom Division, to be used by the IT & Telecom Manufacturing Industry should be Duty/Tax free.
68	Some organizations like Armed Forces are allowed to import equipment on reduced/zero duties. However, when a local manufacture manufactures a product for such organization, has to pay duty on raw materials and Semi-finished Goods. Thus the local manufacturer cannot compete with imports. In such cases he may be given similar custom concession for custom authorities can lay down checks to ensure that such imports are used for making products for Armed Forces.
69	The facility contained in item (86A) of part I of the Second Schedule to Income Tax ordinance regarding tax exemption for newly set up educational institutions may be extended to such units set up between 1-7-2000 and 31-6-2005.
70	The central excise duty on the leased lines (other than voice services) to be waived.
71	Utility bills for educational institution should be charged at residential rates.
72	The business income of concerns in IT Industry, whose definition is given below, is liable to tax. If a five (5) years tax holiday is given the industry will flourish for two reasons: The tax liability will be nil. The cost of maintenance of detailed record and legal fees will be

	drastically reduced.
	OR
	If for any reason tax holiday cannot be granted a substantial reduction in tax liability may be given as under:
	25% rebate may be given while calculating tax liability of limited companies, and
	The initial monetary threshold for sole proprietor IT professionals be raised from Rs.40,000 to Rs.200,000.
	Definition of IT Industry: For this clause IT Industry includes infrastructure providers, Internet/Application Service Providers, IT educational institutions, Data Entry.
73	At present remittances from software export are exempt from income tax; but 0.5% minimum tax is levied. This liability may be waived. Secondly, such total exemption facility may be extended to sales of domestically developed software.
74	The sales and import of products/services of IT Industry, as defined below may be exempted from sales tax levy. Definition of IT Industry: For this clause IT industry includes IT equipment manufacturers, software developers, infrastructure providers, Internet/Application, service providers, IT educational institutions, Data entry
75	100% depreciation may be allowed on all assets of an IT Company or professional. This will encourage investment and plugging back of business profits. This has only deferral effect; there is no loss of revenue.
76	Turnover Tax @ 0.5% on Gross Revenue may be specifically waived for IT companies.
77	Exemption from duties, taxes, surcharges on all computer related hardware, peripherals, and telemetric infrastructure being used exclusively for software exports. All equipment imported for providing IT services (whether local or exports) be totally exempt from all duties, sales tax, and charges. Ministry of Science and Technology should prepare the list of equipment to be classified as such, as updated from time to time. Furthermore, if exemptions are not made available then concessions be allowed
78	Removal of Central Excise Duty of on leased lines both domestic and international.
79	Payment made to foreign carriers for international bandwidth is subjected to withholding tax of 30% of gross payments. This in on

	account of the fact that definition of royalty' and 'technical fees' mentioned in the Ordinance also includes such payments. The international bandwidth charges do not result in huge gross profit rate like royalties. Therefore, the foreign carriers add this 30% in the bill. This increases upfront cost. It will be reasonable if these types of payments are subjected to 5% to withholding tax. But the US based companies enjoy total tax exemption on such income. It is, therefore, proposed that type of income may be exempted from tax.
80	The computer-related associations like Computer Society of Pakistan (CSP), Pakistan Software Houses Association (PASHA), ISPAK (Internet service provider of Pakistan), Pakistan IT Hardware Manufacturers Association (PITHMA) may be exempted from Income Tax.
81	Similarly, to retain qualified faculty within the country, all M.Sc and PhD Degree holders should be exempt from income tax, wealth tax and withholding tax as long as they remain employed in recognized IT Education & Training institutes.
82	No value added taxes, sales taxes, excise duties, local taxes should be applied on raw materials whether local or imported and for finished goods, whether these items are exported or sold in the local market to ensure attractive selling prices.
83	The National Investment Trust be directed to put up at least 20% of the public offer of the Telecom and IT companies.
84	The Nationalized Banks, Other Banks, Investment Funds should be directed to create an Underwriting Fund so that public offers of IT companies can arrange a portions of their capital to be underwritten.
85	Special listing procedures for IT companies, removing a minimum part of 25 percent to the public.
86	Corporate and legal framework be formulated to allow formation of foreign companies including investments therein from Pakistan for international marketing of IT services.
87	Employees Stock Option Plan ("ESOP") be encouraged by speedy implementation of laws and relevant rules where employees are made part of the equity holders of the IT and Telecom companies.
88	The stock option given to employees in lieu of their remuneration may be exempted from income tax and wealth tax. The SECP Regulations and laws will reflect this accordingly.
89	Special guidelines must be framed in collaboration with finance ministry

	in order to meet working capital needs of the IT sector. This can be based on Receivables and Future Earning Securitization etc. Evaluation criteria for such financing could be track record of entrepreneur, management team, professional qualifications and work experience in IT industry. Existing prudential regulations must be relaxed.
90	Loans at special rates of interest should be available similar to that given to local manufacturing industry (LMM loans). State Bank of Pakistan can formulate a policy with immediate relief to the IT sector
91	Leasing Companies must be allowed in general to provide capital as well as operating leases to IT companies.
92	Earnings must be allowed to be kept in US$ in local <u>banks</u>
93	Presently Export Refinance for export of software is available at 8% p.a. with a maximum drawing limit of 50% of last year's exports. The export refinance facility should be available to finance at least 80% of the export contracts available during the next one year. In the first year the performance requirement against such refinance should not be greater than 1 times which may be increased to 2 times in the subsequent year.
94	Local manufactures of Telecom and IT related equipment and companies engaged in the development of telecom infrastructure be financed through loans having cheaper interest rates in order for them to be competitive with the grown up international industry.
95	Commercial I Investment banks be given special tax concessions related to earnings from investments in IT ventures.
96	The GoP introduce special Schemes to provide international marketing funds to the software companies in the form of grant. In this regard, a Software Export Market Development Fund to be set up by the GoP. Funding through EPB using fund allocation.
97	Micro Credit may 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.
98	Rural Support Programs and Micro Credit Bank to be encouraged to play a role in this area.
99	Datacom/ISP provide the backbone to software producers and exporters. At present, significant costs and charges are required to be paid by Datacom/ISP companies to PTA. The charges include License Fee of RS. 500,000/- an annual renewal fee @ 20% of the initial license fee. There is royalty payable to PTA equal to 4% of Gross Revenue or 50% of license fee (which ever is the higher). These punitive charges

	should be removed. The Licence and renewal fees to be brought down to zero.
100	Bandwidth both domestic and international works as the backbone of the Datacom/ISP companies. It is imperative that Bandwidth prices are reduced substantially and in a short time.
101	Unlisted IT companies may be given the status of Public Companies for tax purposes (the applicable tax rate will be reduced from 43% to 33%)
102	Both Input and Output software must be classified as receiving the same tax incentives as other equipment.
103	All infrastructure equipment required for setting up IT Parks, Testing Laboratories Equipment and Plant & Machinery required for manufacture, testing and maintenance of equipment in IT and Telecommunications should be exempt from taxes.
104	In order to promote the use of IT in government, 5% of each department's annual budget will be exclusively allocated to acquisition and implementation of IT and related services. To create the same impact in the private sector, it is proposed that a maximum of 25% of the pre-tax profit of the company may be allowed to be re-invested in IT, in return for which the amount so spent will be exempt form taxation. This provision may be made effective for a period of 3 years.
105	The government will set up a venture capital fund with a minimum capital of Rs. 1 billion. This fund is to be channeled initially into existing IT companies to boost their export marketing capability and software development effort.
106	All state owned banks and financial institutions would be directed to set up separate divisions for funding IT ventures. More specifically, these banks will be directed to develop adequate capability to value intellectual property and accept such property as collateral for the purpose of extending soft term loans, whose interest/mark up should not exceed 8%.
107	A clarification shall be issued by CBR that Service Tax is not applicable on computer software development industry
108	IT Software and IT Services shall be exempted from withholding tax.
109	For individuals buying IT products, including computers and locally developed software, the documented expenditure shall be reduced from taxable income.
110	No Gift tax shall be charged for the giver, or Income Tax for the

	receiver for purchase of PCs up to a value of Rs 50,000 of purchase price.
111	Amount given by a taxpayer to the R & D Institutions/Universities, approved by IT and Telecom Division, for product development research work shall be allowed as an expenditure deductible from annual income of that taxpayer
112	The banks shall be allowed to invest in the form of equity in dedicated venture capital funds meant for IT industry.
113	Venture Capital companies may be allowed to setoff off losses in one invested IT Entity against profit in another invested company for the purpose of income tax
114	For promoting Pakistani software products and services, users will be given special incentives to "Buy Pakistani". The government and its departments will consider non-Pakistani software, consultancy and services only when unavoidable, and that too under the condition that the overseas supplier takes a Pakistani partner.
115	Parts/Components needed for the industry shall be charged zero duty and zero tax and shall be at par with the finished goods.
116	Locally produced IT Hardware should be exempt from PTA Royalty.
	LEGAL
117	Labor laws shall be reviewed and modified so that they do not become a disincentive for the industry. These will not fall in the purview of Inspectors for this purpose (Excise, Labour, Environment, Health etc).
118	Strict implementation of regulations/policies has to be ensured. Heavy penalties should be applicable to act as a true deterrent.
119	IT Software and IT Services companies, being constituents of the knowledge industry, shall be exempted from inspection by inspectors like those for Excise, Labour, EOBI, Pollution/Environment etc.,
120	An Ordinance be promulgated to modify the laws of Pakistan to provide for the legal recognition of the electronic signatures and electronic records.
121	Cyber Regulations Appellate Tribunal be set up and procedures put in place for electronic authentication and verification.
122	To protect and promote E-Commerce, a law be promulgated within six months requiring compulsory creation, retention of electronic records and computerization of the various processes involved in connection

	with E-Commerce.
123	The Bill pending before the Senate be passed with requisite modifications as an Ordinance providing intellectual proprietary right over software.
124	The proposed fiscal incentives be reviewed within 30 days by the Central Board of Revenue with a requirement that the recommendations shall be treated as acceptable to CBR unless detailed reasons duly highlighting the adverse fiscal implications are received by the IT Commission.
125	In view of the global trend of convergence of telecommunications and multimedia, the Pakistan Telecommunications (Re-Organization) Act – 1996, be amended to restructure Pakistan Telecommunication Authority as Pakistan Multimedia Authority with the joint responsibility of regulating the telecommunication sector and the multimedia systems in Pakistan. The requisite legislation should aim at de-regulation.
126	PTCL and NTC should be immediately required to invest in multimedia/IT infrastructure on a joint venture basis rather than by creation of duplicate systems.
127	Appropriate laws be passed within a short time, requiring each school, college, university, technical colleges and other educational or vocational training institutions to have at least one period every week dedicated to the teaching of computer awareness, internet and it's practical implications. The courses to be taught in these classes (from Class IV to post-graduate level) be developed by representatives of ISPAK and PASHA and foreseen Accreditation Council
	HW & SW INDUSTRY
128	IT software will be free of all duties and taxes.
129	The incentives currently available to the software exporting organizations are due to end in year 2003. Since the objectives of these incentives have not been achieved due to other factors, it is essential to extend the incentives up to year 2010. Further, these incentives and concessions should be applicable to all IT Entities, not just software exporting companies.
130	IT companies must register with IT commission to qualify for all exemption / concessions provided to the industry
131	The taxation regime for the industry will be modified to ensure that complications as service tax, tax on profits relating to domestic turnover, withholding tax, etc are reviewed.

132	The Securities and Exchanges Commission of Pakistan will modify the necessary regulations to ensure the workability of various new operating elements like Venture Capital funding, sweat equity, premium on public offerings, etc.
133	A Hardware Development Fund (HDF) shall be established to fund IT related R&D and manufacturing activities. The disbursement of this fund can be modeled on DoD's SBIR, STTR and Fast Track Programs, with appropriate modifications.
134	All public-sector manufacturing and R&D setups should be encouraged to handle private-sector business. Budgets allocated to these units should be tied with the private business handled.
135	Wherever possible, local assembly of hardware parts/sub-assemblies/products shall be encouraged not by restricting imports but by encouraging the local industry through incentives.
136	All SROs relating to the hardware industry (as with software industry) need to be modified to meet the new requirements. This should coincide with the definition and the scope of the hardware industry. Legal cover be given where necessary.
137	If a hardware product is being produced locally, the private/public sector consumer should be encouraged to ensure 50% of the relevant project value content to local manufacturer.
138	If a substantial amount of a particular hardware is being procured from international sources, the customer in the public/private sector should be encouraged to ensure technology transfer with at least 20% local value addition, through local manufacturing of the product under license in an existing production setup.
139	Depth of production needs to be enhanced, in a step-wise fashion, to increase value addition and become competitive with international market. This requires upgrading support industries and producing primary components. FDI should be encouraged in this area.
140	Viability of local production of key IT products (e.g. personal computers, modems) with typically low value-addition and low margins needs to be carefully evaluated, with the intent to find ways and means of entering such markets.
141	Low-tech areas where our lower labour cost is advantageous and where patent rights are not violated and no royalties are payable should be concentrated on.

142	Management control of existing manufacturing concerns in the public sector should be transferred to private sector through equity participation or long-term lease.
143	Encourage FDIs to setup manufacturing/assembly facilities for hardware. Emphasis should be on primary components. Modify rules restricting minimum investment, equity participation, remittances etc.
144	Technology Parks shall also be allowed to be used for local IT Hardware Industry.
145	Software exporting companies and hardware manufacturing units with verifiable export/import substitution in location other than Technology Parks(TP) should be declared EPUs(Export Processing Unit).
146	A syndicate of IT hardware manufacturers needs to be established to act as a unified interface point.
147	In order to develop, understand & interpret the IT policy, efforts be made to develop understanding of IT related issues by government officials specifically those related to taxation
148	For many software houses, lack of adequate funding affects their marketing effort. This is especially true for overseas marketing which requires a substantial investment. In order to encourage establishment of new software houses and support the existing ones, Pakistan should unleash a **marketing blitz** and participate in at least ten (10) software shows during the next twelve (12) months and undertake a minimum of five (5) Road Shows. It will be necessary to allocate around US$ 3 million for this purpose but the potential return is extremely high. The guidelines will be as follows: **Participating in International Software Exhibitions/Shows** 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 each instance). Software houses will bear their own cost of travel, accommodation, marketing material, etc. PASHA/ITC will identify the shows in which to participate Commercial Attaché's will be asked to liaise with PASHA/ITC to identify prospects, attract them to the show and follow up subsequently PASHA/ ITC will select the participating software houses according to set guidelines (e.g., preference to those having over

	Rs. 5 Million of total declared revenue during past 12 months, of which at least $ 30,000 should be declared exports) PASHA/ ITC will set minimum standards that participating software houses must maintain during the show (e.g. number of products to display, number of presenters to be at hand, etc.) **Road Shows:** One Road Show each should 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.
149	The government should place attractive ads in internationally renowned magazines and newspapers. These would highlight available skills and direct potential customers to web sites for further details. PASHA/ ITC to prepare advertisements.
	E-COMMERCE
150	**Pilot Projects:** EPB, SBP, IBA and Customs should be made responsible to achieve the following with in 3-12 months. It is proposed that the Government should share Rs. 10m and the Private sector Rs. 5m of the estimated cost expenditure. Facilitate exports through electronic exchange of a subset of export related documents between stakeholders (SBP, Customs, Shippers, Exporters) Online B2C shopping, B2B Local Exchanges for Supply Chain Management and logistics Consensus among Customs, SBP, EPB and traders Necessary regulations Internet merchant accounts/EFT
151	**Awareness and Propagation:** Media, IBA and CSP should be made responsible to achieve the following with in 3-12 months. It is proposed that the Government should share Rs. 30m (Reaching 50K + persons/organization) and the Private sector Rs. 40m of the estimated cost expenditure.

	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
152	**E-Commerce Training:** Certified E-Commerce Institutes should be made responsible to achieve the following with in 3-24 months. It is proposed that the Government should share Rs. 20m @ Rs. 10K per person and the Private sector Rs. 30m of the estimated cost expenditure.
	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
153	**Trade Facilitation:** EPB, CBR/PRAL and SBP should be made responsible to achieve the following with in 3-12 months. It is proposed that the Government should share Rs. 10m and the Private sector Rs. 15m of the estimated cost expenditure.
	Design of electronic forms, redesign of reporting and approval procedures for bill of Entry/Exports, I/E forms, registrations etc.
	Involvement of key government stakeholders: SBP, EPB, Customs, CBR, CAA, Port Authorities, PTA, Law ministry and other private sector stakeholders
	Obtain consensus of the stakeholders
	Commitment of time resources of decision makers
	Legislation/regulation for e-commerce documents, procedures and payments
153	**Setup EFT Network:** SBP should be made responsible to achieve the following. It is proposed that the Government should share Rs. 140m

		for SBP/Government electronic links with all the banks and the Private sector Rs. 1.5bn (Rs. 1.5m per node) of the estimated cost expenditure.
		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
154		**Establish Infrastructure for Research on Emerging Trends and Technologies:** IT Division of MoST should be made responsible to achieve the following in 3-12 months. It is proposed that the Government should share Rs. 140m and the Private sector Rs. 410m of the estimated cost expenditure.
		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
		Change management, monitoring, supervision
		Obtain membership of AFACT
		Participation in International Trade Facilitation Networks

Points Already Forwarded to Ministry of Finance

The following points are being discussed with the MoF as well as other Divisions and Entities. Some of these have already been addressed in the Budget for the FY 2000-2001. The remaining points will be discussed (alongwith other points in the Recommendations) in the next few weeks with the relevant Ministries and Divisions.

Income Tax

The business income of concerns in IT Industry, whose definition is given below, is liable to tax. If a five (5) years tax holiday is given the industry will flourish for two reasons:

The tax liability will be nil.

The cost of maintenance of detailed record and legal fees will be drastically reduced.

OR

If for any reason tax holiday cannot be granted a substantial reduction in tax liability may be given as under:

25% rebate may be given while calculating tax liability of limited companies, and

Exemption from payment of income tax to faculty members holding M.Sc. and Ph.D. degrees.

In order to encourage expatriate faculty the foreign IT professors may be exempted from income tax provided the country of residence of the professor gives credit for tax waived either through matching tax credit or by total exemption in the home country on income earned in Pakistan.

The stock option given to employees in lieu of their remuneration may be exempted from income tax and wealth tax.

Payment made to foreign carriers for international bandwidth is subjected to withholding tax of 30% of gross payments. This in on account of the fact that definition of royalty' and 'technical fees' mentioned in

the Ordinance also includes such payments. The international bandwidth charges do not result in huge gross profit rate like royalties. Therefore, the foreign carriers add this 30% in the bill. This increases upfront cost. It will be reasonable if these types of payments are subjected to 5% to withholding tax. But the US based companies enjoy total tax exemption on such income. It is, therefore, proposed that type of income may be exempted from tax.

The computer-related associations like Computer Society of Pakistan (CSP), Pakistan Software Houses Association (PASHA), ISPAK (Internet service provider of Pakistan) may be exempted from Income Tax.

Amount given by a taxpayer to the R & D Institutions/ Universities, approved by IT and Telecom Division, for product development and research work shall be allowed as an expenditure deductible from annual income of that taxpayer.

Customs Duties

Material, components and parts required for production/manufacturing of item/equipments related to and used for Information Technology and Telecommunication should be exempted from import duties and taxes. The I.T & Telecom Division shall prepare list of such items in consultation with CBR.

In order to provide protection to the existence manufacturer and electronics industry prevalent custom duties may be reduced in stages over a period of three years. Presently on some telecomm equipment 35% duty is chargeable. This may be reduced to 25%.

Customs duties on ready equipment required for IT and Telecomm (as not being locally manufactured) should be exempt from all import duties and taxes. Eligibility of such exemption may be subject to inclusion of items in the list as prepared and updated from time to time by IT and Telecomm Division.

All types of dedicated capital investment items, approved by IT & Telecom Division, to be used by the IT & Telecom Manufacturing Industry should be Duty/Tax free.

Software exporting companies in location other than Technology Parks(TP) should be declared EPUs(Export Processing Unit).

To be eligible for availing the facilities of a TP/EPU the software company should have a minimum export obligation verifiable through the State Bank of Pakistan.

Some Organization like Armed Forces are allowed to import equipment on reduced/zero duties. However, when a local manufacture manufactures a product for such organization, has to pay duty on raw materials and Semi-finished Goods. Thus the local manufacturer cannot compete with imports. In such cases he may be given similar custom concession for custom authorities can lay down checks to ensure that such imports are used for making products for Armed Forces.

Central Excise

The central excise duty on the leased lines (other than voice services) may be waived.

Sales Tax

The sales and import of products/services of IT Industry, as defined below may be exempted from sales tax levy.

Definition of IT Industry: For this clause IT industry includes IT equipment manufacturers, software developers, infrastructure providers, Internet/Application service providers, IT educational institutions, Data entry.

Miscellaneous Incentives

The electricity and gas being supplied to IT institutions, approved by IT and Telecom Division, be charged at "residential consumers" rate to reduce cost of such institutions.

Financial Incentives

In order to encourage listing of IT Entities that are usually small and have a small capital base, the capitalization limit should be reduced to Rs.3 million. The SEC will frame appropriate legislation before the end of June 2000 to enable this to happen.

The government will set up a venture capital fund. This fund is to be channelled initially into existing IT companies to boost their export marketing capability and software development effort. A committee comprising IT & Telecom Division, Ministry of

Finance and State Bank of Pakistan will administer this fund independently.

All state owned banks and financial institutions would be directed to set up separate divisions for funding IT ventures. More specifically, these banks will be directed to develop adequate capability to value intellectual property and accept such property as collateral for the purpose of extending soft term loans, whose interest/mark up should not exceed export re-financing rate.

The bank shall be allowed to invest in the form of equity in dedicated venture capital funds meant for IT industry.

Loans to approved IT educational institutes for the purpose of construction of buildings, purchase of computers, furnitures, generators, air-conditioners may be given at soft terms.

Institutional arrangement may be made by State Bank of Pakistan for low interest rate loans to students at IT institutes.

Points Already Forwarded to State Bank of Pakistan

S #	Agenda Item	SBP Support Required	Target Date
1.	Internet Merchant Account	Circular to be issued by SBP Regulations to be amended.	June 2000
2	Enable Inter-bank electronic funds transfer	All banks to start inter-bank EFT.	June 2000
		SWIFT access point.	Jul 2000
		ECH to be established	August 2000
3	E-Commerce Network	Process re-engineering of SBP foreign trade sections E/I/other forms to be computerized	July 2000
		Electronic E/I forms to be used	August 2000
5.	Immediately do-able	Circular for electronic e-forms for <$500 value orders through Internet	June 2000
		E-commerce wing at all financial institutions	
		Daily Electronic inter-bank clearing	
		Electronic reporting by all banks	
		Daily on-line electronic reporting by Money exchangers through TCP/IP	
6	Bodies to be set-up	Pakistan Payment clearing Association (by commercial banks)	June 2000
		PakEFT (Third Party solution provider for EFT)	
		Separate networks/associations for DFIs, NBFIs, Money Exchangers and other financial institutions, linked online to the PakEFT	

The Next Steps

The National Information Technology Policy and Action Plan Recommendations represent the culmination of initial efforts at articulating the needs of the IT sector. In order to translate these recommendations into workable policy and action plan elements, additional steps need to be undertaken, albeit on an expedited basis, for putting in place all the components that had been missing in previous similar attempts. Such an exercise at laying the groundwork for sound policy formulation and implementation would necessarily entail additional time. Nevertheless, it is essential that the initial momentum and goodwill gained by the government in initiating the process is not lost due to extensive planning and approval procedures.

For this purpose, a two-pronged phased approach is being followed:

Identification and immediate implementation of a short-term action plan (STAP) from amongst the action items already received, lasting for at least one year, that can help remove some of the existing barriers to IT usage and facilitate growth; and

Institute a well-defined process whereby a consistent and regular update mechanism is established for the National IT Policy and Action Plan. Formulate implementation arrangements that are designed and established with appropriate administration support. Effective management of which would encourage capacity building that would support a vibrant IT sector. This process will help define a more stable and detailed longer-term strategy. Following a systematic and phased process.

Both processes will be initiated concurrently so as to expedite results and ensure overall synergy and continuity. Together, the STAP and the National IT Policy and Action Plan will help kick in immediate improvements and incentives for the IT sector to stimulate public and business interest and remove existing bottlenecks, while simultaneously ensuring that a thorough and well endowed policy and plan that can sustain growth over the longer term is not sacrificed at the altar of expediency, as had been the practice in the past. The STAP will also provide a mechanism for obtaining valuable feedback on the impact of specific reforms and incentives, as well as for testing initiatives on a pilot scale before they can be adopted for full-scale implementation in the National Action Plan.

Short Term Action Plan (STAP) for the IT Sector

Over the course of the previous deliberations on the IT sector in Pakistan, numerous policy, regulatory, tariff, and operational impediments to the widespread adoption of an IT culture by all sectors of Pakistani society have been identified and ready solutions suggested for removing such bottlenecks and barriers. There is broad consensus on a number of such issues, and only appropriate action is required to address such problems and immediate needs of the industry.

STAP Formulation

The STAP as mentioned is initially being drafted from suitable recommendations contained in this document, subject to the selection criteria described below. The draft STAP will be made available on the Web and suggestions will be sought for further improvements from the general public and IT community through an appropriate media campaign.

The Working Groups constituted for the preparation of the National IT Policy and Action Plan (see further), comprising of suitable industry, academia, government and consulting specialists will be responsible for compiling, modifying and incorporating changes to the STAP document over the course of its lifetime, as well as for monitoring follow up action and industry response and feedback.

The experience gained from the management of the STAP process will be directly useful in updating the National IT Policy and Action Plan. The latter will also ensure the proper continuation of the actions initiated under the STAP, as well as incorporate elements that, for various reasons, could not be successfully implemented during the STAP period.

STAP Criteria

The actions being included in the STAP would be required to meet a minimum set of criteria described below. This will ensure consistency in the implementation requirements for specific STAP elements, ensure quick results, and prevent wastage of resources on more complex issues with longer term implications that would be better addressed on detailed reviews and understanding of an action implications for sustainability.

The basic criteria applicable to all STAP elements would include the following:

A maximum limit of one-year from the date of initial STAP approval for the implementation of the recommended measures. For one-off measures (e.g., tariff or tax adjustment), final implementation must be obtainable within this period, while for continuing actions (e.g., provision of

venture capital), their immediate objectives and operation must be realizable within this period.

Actions must be achievable at low- or no-cost. Examples include changes in IT regulations and legislation or removal of other artificial constraints to IT activities. When evaluating costs, losses in direct GoP revenues will be discounted, but overall economic costs should be considered to the extent possible. This 'no regrets' approach will ensure that excessive investment is not undertaken without a proper assessment of returns and opportunity costs, but actions which are justifiable even in the absence of specific IT goals can be undertaken promptly based purely on their intrinsic merit and overall benefits.

Actions and their implications must be reversible, if required, and not carry permanent long-term implications. This would ensure that resources are not wasted on initiatives that a more thorough assessment could find unnecessary or counterproductive, nor lock the country on to high-cost options from which it may become difficult to depart. Again, many policy measures, by virtue of being amenable to revision, would qualify but care must be taken that frequent policy changes can also carry a significant hidden costs. Virtually all barrier removal exercises, however, would be suitable candidates for the STAP.

Actions must be sustainable in the longer term. Decisions must not be taken on a one-year performance basis, but must consider how desired objectives can continue to be met in the future. Even low-cost investment decisions must not be made without evaluating recurring operational, management, and replacement costs for the future. Policy measures must similarly be in line with the perceived long-term interests of the country and not subject to substantial revision later.

Activities must initially focus on barrier removal and IT facilitation, The emphasis in the STAP should be on how existing resources, infrastructure, and IT talent can better be utilized in moving the industry forward, creating greater public awareness, and improving the efficiency of IT-based service provision.

The National Information Infrastructure

The NII comprises of not only the Physical infrastructure but also all the associated parts including legislation, HR development, etc. This is a core development area and its details are addressed separately in each section.

National IT Policy and Action Plan

The steps required to move the IT sector in Pakistan forward in a systematic, sustainable manner over the next decade of rapid anticipated technological and cultural change require a clear recognition of four essential facts as a prerequisite:

This is a large, continuous, and complex effort that requires deliberate, broad based, and conscientious actions, taking full cognizance of the material and intellectual inputs required to sustain and manage the initiative, and an equally strong aversion to the traditional norms of arbitrary and discretionary decision-making, grossly inadequate execution commitment and resource allocation, and the complete neglect of effective monitoring and evaluation. The old, familiar approach of planning by trial and error simply won't work in a fiercely competitive and technologically sophisticated global economy.

These changes, in some respects, run completely counter to widely held administrative attitudes, the existing national planning and management capability, and personal and institutional vested interests. Therefore, any attempt to launch a serious IT initiative in Pakistan must simultaneously resolve on how to address these inherent obstacles and gradually remove them so that the longevity of the reform process can be ensured.

The administrative reforms necessary must be accompanied by a concerted attempt to improve the capacity of the government-academia-private sector partnership by evolving mechanisms to obtain significant contributions from experienced IT professionals, both within the country and abroad and widen the discussion, debate and feedback on specific actions planned before they are adopted for execution. This involvement cannot be entirely voluntary, and resources must be mobilized to contract specific, meaningful technical and management inputs, as required. Such professional support must also be assured throughout the implementation and evaluation of actual action plan tasks.

The dependence of IT growth as well as its impacts on all other economic, development, and social sectors must be clearly understood at all levels of national planning. IT development cannot proceed at an optimal rate if Pakistan's educational system, including basic schooling, remains woefully inadequate and flawed;

If large segments of the population have little or no access to computers and the Internet;

If public service and consumer-oriented institutions, such as the judiciary, police, utilities, banks, transportation, social security, municipalities, libraries, and revenue collection agencies remain ignorant of the potential efficiencies, reach and benefits of large-scale adaptation of IT-based service management and delivery;

If the productivity enhancements and cost savings afforded by IT to the manufacturing industry remain unrealized;

If investment policies and incentives do not specifically focus on expanding domestic IT hardware assembly and manufacturing to drive down costs to the local user;

If information content and broadcast channels remain under tight state control and censorship and

If freedom of access to ostensibly public domain information is routinely denied to the common citizen; if major new investments in communications and commercial infrastructure are not promptly made;

If national quality and service standards are not defined; and

If the legal and regulatory system continues to obstruct instead of promoting fast IT growth.

Improvements in all of these and other areas must be undertaken independently of and simultaneously with the more narrow focus on a national IT-specific program initiative if the latter is to make any appreciable difference in the way Pakistanis view and employ information technology in their daily lives at home and at work.

Assuming that a broad awareness, if not acceptance, of these factors can be brought about amongst all levels of administration, **the country must adopt an expedited but phased approach to the issue**, realizing that the transition to an IT culture is necessarily a gradual process, and that while policies can be formulated by diktat, their implementation goals cannot be met similarly.

The National IT Policy and Action Plan will constitute the basic template on which all future government, private, academic, and investor activities in the information technology and related fields will be based. As such, the policy and plan need to be comprehensive in scope, specific in detail and flexible in approach so that the rapid evolutionary progress of information technology and its management requirements can be responded to efficiently and the country does not fall out of step with global progress. While maintaining flexibility, it must nonetheless be ensured that a sound, stable policy framework is provided so that business planning and investor

confidence is not harmed by frequent ad hoc changes and the credibility of the government to honour its commitments is not undermined. In this attempt in formulating this **initial National IT Policy and Action Plan is conceptually well thought out, comprehensive and practical, so that later modifications do not result in significant strategic shifts but are only confined to detailed refinements and enhancements of original policies.**

A sequential approach will be adopted in evolving and implementing an effective, dynamic and responsive National IT Policy and Action Plan. The main components of this approach consist of the following stages:

Undertake Core Planning

Through official notification, a group of four to six professionals will be formed to undertake preparatory activities in the absence of a suitable capability in the IT Division of MoST. The IT Commission will act as a steering committee for the core planning exercise. This group or organization will, over a period of 30 days, carry out the following functions and submit its recommendations to the MoST:

Set out a detailed process and timeline for ensuring an effective review, and approval mechanics for the National IT Policy and Action Plan.

Create a database of IT and related management and technical expertise available within and outside the country to assist in the planning process, and make initial contact whenever necessary.

Establish detailed terms of reference for various bench marks required within the National IT Policy and Action Plan, including definition of scope.

Identify members for the various Working Group's representing key stakeholders in the IT sector, along with appropriate management and planning expertise, who would undertake the development of the template for the National IT Policy and Action Plan. Selection criteria for members of the Working Groups and its constituent Technical Working Groups will be developed to ensure adequate qualifications and expertise and stakeholder representation.

Estimate financial and other resource requirements necessary for the Working Group's to meet their stated objectives, and for concurrent support activities including logistics, meetings, secretariat expenses, and information dissemination.

Working Group for IT Policy and Plan Template Formulation

The initial exercise has resulted in the basic policy document. As mentioned earlier, since the process is dynamic and the Policy and Plans will evolve with time the design of a "Template" is necessary to define the processes to be followed in order to modify this document. This will also take into account the internal governmental processes to be addressed in order not have a clash of interests and domains with other ministries a later date.

Based on the recommendations of the core planning exercise, the MoST will constitute a Working Group on IT Policy and Plan template Formulation through government notification for a term of six months. The Working Group comprising of approximately twelve representatives from the private sector, academia, government, and policy consultants will be contracted to carry out an intensive planning process, including research and compilation of baseline information, according to approved terms of reference. The Working Group will also be responsible for specifying quantifiable targets disaggregated by functional areas, prepare budgetary estimates, and recommend institutional and management capacity-building, including government administrative organization and reform, for supporting and facilitating the implementation of the policy.

The Working Group will be authorized to form technical working groups to obtain specific sectoral recommendations within prescribed guidelines. This working group will also include designated officials from key government organizations relevant to each focus area. The Working Group will submit two distinct but extensively cross referenced documents comprising the template for all successive National IT Policy and Action Plan, respectively, to the MoST at the end of its term. During the course of its activities, the IT Commission will act as a steering committee for the Working Group and conduct regular progress reviews. The Working Group shall be provided with the necessary financial, executive and administrative support for conducting their functions.

Review of Template for future IT Policy and Plan

The template for National IT Policy and Action Plan will be subjected to intensive internal and external review before it is finalized. For this purpose, several concurrent review mechanisms will be employed, so as to obtain maximum feedback and suggestions from a diverse and geographically dispersed IT community within a short period of one month:

For general public commentary, the template for policy and plan documents will be made available in their entirety on the Web, accompanied by an appropriate advertisement campaign in the print and electronic media to solicit public interest.

In addition, a formal peer review panel of independent experts not associated with the Working Group will be constituted based on the database of IT expertise prepared earlier, and may include foreign as well as local members. This panel could have up to twenty reviewers selected from various fields relevant to the IT Plan. The peer review will be partly structured, in which respondents will be asked specific questions about general adequacy and will rank the draft on predefined criteria, and partly based on detailed comments from the individuals.

In order to expedite subsequent government approval, the template will also be circulated within various relevant government ministries, provincial departments, and line agencies for comments. Important amongst these would be the Ministry of Finance, the Central Board of Revenue, the Ministry of Education and Manpower, the Ministry of Commerce, the Ministry of Industries, the Ministry of Law, PTCL, NTC, SCO, Provincial IT Boards, EPB, ITC, PSEB, and prominent public academic and training institutions.

The MoST, IT Commission, the Pakistan Computer Bureau, and other relevant organizations will conduct seminars and debate on national media in which a dialog on the strengths and weaknesses of the template can be carried out.

It is vitally important that the review inputs be properly documented and addressed. For this purpose, a subcommittee will be formed independent of the Working Group to compile feedback received, which will then be jointly reviewed by the IT Commission and the Working Group to identify those elements of the template that require modification.

The Working Group will be required to make suitable changes to the template in light of the review process, and to present a final National IT Policy and Action Plan template to the Government of Pakistan within one month of the completion of the review, or approximately eight months from initiating its work.

Policy and Plan Template Approval

The final National IT Policy and Action Plan Template will be submitted to various government departments and line agencies for relevant approval and concurrence. Since a detailed review within the government will have preceded this approval, such a process should not entail more than two weeks. Subsequently, the National IT Policy and Action Plan will be enacted under suitable legislative cover, along with the necessary budgetary allocations and administrative actions required.

Establish Management and Monitoring Capability

The administrative changes required to effectively support the National IT Policy and Action Plan will be undertaken swiftly once approval and necessary financing has been obtained. These reforms will be based on the recommendations made by the Working Group and included in the Plan document and will, at a minimum, aim at the creation of a technically competent IT Division within the MoST. This will also address the rationalising and strengthening of the activities of the IT Commission, the Pakistan Computer Bureau, the Pakistan Software Export Board, and the provincial IT Boards. The functions, staffing, and financial requirements for each responsible government agency will be clearly set out to avoid duplication and to consolidate and optimise resource utilization.

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. Standard indicators of IT progress will be devised, which can be continually updated, are broad in scope, and include independent observer verification (e.g., relevant international indices and market surveys). Targets and milestones will be both qualitative (subjective assessments of attitudes, awareness, proficiency, preferences, investor perceptions, etc.) and quantitative (objective evaluation of IT-related data of business, commerce, export, penetration, spending, traffic, sales, manpower, etc.).

Plan Implementation

The National IT Policy and Action Plan will be implemented according to these 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. A formal broad policy and plan review will be conducted under this mechanism every six months, with more area-specific monitoring carried out on a monthly basis.

Consequently, a public-private partnership will be formalized to inherit and continue the functions of the task force in later years and ensure that Pakistan becomes and remains an internationally competitive force in the global IT industry.

Timeline

The timeline shown below is indicative of the perceived duration of the IT initiative, beginning with approval of this plan to completion and enactment of the National IT Policy and Action Plan Template:

Month Component	1	2	3	4	5	6	7	8	9	10	11	12	13
I. STAP													
Preparatory activities for STAP	▓												
Initial STAP draft on Web		▓											
Implement STAP		░	░	░	░	░	░	░	░	░	░	░	░
Post-STAP review													░
National IT Policy & Plan Template													
Core planning	▓	▓											
Establish Working Group		▓											
Template formulation			▓	▓	▓	▓	▓	▓					
Review template									▓				
Finalization of Policy & Plan Template										▓			
GoP approval & enactment											▓		
Implementation & monitoring mechanism											▓	▓	▓
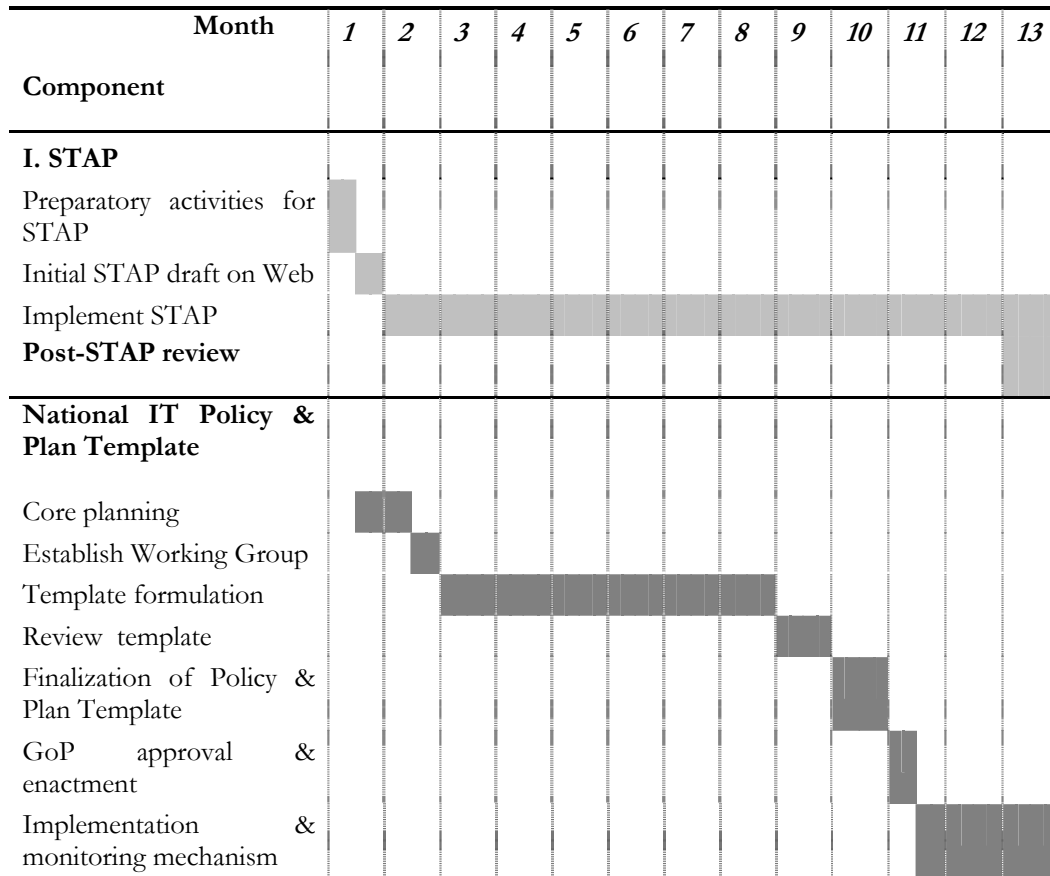
Budget

STAP

The STAP is being formulated initially based on recommendations compiled in the present document. Additional work in identifying and implementing STAP actions will be carried out within the resources of the MoST, IT Commission, and through voluntary effort. Continuing review and management of the STAP will be conducted by the Working Group to be set up shortly. Therefore, an initial outlay for the STAP component will be required.

National IT Policy and Action Plan Template:

The Working Group for formulating the National IT Policy and Action Plan template will require financial support for carrying out its functions effectively, and for compensating its members for the substantial time and expertise that would be required of them. Inclusive of secretarial, overheads, logistics and other direct costs, the total budget for the Working Group would be in the approximate range of Rs. 8 million to Rs. 12 million, or about 0.2% of the total first year budgetary requirement of Rs. 5 billion estimated for the sector.

Development of National Information Infrastructure (NII)

Based upon recommendations received and review undertaken a plan to develop the National Information Infrastructure (NII) will be Private-Public responsibility as evinced in this document. The NII is not just physical infrastructure but encompasses Legislation, human resource development, physical networks, software development and export, Software and Incubation centers, etc.

According to the initial needs assessment there will be a requirement of approximately Rs. 22 Bln for the total plan to fall in place. Of this Rs. 5 Bln. Is foreseen to be seeded from the Government for various elements.

Proposed Allocation of Funds 2000-2001

S#	Details	Amount
1	Ph.D./Masters/Bachelor/Intermediate programs	0.3
2.	Distance Learning and Distance Learning Centers	0.2
3	Retraining Centers of IT for unemployed or under-employed engineers/scientists/professional	0.2
4	Specialized Training Centers for training of Trainers	0.15
5	Internet and Intranet infrastructure for colleges and universities	0.55
6	A Scholarships/Qarz-e-hasna Scheme	0.1
7	Computer Literacy (Computers, Networks, Software, training) at school level	0.21
8	A National Testing Agency be established for standardized testing and certification of IT professionals.	0.1
9	Four Information Technology Institutes (ITTs) be set up one each in Punjab, Sindh, NWFP and Balochistan.	0.4
10	Introduction to other segments (Tele-medicine -Health, Large Data base creation, GIS projects for mapping)	0.25
11	Retrain of government employees, Software purchases, allowances	0.2
12	Software Technology Parks	0.5
13	Data Network Centers	0.075
14	Community Internet Centers	0.08
15	Series of IT awareness seminars	0.05
16	Participation in Major international IT trade fairs, conferences and trade shows	0.05

17	Overseas marketing offices in strategic locations like Singapore, Silicon Valley	0.15
18	Development of Urdu and regional software	0.1
19	Triggering off local data entry and Blue collar IT activity	0.3
20	Venture Capital Seed Fund with public-private partnership	0.2
21	Development and production of IT and communication products	0.15
22	E-commerce pilot, facilitation, training and core infrastructure	0.32
23	e-Government Pilot projects at two Ministries and the CE's office	0.25
24	Legislation drafting for IT related issues,	0.01
	Total Rs. Billion	4.895

The main allocation of funds has been foreseen for training, re-training and Human Resource development.

There are a whole host of other incentives, which include changes in government processes, legislation, administrative elements, incentives and rules and SROs of the CBR, SEC, SBP, etc. These have been (and are being) submitted to the government for approvals.

The Proposed Utilization Plan for the FY 2000-2001

Summary sheet for Fund Flow utilization on account of different heads

Billion rupees

		Total	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	Ph.D./Masters/Bachelor/Intermediate programs:	0.3			0.005	0.035	0.055	0.056	0.0544	0.0189	0.0189	0.0189	0.0189	0.0189
2	Distance Learning and Distance Learning Centers:	0.2	0.001	0.03	0.03	0.03	0.03	0.015	0.0107	0.0107	0.0107	0.0107	0.0107	0.0107
3	Retraining Centers of IT for unemployed or under-employed engineers/scientists/professional	0.2	0.025	0.025	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
4	Specialized Training Centers for training of Trainers	0.15	0.002	0.031	0.032	0.031	0.015	0.005	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
5	Internet and Intranet infrastructure for colleges and universities	0.55	0.095	0.095	0.095	0.095	0.0255	0.0255	0.021	0.018	0.021	0.0197	0.0197	0.0197
6	A Scholarships/Qarz-e-hasna Scheme	0.1	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083	0.0083
7	Computer Literacy (Computers, Networks, Software, training) at school level	0.21			0.0032	0.1	0.06	0.0035	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072
8	A National Testing Agency be established for standardized testing and certification of IT professionals.	0.1	0.05	0.05										
9	Four Information Technology Institutes (ITTs) be set up one each in Punjab, Sindh, NWFP and Balochistan.	0.4	0.0015	0.002	0.18	0.18	0	0	0	0	0	0	0	0.0365
10	Introduction to other segments (Tele-medicine -Health, Large Data base creation, GIS projects for mapping)	0.25	0.015	0.015	0.015	0.055	0.055	0.075	0.02					
11	Retrain of government employees, Software purchases, allowances	0.2	0.05	0.05	0.05	0.05								
12	Software Technology Parks	0.5	0.01	0.035	0.15	0.15	0.0194	0.0194	0.0194	0.0194	0.0194	0.0194	0.0194	0.0194

No.	Description	Total Rs. Billion												
13	Data Network Centers	0.075			0.025	0.025	0.025							
14	Community Internet Centers	0.08		0.04		0.04								
15	Series of IT awareness seminars	0.05	0.01	0.01	0.01	0.01	0.01							
16	Participation in Major international IT trade fairs, conferences and trade shows	0.05				0.015	0.01		0.015	0.01				
17	Overseas marketing offices in strategic locations like Singapore, Silicon Valley	0.15	0.015	0.035	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
18	Development of Urdu and regional software	0.1	0.01			0.045	0.045							
19	Triggering off local data entry and Blue collar IT activity	0.3	0.009	0.01	0.018	0.018	0.035	0.03	0.03	0.03	0.03	0.03	0.03	0.03
20	Venture Capital Seed Fund with public-private partnership	0.2				0.2								
21	Development and production of IT and communication products	0.15	0	0	0	0.01	0.01	0.015	0.015	0.015	0.015	0.02	0.02	0.03
21	Development and production of IT and communication products	0.15	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
22	E-commerce pilot, facilitation, training and core infrastructure	0.32	0.0221	0.0221	0.0371	0.0371	0.0371	0.0371	0.0252	0.0252	0.0195	0.0195	0.019	0.019
23	e-Government Pilot projects at two Ministries and the CE's office	0.25	0.007	0.0015	0.15	0.06	0.005	0.005	0.005	0.0035	0.0035	0.0035	0.003	0.003
24	Legislation drafting for IT related issues,	0.01	0.005	0.005										
	Total Rs. Billion	4.895	0.3484	0.5024	0.8461	1.2219	0.4478	0.3173	0.2594	0.1944	0.1817	0.1804	0.1794	0.2159

Outputs

At the end of the first year, the Government of Pakistan will have:

Instituted, for the first time, a clear and comprehensive National IT Policy and Action Plan comparable in quality and scope with the best globally. This will not only greatly encourage and guide the local IT industry's growth, but will help attract serious international attention towards Pakistan as an IT market and resource base.

An effective planning, implementation and monitoring mechanism in place, the lack of which had stifled all previous national IT initiatives.

Ensured that many of the long-pending actions required for facilitating IT business in Pakistan are implemented without further delay under the STAP, providing a ready momentum on which longer term accelerated growth can take place.

Solid foundation is laid for development of a National Information Infrastructure (NII) that is modular in growth.

Ministry of Science & Technology

IT Policy and Action Plan

SECTION VI – IMPLEMENTATION PLANS OF WORKING GROUPS

Government of Pakistan

August 2000

Implementation Plans of Working Groups

21.1   Several working groups have started their work in preparing basic plans and directions. Some examples of these, which are in a preliminary draft shape, are attached for comments and inputs from stakeholders. These are being included only as examples of continuing work and are not the complete works. For example considerable work has gone in to IPR law draft, Incubators, etc. Of the examples given, only excerpts have been placed here for giving a feel of the work, which has been done and is on going. The final versions of drafts and approved items will subsequently be placed on the Web for information and comments if needed.

21.2   The following documents cover:

21.2.8   PISOC – Pakistan Internet Society:

21.2.8.2   With the growing importance of Internet and considerable activity happening and also proposed in the Policy and Plan a coherence of actions need to be brought in. The PISOC – Pakistan Internet Society is being formed. This will report directly to the Secretary ICT. It will be chaired by an individual who has an in depth view of the Internet and its nuances for the society. Two Chairs will assist him: one for Technology and one for the societal aspects. This document covers the main direction of this group.

21.2.8.3   The E-commerce Plan:

21.2.8.4   Detailed work has already taken place in this area. An excerpt of the main document is attached.

21.2.8.5   Legislation:

21.2.8.6   The working group on the legislation has prepared draft laws to be vetted by the Law Ministry. These are comprehensive and need inputs from other stakeholders as well. These covers not only issues which relate to IPR but also to digital signatures, etc.

21.2.8.7   Human Resource Development:

21.2.8.8   A considerable amount of work has been done by the PITB (Punjab IT Board) and the action plan national implementation has been prepared on the experience so gained and further requirement of the IT Policy. A small excerpt is attached for review.

Pakistan Internet Society

The setup of Pakistan Internet Society (PISOC) is proposed to undertake the following avenues:

Facilitates development of standards, administration and the technical infrastructure of the Internet

Supports education in cities which are not exposed to Internet specifically, and wherever the need exists

Promotes professional development and opportunities for association to Internet leadership

Provides reliable information about the Internet

Provides forums for discussion of issues that affect Internet evolution, development and use -- technical, commercial, societal, etc.

Fosters an environment for international / national cooperation, community, and a culture that enables self-governance to work

Serves as a focal point for cooperative efforts to promote the Internet as a positive tool to benefit all people throughout the country

Provides management and coordination for on-strategy initiatives and outreach efforts -- humanitarian, educational, societal, etc.

With these strategic underpinnings in place, the Pakistan Internet Society will identify and undertake projects to demonstrate its commitment to the mission.

Internet Society Guiding Principles

Open, unencumbered, beneficial use of the Internet.

Self-regulated content providers.

No prior censorship of on-line communications.

On-line free expression is not restricted by other indirect means such as excessively restrictive governmental or private controls over computer hardware or software, telecommunications infrastructure, or other essential components of the Internet.

Open forum for the development of standards and Internet technology.

No discrimination in use of the Internet on the basis of race, color, gender, language, religion, political or other opinion, national or social origin, property, birth or other status.

Personal information generated on the Internet is neither misused nor used by another without informed consent of the principal. Internet users may encrypt their communication and information without restriction.

Encouragement of cooperation between networks: Connectivity is its own reward, therefore network providers are rewarded by cooperation with each other.

PISOC will be the organizational home for the Pakistan Internet Societal Task Force and Pakistan Internet Engineering Task Force, the groups responsible for developing the Internet's social & technical underpinnings. Through their efforts, broad-based consensus is achieved on bringing social, technical and infrastructure change to the national development of Internet.

The Pakistan Internet Society Mission

The PISOC's mission is to assure the open development, evolution and use of the Internet for the benefit of all people throughout the country. To accomplish this mission, we will want to create a clear image, or positioning, for the Pakistan Internet Society. The positioning will serve as the foundation for activities that will drive the market growth initiative.

Pakistan Internet Society Mission Statement

"To assure the open development, evolution and use of the Internet for the benefit of all people throughout the Pakistan."

The Board of Trustees must set a goal for the Pakistan Internet Society to develop Internet users to reach a total of at least 600,000 by the end of 2001. This is a very ambitious goal that will require bold action if we are to achieve it. It will more than likely, could also result in significant change in the organizations, including administrative, member services, culture and management.

The transformation that will undoubtedly occur if we reach the goal will largely trace to a new type of services that will be riding on the Internet Infrastructure.

There will also be a need for greater visibility for the Pakistan Internet Society and its activities. If we are to appeal to a broader audience that is not now aware of the organization, then it will be necessary to take a proactive stance in publicizing what the Pakistan Internet Society stands for and why a prospective new member should consider joining.

The Pakistan Internet Society Positioning

Pakistan Internet Society members will be recognized as leaders in helping the Internet reach its full potential as a positive tool for improving people's lives in the country. This will be because Pakistan Internet Society, sponsors and supports a broad range of projects and initiatives that extend the Internet and highlight its unique capabilities, embraces and promotes an "Internet culture" that fosters effective self- governance based on broad-based consensus building processes. PISOC will have today's Internet leaders in the country as active members, officers and trustees.

The Pakistan Internet Society will serve as the national organization for the national / global coordination and cooperation on the Internet, promoting and maintaining a broad spectrum of activities focused on the Internet's development, availability, and associated technologies. The Pakistan Internet Society will not only act as a national clearinghouse for Internet information and education but also as a facilitator and coordinator of Internet-related initiatives around the country. Through its annual national Networking

(PNET) conference and other sponsored events, provincial / city training workshops, tutorials, statistical and market research, publications, public policy and trade activities, regional and local chapters, standardization activities, committees and an national secretariat, The Pakistan Internet Society will serve the needs of the growing global Internet community, from commerce to education to social issues, our goal will be to enhance the availability and utility of the Internet on the widest possible scale.

Purposes and Goals of the Organization

Its principal purpose will be to maintain and extend the development and availability of the Internet and its associated technologies and applications. Both as an end in itself, and as a means of enabling organizations, professions, and individuals nationwide to more effectively collaborate, cooperate, and innovate in their respective fields and interests.

Its specific goals and purposes include:

Development, maintenance, evolution, and dissemination of standards for the Internet and its internetworking technologies and applications.

Growth and evolution of the National Internet Architecture / Infrastructure

Maintenance and evolution of effective administrative processes necessary for operation of the National Internet Highway

Education and research related to the Internet and internetworking;

Harmonization of actions and activities at international levels to facilitate the development and availability of the Internet

Collection and dissemination of information related to the Internet and internetworking, including histories and archives;

Assisting technologically Balochistan and NWFP and remote areas in Sindh and Punjab, in implementing and evolving their Internet infrastructure and use;

Liaison with other organisations, government and the general public for coordination, collaboration, and education in effecting the above purposes.

PISOC Programs

PISOC will be involved in a variety of initiatives stemming from technological, educational, social, economic, standards, political, ethical, and legal sources, which influence the direction of the Internet.

Interconnectivity and standards development:

PISOC is the organizational home for the Pakistan Internet Engineering Task Force, the group responsible for developing the Internet's technical underpinnings. Through their efforts, broad-based consensus will be achieved on bringing technical / infrastructure change to the Internet.

Industry self-governance:

The multi-organizational effort we put together for specifying and implementing generic Top Level Domain policies and procedures is pioneering international / national self-regulation of the Internet.

Protection against excessive regulation:

PSOC will going to watch closely though PISTF to the regulatory changes taking place in the developed world specially in USA and will take steps after careful evaluation process bringing in line with the current country specific scenario.

Premier national / international conference:

PNET is the annual PISOC conference, which focuses on national/ global issues of the Internet by bringing together the cyberspace leaders who are developing and implementing Internet networks, applications, and policies for the worldwide infrastructure. PISTF and PIETF will jointly work out the program to invite people and opinion leaders from their respective area of working.

Security on the internet:

PISOC will annually sponsor the symposium on National Network and Distributed System Security, which fosters the exchange of

technical information on security. A secure Internet is critical to facilitate electronic commerce and the overall commercial viability of the Internet.

E-commerce:

PISOC jointly though PISTF and PIETF will work in bringing a social and technological change in the country to suppot E-Commece infrasruture, enabling secure transactions to take place on the national WEB.

Education:

One of our primary areas of focus, with multiple programs. The K-12 Educational Networking Workshop is a one-day training program for primary and secondary school teachers and administrators followed by ISOC. The Internet Network Technology Workshop is an intensive course series to train engineers from technologically emerging nations on the operation and management of the Internet. Many of our graduates can be credited with the successful implementation of the Internet in their countries. PISOC will sponsor in line with ISOC on a national program to develop the necessary human resource. ThinkQuest - an international, million dollar, scholarship program for secondary school students is being carried out by ISOC to enable student to use Internet extensively, PISOC will follow the same guidelines.

Publications:

PISOC will publish a bi-monthly magazine, "PakNet", and a monthly electronic newsletter which will be sent through each ISP to the user base, thus informing the user base about the latest happening on national level on Internet and break throughs on technology and paradigm shift internationally.

Mothers & Children:

PISOC is committed to promoting child safety online. Special programs developed for promoting Internet to mothers and kids will be formulated and will be driven to induce Internet from the very grass root level.

Organizational set-up

PISOC will primarily consist of two task forces and a board which will take a consensus based decision on the recommendations of PIETF and PISTF:-

Pakistan Internet Engineering Task Force

The Pakistan Internet Engineering Task Force is an organized group of people who will make technical, commercial and other contributions to the engineering, industry and evolution of the Internet and its technologies in the market. It is the principal body engaged in the development of Internet standard specifications in Pakistan. Its mission includes:

Identifying, and proposing solutions to, pressing operational and technical problems in the Internet. e.g. IP allocations, AS allocations, responsibilities of NIC.

Specifying the long term and the near-term architecture to solve such technical problems for the Internet

Making recommendations to the PISOC board regarding the standardization of media, network infrastructure, growth in the usage in the Internet

Facilitating technology transfer from the Developed Internet Infrastructure Countries to the wider Pakistani Internet community.

Providing a forum for the exchange of information within the Pakistan Internet community between vendors, users, researchers, agency contractors and network managers

Providing a forum for exchanging the information from the consumer and supplier to maintain a uniform grade of service

The actual commercial / technical work of the PIETF will be done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, Grade of Service (GOS), Customer Focus Group, E-Commerce, Internet Banking, etc.).

Much of the work will be handled via mailing lists. The PIETF will hold meetings four times per year

The PIETF working groups are grouped into areas, and managed by Area Directors, or ADs. The ADs are members of the Pakistan Internet Task Force. The PSOC board will adjudicates appeals when someone complains that the PIETF has failed. The PIETF will be chartered by the Pakistan Internet Society (PISOC) for these purposes. The General Area Director also serves as the chair of the PIETF, and is an ex-officio member of the PSOC Board

PIETF Secretariat - Please send only problem reports to pietf-web@pietf.org.pk

Pakistan Internet Societal Task Force (PISTF)

PISTF will be formed and all interested parties will be invited to join in discussions about those critical aspects of the Internet that deal with policy issues affecting users in the national Internet community from a societal perspective. Contributions and input to the PISTF are open to all citizens, not just Pakistan Internet Society members. We want to get the broadest participation possible. The Pakistan Internet Societal Task Force will be an organized group of people who take a societal view of the impact Internet will have in the growth of the country. PISTF will make contributions to the growth in the industry and the evolution of the Internet to help eradicate illiteracy, poverty and bring about a cultural change in the country. PISTF will propose alternatives and continuously work for the betterment of the people and the country to bring a quality change in the life style of the countrymen. PISTF will be the principal body engaged in the development of Internet culture in Pakistan. Its mission includes:

Identifying, and proposing solutions to, pressing educational, health, SAP through the Internet. E.g. Setting up Distant Education Model Centers, Setting up Internet based Commodity exchanges whereby frames can sell their crop without involving the middle man, Model Internet Community Center etc.

Specifying the long term and the near-term Internet exposure on our education institutions to solve human development problems for the Internet.

Specifying the long term and the near-term Internet exposure on our society and work accordingly to bring a positive change to the country.

Making recommendations to the PISOC board regarding the standardization of media, content, growth in the usage in the Internet.

Facilitating and enabling remote villages to setup their own Internet community centers thereby solving the access to the global village and to the wider Pakistani Internet community.

Providing a forum for the feedback from the consumer to maintain a bilateral feedback system in place by the general society.

The actual work of the PISTF will be done in its working groups, which are organized by topic into several areas (e.g., Education, Content, Law, Consumer right, Intellectual Property Right, Customer Focus Group, E-Commerce culture & its implications etc.). Much of the work will be handled via mailing lists. The PISTF will hold meetings four times per year.

The PISTF working groups are grouped into areas, and managed by Area Directors, or ADs. The ADs are members of the Pakistan Internet Societal Task Force. The PISOC board will adjudicates appeals when someone complains that the PISTF has failed. The PISTF will be chartered by the Pakistan Internet Society (PISOC) for these purposes. The General Area Director also serves as the chair of the PISTF, and is an ex-officio member of the PISOC Board.

PISTF Secretariat - Please send only problem reports to pistf-web@pistf.org.pk

PISOC Funding and Self Sustainability

In contemplation of the need for a mechanism for aggregating funding from many sources, it is proposed to use PISOC resources, in part, to provide funds in support of PIETF. The plan is for the Society to engage in a variety of activities including conferences, workshops, and raise funds from industry and other institutional sources. It does so on an international/national basis, and acts as a neutral and internationally recognized body, devoted to the support of Internet administrative infrastructure, including, for example, PIETF and PISTF.

Following are the action points which are required to be implemented:

Formation of PISOC, PIETF and PISTF.

The appointment of the Chairperson for the PISOC by Minister of Science & Technology.

The Chairperson of PISOC with approval from Minister Science & Technology will appoint Chairpersons for PSITF and PIETF to carry out the task of nominating slates of appointees for PISTF & PIETF.

PIETF and PISTF chairperson will call for the Area Director positions in the identified fields and their member working group nominations and will finalize the WG.

The board of PISOC will consist of Chairperson of PISOC, members of the board will comprise of the following:

Chairperson of PISTF

Two Member from ISPAK

Single Member from PTCL

Single Member from Ministery of Information and Media

Single Member from Ministery of Education

Single Member from Ministery of Law

Single Member from Ministery of Commerce

Single Member from Ministery of Finance

Meeting of the board will be called by Chairperson of PISOC.

PIETF and PISTF will meet and finalize the action plan needed in short and long terms views and will propose the recommended to Board for approval. Once approved it will be sent for approval from Minister S&T and onward implementation.

All positions will be based on voluntary and honorary basis.

Election for the Chairperson of PISOC, PIETF and PISTF will be held after every two years. All other positions are based on nominations from the respective industry and ministeries.

PISOC will establish a membership relationship between ISOC and the ITU which forms a basis for any desired coordination between activities of ISOC and various activities of the ITU, notably the

ITU- Standardization Sector (ITU-T), the ITU-Radio Sector (ITU-R) and the ITU Development Sector. The activities of the PIETF are most closely related to those in ITU-T, so exchange of information, joint meetings or other coordinating efforts, if any are desired, would presumably take place between PIETF and ITU-T. There is no requirement for any particular interaction between these groups, only the potential should it be deemed mutually beneficial.

Organization member:

The success of many countries / organizations depends upon Internet related decisions being made every day by policy makers, standards organizations, and legislators around the world. Those decisions have a direct impact on how well countries / organizations can plan for the future, serve their customers, and compete in the digital age. PISOC will provide leadership in keeping the Internet open and usable. PISOC will bring diverse interests together to hammer out reasonable solutions to the many issues and concerns which the new applications of the Internet are generating. With the support of the members that enables PISOC to do this and to lead in helping to ensure the stable growth of the Internet.

PISOC members will include corporations, non-profit, trade and professional organizations, foundations, educational institutions, government agencies and other international organizations with varied interests. They share a commitment to the health of the Internet. These key players from around the country have demonstrated this commitment through their support of the Internet Society.

Implementation of E-Commerce in Pakistan

Introduction

Electronic Commerce offers opportunities for increasing trade efficiencies by eliminating communication delays and reducing the costs of documentation. It does so by enabling trading partners to exchange transaction data electronically. This reduces errors, costs and transaction delays, and results in tremendous increase of productivity and efficiency. Countries around the world have put in place extensive infrastructure that enables the stakeholders to transact data electronically, the stakeholders include government and private organizations such as customs, port authorities, traders and banks

Electronic Commerce is becoming important not only for logistics efficiency and productivity gain reasons but also because electronic enablement may soon become a condition for trading with countries. Hence to take advantage and to remain a global trading partner Pakistan has to install the required infrastructure for electronic commerce.

E-Commerce Objectives for Pakistan

Diversification of exports: New markets, new products, new businesses.

Greater role of SMEs in exports as e-commerce provides low cost accessibility to markets and services which was not available before.

Survival in the emerging global electronic economy, greater transparency, better monitoring and supervision

Facilitate international trade through an e-commerce infrastructure whose presence is becoming a prerequisite for participation in global trade and economy

Increased efficiency of business transactions, logistics and increased competitiveness

Electronic documentation of economy.

Use of E-Commerce in government for procurement, promotion of trade, provision of information and trade related services

To revitalize the economy by exploring the new potential of Electronic Commerce in B2B and B2C trade and services, worldwide

Simplifying citizens' access to government while providing choices and options for interaction with government

Financial Impact of Full Scale Implementation

It is estimated that full scale implementation of e-commerce in Pakistan would have the following financial impact on the economy

	Widening of Tax-net due to Electronic Documentation	
1.	Legitimate part of black economy	Rs. 30 bn
2.	Illegitimate part of black economy	Rs. 5 bn
3.	Single Invoice System	Rs. 4.5 bn
4.	Hundi system	Rs. 2.5 bn
	Cost Savings and increased competitiveness	
5.	Efficiency gains (manufacturing sector, logistics, financial, information and other services)	Rs. 18 bn
	Total	Rs. 60bn
	Foreign Exchange Impact	
6	Increase in exports	$ 800m
7	Increase in capitalization	$ 400m
8	Worker remittances	$ 800m
	Total	$2000m
	Source: AERC RR#91, 95 and PIDE 1999	

Critical Factors in E-Commerce Development

Leadership, ownership and commitment for the implementation of E-Commerce.

Creating awareness, promoting E-Commerce and providing education / training

Motivating and monitoring the progress of implementation.

Establishing the necessary infrastructure for connectivity, services and manpower.

Enabling a stable legislative environment.

Ensuring the preparedness of business and government organizations for adoption.

Experience of other Countries

Analysis of countries at various levels of development has helped in identifying the critical factors in developing a systematic national plan for implementing E-Commerce:

	Electronic Commerce Development		
	Highly Developed	**Developed**	**Developing**
Countries	USA, Canada, Nordic, and some EU countries…	EU, Australia, New Zealand, Japan, Korea, Singapore, Taiwan, HK	China, Brazil, India, Thailand, Malaysia
Leadership	Leading contribution from industry leaders, Govt. backed and market driven	Mostly government led, significant contribution of private sector	Government led, supported by private sector
Motivation and coordination for policy making, standardization and implementation	Privately led with strong public-private partnership	Government-private partnership	Increasing government commitment and moving to private-government partnerships
Awareness And Training			
Estimated %age of internet users	>35% of population Very High	2-15% High-Medium	<2% Low
Motivation for E-Commerce	Competitive advantage	Efficiency / Productivity	Reduce cost & leakage, Increase transparency

	Electronic Commerce Development		
	Highly Developed	**Developed**	**Developing**
Electronic trading experience	Over 20 years	Around 10 years	Just starting
Awareness in government departments	High: Actively involved in new initiatives.	High: Well defined objectives, clear direction	Medium to Low: Thrust of EC implementation is lacking
Education and Training	Very High	High	Medium to Low
Infrastructure			
Services infrastructure	V. High: Well established proprietary VAN and VAS providers	High: Established service providers	Medium to Low: Service providers coming up for various services
Telecommunication, networks	Liberal, extremely competitive, low cost, high penetration, private and Govt. networks		Monopolistic, high costs. Low penetration
EDI Implementation	Fully matured B2B, B2G, B2C, G2G, trading &mfg	Govt., trading networks and industries	Recently started on EDI trading networks
Legislation and Regulation			
Domestic legislative environment	In place	Mostly in place	*Bills pending or working on the bills*
International legislative frame-works	Leaders	Collaborators	Followers
Organizational Preparedness			
Business	All functions automated. Supply chain mgmt, mfg, sales, trading, services	Trading and financial networks, supply chain management	Establishment of trading networks in process
Business preparedness	Aggressively poised	Established and growing	Recently started
Internal automation of business & govt. orgs.	Fully automated and integrated	Internally automated and integrated	Partly automated. Some still lack automation

It should be noted that, although we are trying to catch up with developing countries, the developed and highly developed are not stationary. They are aggressively investing and continuing their efforts to maintain their competitive advantage and leadership in Electronic Commerce. The question today is first of survival and then for creating a niche in the emerging digital economy, driven by Electronic Commerce all over the globe.

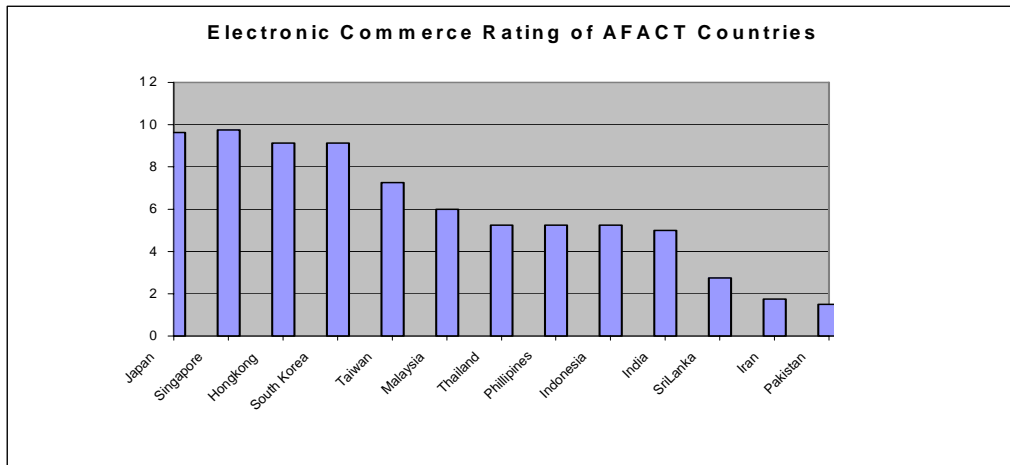**Pakistan's E-Commerce Preparedness in the Region**

AFACT (Asia Council for the Facilitation of Procedures and Practices for Administration, Commerce and Transport) aims to support in the Asia-Pacific region policies and activities, especially those promoted by UN/CEFACT. It is dedicated to guide, stimulate, improve and promote the ability of business, trade and administrative organizations for members, to exchange products and relevant services effectively. Currently, 14 countries are members of AFACT and fourteen working groups are performing their duties in their specific fields. A review of the progress reports submitted by AFACT member countries show that much progress has been made for facilitating trade. However, Pakistan which is not a member lags behind. This is shown in Table.

Table: Electronic Commerce Development in AFACT Countries						
Country	Legal Status	Infrastructure Readiness	Awareness, Education	E-Commerce Investment	Rating	Number of EC Users
Japan	H	H	H	H	9.63	60,000+
Singapore	H	H	H	H	9.75	22,800
Hong Kong	H	H	H	H	9.13	75,000
S. Korea	H	*H*	H	H	9.13	15,000
Taiwan	H	H	M	M	7.25	7,000
Malaysia	M	M	M	M	6.00	1,000
Thailand	M	M	M	L	5.25	1,000
Philippines	M	M	M	L	5.25	1,000
Indonesia	M	M	M	L	5.25	1,300
India	M	M	M	L	5.00	3,000
Sri Lanka	L	L	L	VL	2.75	<100
Iran	VL	VL	L	VL	1.75	<100
Pakistan	-	L	L	-	1.50	-

H	High
M	Medium
L	Low

Note: This is a subjective evaluation of the progress reports submitted by the member countries of AFACT.

VL	Very Low

Electronic Commerce Rating of AFACT Countries

A bar chart titled "Electronic Commerce Rating of AFACT Countries" with a vertical axis scaled from 0 to 12 (in increments of 2) and countries listed along the horizontal axis: Japan, Singapore, Hongkong, South Korea, Taiwan, Malaysia, Thailand, Phillipines, Indonesia, India, SriLanka, Iran, Pakistan.

It is based on the evaluation of the latest reports submitted by member countries to AFACT which are described elsewhere in the study. Please note that Pakistan has not yet obtained membership of AFACT and lacks behind all the others.

Infrastructure Development

The plan has been devised after detailed study of guidelines for implementing electronic commerce in developing countries and experiences of countries that have implemented electronic commerce or are in the process of implementing. The experiences and government initiatives of countries that have been studied and analyzed include Singapore, Korea, Australia, Malaysia and India.

Stakeholders in Electronic Commerce

Electronic Commerce infrastructure for Pakistan should provide connectivity to all the stakeholders in trade related transactions so that they can electronically complete the transactions. Initially, emphasis should be on facilitating international B2B trade so that Pakistan can retain its existing foreign trading partners and pursue new trading partners. B2B E-Commerce constitutes over 80% of electronic trade and it requires a special infrastructure whereas B2C Electronic Commerce which is less than 20%, does not require any special infrastructure and may be conducted through the existing internet infrastructure. The document therefore focuses on infrastructure requirements for international B2B trade component, which is of greater concern to our

economy, and for our fiscal and monetary policy and also requires extensive government intervention.

The stakeholders involved in international trade may be divided among those belonging to public sector and private sector:

The public sector stakeholders include government organizations such as Pakistan Customs (CBR), State Bank of Pakistan (SBP), Export Promotion Bureau (EPB), Sea Port Authorities like Karachi Port Trust (KPT) and Port Qasim Authority (PQA), Civil Aviation Authority (CAA), and dry port authorities.

The private sector stakeholders within Pakistan are the trading companies, clearing and forwarding agents, shipping agents, airlines, shipping lines, local and foreign banks, insurance companies, trade associations and others. The private sector stakeholders outside Pakistan are the foreign trading companies, branches of foreign and local banks, shipping and airlines.

EC-Pak Network Service for Stakeholders

The proposed structure for the national network for Electronic Commerce is given in Figure 1 below. It would be referred to in this document as EC Pak Network Service or just EC Pak. This network would allow all the stakeholders to communicate with each other and would be run by an independent third party service provider. EC Pak would provide specialized value added services essential for electronic commerce such as security, message distribution, audit trail, acknowledgement and other services that are more extensive and more advanced than those provided by a typical Internet Service Provider (ISP).

Figure 1:
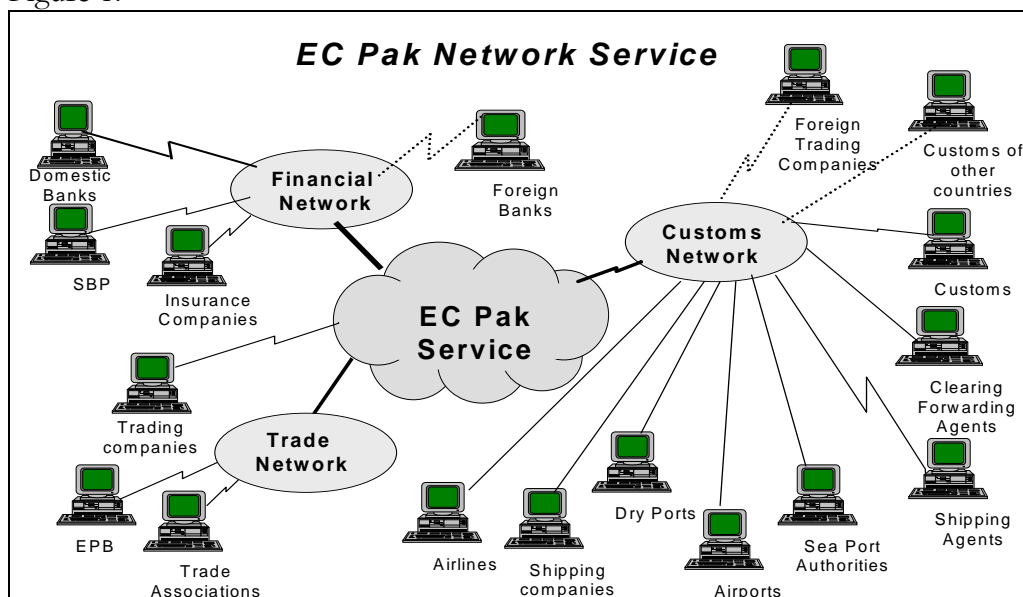
EC Pak Network Service

Note that a national network is not usually designed as one giant network connecting all the stakeholders together. It actually comprises of several networks some of those are shown in the Figure. EC Pak network provides connectivity among all the stakeholders either directly or via the other three specialized networks shown in the figure. Some stakeholders such as the trading companies, shipping companies and airlines are directly connected to EC Pak. Other stakeholders connect to EC Pak indirectly via their own specialized networks. They have special security, services or formats requirements which can not be fulfilled directly by a general network like EC Pak. Therefore, there is need for specialized networks that are shown in Figure 1 that provide customized services for selected groups of stakeholders. These are the Financial Network, the Customs Network, and the Trade Network.

Financial institutions typically have their own special network because security requirements are very stringent for financial transactions such as funds transfer. Furthermore, financial messages adhere to special industry standard formats and services. Supporting the entire range of these formats or services is not feasible for a generalized network like EC Pak. The "Financial Network", therefore, will connect all the financial institutions including local and foreign banks, State Bank of Pakistan, insurance companies, and other international branches of banks. This would be a network like SWIFT for which extensive planning has already been done in Pakistan. Please note that at a later stage the insurance companies may be separated into a special network of their own.

Similarly, special legal and documentary requirements for goods crossing the borders necessitate a special network that would mainly be concerned with facilitation of international trade through ports. This is called "Customs Network". This is a specialized network connecting primarily government organizations such as Pakistan Customs and various port authorities. It would connect Pakistan Customs, clearing and forwarding agents, seaports, dryports, airports. Also connected to this network would be some international links through which customs of other countries and foreign traders can get access. Please note that internally Pakistan Customs should be connected with other CBR departments. Study of such internal connectivities and connections to otheeer governmental networks not shown in the figure is beyond the scope of this study.

The Trade Network connects all the trade associations and government organizations like Ministry of Commerce, Export Promotion Bureau, Corporate Law Authority (CLA). This network would enable importers, exporters and local traders to register, search for leads and find trading partners within and outside Pakistan.

Leading the Electronic Commerce Implementation

The implementation process of e-commerce in Pakistan would require a concerted effort among all the stakeholders including relevant ministries, SBP, EPB, CBR, Banks, Port Authorities, Shipping and Air Lines, Insurance, Clearing and PSI companies, Chambers of commerce, trade associations and other agencies as highlighted in the IBA Research Study on the implementation of e-commerce.

Furthermore, implementation process of e-commerce in various countries has been led by a central organization with mandate and responsibility for raising general awareness for e-commerce, education and training, infrastructure development, trade facilitation, legislation and enabling the use of e-commerce in government and private sector.

Responsibilities of EC Board

EC Board shall be responsible for the implementation of E-Commerce in Pakistan and shall be the focal point for guidance, coordination, monitoring and resolution of issues among the stakeholders. Its functions would be to:

Provide leadership, ownership and commitment for the implementation of E-Commerce

Establish the necessary infrastructure for EFT, trade facilitation, connectivity and e-commerce message delivery, security and other services

Motivate and monitor the progress of implementation.

Create awareness, promote E-Commerce and provide education / training.

Enable stable regulatory and legislative environment

Ensure preparedness of private and public sector organizations for adoption of e-commerce

EC Board shall operate through a project directorate for the full-scale implementation of e-commerce in Pakistan

The Board would work closely with regional and international bodies such as AFACT (Asia Council for the Facilitation of Procedures and Practices for Administration, Commerce and Transport), UN-EDIFACT and similar e-commerce bodies in other countries for guidance and transfer of technology for electronic trade facilitation.

Structure of EC Board

Chairman:	Minister for Science and Technology
Secretary:	EC Professional with responsibility of implementing e-commerce in Pakistan
Project Directorate	IBA
Member Bodies	CBR/PRAL
	PTCL
	Banks
	CAA/Port Authorities
	EPB/Ministry of Commerce
	State Bank of Pakistan
	Shipping/Air lines
	Other relevant stake holders

EC Board shall have a project directorate at Karachi, since 87% of foreign trade transactions occur there. The directorate will spearhead all the initiatives and activities for the e-commerce in Pakistan. The Project Director reporting to the Minister of Science and Technology/Secretary IT Division shall be an e-

commerce professional well versed with the requirements and issues for implementing e-commerce in Pakistan.

Structure of Project Directorate

There are a total of Fourteen Working Groups at AFACT and a similar number of groups at other countries. The project directorate shall establish relevant working groups in different areas of e-commerce. Five working groups have already been established in the areas of Electronic Funds Transfer, Infrastructure, Trade Facilitation, Legislation and Awareness and Training. The action plan for e-commerce in the National IT Policy has been developed on the basis of the recommendations of these working groups. These and other working groups will play the key role in implementation of e-commerce in Pakistan. Professionals with relevant experience from various stakeholders shall be members of these working groups.

Specialized Working Groups under EC-Board

The Project Directorate shall setup 14 specialized working groups according to the AFACT guidelines. For immediate planning and implementation of Electronic Commerce, following five groups have been established and have already started working:

Trade Facilitation (Messages Development)

Awareness, promotion, education and training.

EC Infrastructure implementation

Electronic Fund Transfer

Laws, regulations and standards for Electronic Commerce.

Working groups would work in consultation with government, business and electronic commerce communities. They would prepare short-term, medium term and long-term plans for implementation in their specific areas. They shall report their progress to the EC Board. Each of the working group has already started on Pilot Projects.

There are a total of Fourteen Working Groups at AFACT, operating on regional basis. We suggest that we shall learn from others experience, and on the same lines we shall establish relevant working groups for all the sectors of Electronic Commerce. We have established five working groups, additional working groups may be formed later. These working groups will play the key role in implementation of Electronic Commerce in Pakistan. Stakeholders from various sectors would be nominated as the members of these working groups.

Awareness, Education and Training Working Group (WG1):

Members: NIFT, CDC, Educational Institutions, CSP, PASHA, Industry Associations, Media and other relevant organizations for propagation and training of e-commerce.

Responsibilities

To create awareness in business, industry and Govt. for E-Commerce

To propagate and promote the benefits of E-Commerce extensively.

To arrange for education of stakeholders / users

To arrange extensive training courses to create a pool of E-Commerce professionals

Infrastructure Working Group (WG2):

Members: IBA, PTCL, SBP, Customs, EPB, Banks and other stake holders

Responsibility

To plan, implement and monitor the E-Commerce infrastructure, all over the country

To work out low cost connectivity options

To co ordinate with international agencies for long term investment on infrastructure

To train the relevant officials, for management of reliable E-Commerce infrastructure

Trade Facilitation (Messages Development) Working Group (WG3):

Members: EPB, Customs, SBP, Ports, Airlines, Shipping lines, Banks and other stakeholders.

Responsibility

To develop standard message structure for various e-commerce services

To develop Internet / EDI/XML and other technologies interface

To develop low cost, proven and effective solution to the end users

To co-ordinate with UN/EDICAFT and AFACT for guidance / consultation

Legal/Regulatory Working Group (WG4):

Members: SBP, Customs and stakeholders from private and public sector.

Responsibility

To create environment for acceptance of paperless environment

To identify, prepare and present the laws for legislation

To liaison with international bodies for cyber laws and implementation

To protect the consumer from cyber crimes

Electronic Fund Transfer

Members: SBP, Solution Providers, utility companies, Internet merchants, financial institutions and other stakeholders.

Responsibility

To establish National Electronic Fund Transfer System linked to all the banks and financial institutions in the country and connected to the international financial systems.

To establish electronic monitoring system for State Bank of Pakistan

To enable Internet merchant accounts.

To create the culture of electronic money, to promote documentation of economy

Target Areas for Implementation

Catalyze Infrastructure Projects

EC-PAK

EC-PAK shall be created as a Public-Private partnership, with equity of 30-70 ratio. As we learn from the experience of other developing countries, all the stakeholders shall share in equity, ensuring the active participation in the implementation process.

This Company shall be headed by Director General EC Board, who will be ex-officio CEO of the company. This can be Public or Guarantee Ltd. Company (Although the function of the EC-PAK will be different, but in nature CDC can be quoted as a good example)

EC-PAK will provide all the services for Electronic Commerce in Pakistan. It will be the major service provider for B2B, B2C and B2G services. This will be the contact point for various incoming or outgoing networks, and most of the national and international traffic of E-Commerce will be routed through EC-PAK.

TRADE-PAK

This will be a service for the importers and exporters. A database of all importers and exporters with relevant information will be developed and linked to the international inquiry centers. It will act as a clearing house for information about trade leads and would help the importers and exporters in finding trading partners matching their requirements. This will be established at EPB, and separate set of equipment and staff will be required to maintain this database and network. It will be basically meant for increasing the export and reducing the import cost, through alternate source.

Development of Legal and Regulatory Framework

There is need for e-commerce laws and regulations starting with the implementation of laws that encourage the implementation of electronic commerce. This should be followed by control on fraud, protection of intellectual property, consumer rights, and regulation of online content. This has been extensively covered in Vol-III of this study.

Participation in International Deliberations

E-Commerce dilutes national boundaries and has implications for fiscal and monetary policies that are beyond the control of individual nations. Collaboration and cooperation between governments from different countries is required in multilateral and bilateral forums so that national interest can be safeguarded. There is need for developing cooperative approaches in areas such as legal and regulatory framework, taxation, financial and monetary policies.

Specialized e-commerce related cells in government departments need to be established for active participation in the highly technical deliberations of international organizations such as World Trade Organization (WTO), Organization for Economic Cooperation and Development (OECD), Asia Pacific Economic Cooperation (APEC) and World Intellectual Property Organization (WIPO).

For facilitating international B2B e-commerce, there are regional bodies for cooperation such as EDIFACT for Trade Facilitation. Pakistan should become a member of the relevant regional body in Asia-Pacific region, namely, AFACT.

The objectives of these interactions would be to learn about the improvements required in the domestic electronic infrastructure so that Pakistan can remain competitive with our major trading partners in terms of pricing, logistics and legal and regulatory framework.

Delivery of Electronic Government Services

Countries like Singapore have used e-commerce to increase their efficiencies to an extent where it costs 70 percent less than paper based systems. Pakistan can also obtain similar efficiencies through appropriate infrastructure.

E-Commerce increases operational efficiencies and decreases transaction costs for both the public and the private sector. To encourage e-commerce, government needs to become a model user of electronic delivery systems. This will be a key driver for the rest of the economy, by encouraging others to do their business online.

Public sector being the largest buyer of goods and services can promote e-commerce standards by establishing an electronic procurement system.

There is need for electronic delivery of core public services such as public information, rules and regulations, cultural resources, health services, utilities, and other administration services. Electronic work-flows greatly expedite government work which is highly information-intensive in terms of data collection, archiving, dissemination, and processing.

For transmitting trade related government services online there is a need to prioritize the computerization of government institutions. An aggressive plan needs to be pursued for the internal computerization of Customs, Karachi Port Trust (KPT) and Port Qasim, Civil Aviation Authority(CAA), the Dry Ports, State Bank of Pakistan (SBP), Banks, and Export Promotion Bureau (EPB) that need to be completed by the end of 2003.

Integration of internal systems of these various government agencies needs to be completed by the end of 2005

Creating Awareness, Promoting Use and HR Development

Awareness and Training working group of the EC council would have the responsibility for overseeing the effort in this area. This group would have the responsibility to foster and encourage awareness and undertake of e-commerce among large and SMEs.

Despite the hype associated with Internet, there exists a remarkable lack of awareness about the implementation effort required for E-Commerce. Implementation is often equated with setting up of a web-site that can act as a storefront for B2C e-commerce. Importance of prerequisite for E-Commerce such as internal automation, process reengineering and integration of various business functions is often ignored.

Awareness is required about the type of E-Commerce model needed by an organization. The model depends upon the nature of business operations, the type of interactions with stakeholders, the volume, type and frequency of transactions, and the long-term objectives. Awareness is also required about the need for supply chain integration to realize the maximum benefits. This requires setting up automatic handling of transactions with major stakeholders without manual intervention.

The current estimate of Internet users is about 1.5 to 2.5 lacs which reflects a very low level of awareness. A survey of over 500 organizations in Karachi indicates that there are 35% organizations that do not have Internet, and 20% do not have computer.

Another major awareness issue is to explain to the potential users what should be the motivation for the use of E-Commerce. Experience of other organizations suggests that an organization must go through the following stages:

First stage is the realization that Electronic Commerce is going to reduce costs, reduce errors, reduce duplication and reduce time for the communication of information about transactions.

Second stage is that of increasing productivity and efficiency. That is more work in lesser time. This relates to the output. Reorganization of processes enables the organization to produce more with lesser resources.

Third stage is where an organization increases the revenues, enters new markets, introduces new products, and starts using Electronic Commerce not to keep up with the others but for obtaining competitive advantage.

Development of case studies of local experience of electronic commerce. Publicizing the success stories would greatly contribute to raising the motivation level. Guidelines for implementing electronic commerce should be prepared for large, medium and small size enterprises with a step by step procedure with cost-benefit analysis.

Seminars, workshops and training courses should be used to increase awareness in public and private sector organizations about e-commerce. For

meeting the HR needs for e-commerce implementation close partnership between governments, education and training providers and business will be essential. Develop and train personnel in the country to use, develop, implement and maintain the e-commerce infrastructure. The Government of Pakistan should allocate funds to give educational loans to candidates who want to get training in IT. These would be like the Vidya Dhan loans in India.

Electronic Funds Transfer and Electronic Banking

The following chart shows the progress that need to be made in enabling the electronic funds transfer and electronic banking in Pakistan
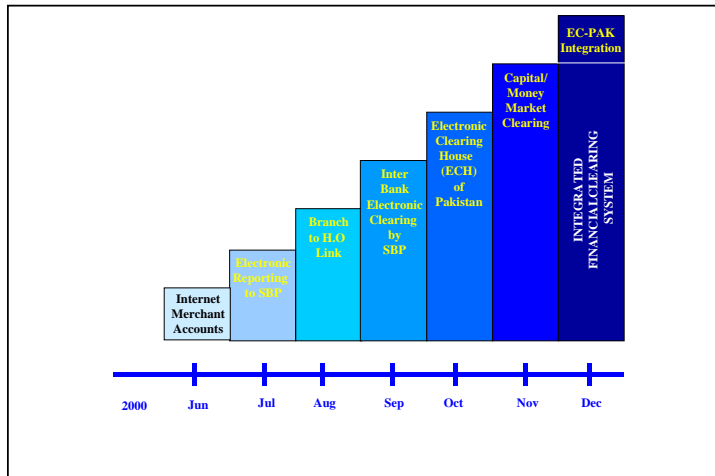
IT Ordinance 2000 *draft*

The following documents are draft legislation changes, which need to go through the relevant Ministries and departments (e.g. SBP, SEC, Ministry of Law, etc).

THE INFORMATION TECHNOLOGY ORDINANCE 2000

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THE INFORMATION TECHNOLOGY ORDINANCE 2000

WHEREAS it is expedient to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce", which involve the use of alternatives to paper-based methods of communication and storage of information, to facilitate electronic filing of documents with the Government agencies and further to amend the Pakistan Penal Code, the Qanun-e-Shahadat Order,1984, the Banker's Book Evidence Ordinance, 1891 and the State Bank of Pakistan Act, 1956 and for matters connected therewith or incidental thereto;

AND WHEREAS the General Assembly of the United Nations by resolution A/RES/51/162 dated the 30th January, 1997 has adopted the Model Law on Electronic Commerce adopted by the United Nations Commission on International Trade Law;

AND WHEREAS the said resolution recommends inter alia that all States give favourable consideration to the said Model Law when they enact or revise their laws, in view of the need for uniformity of the law applicable to alternatives to paper based methods of communication and storage of information;

AND WHEREAS it is considered necessary to give effect to the said resolution and to promote efficient delivery of Government services by means of reliable electronic records;

AND WHEREAS the National Assembly is not in session and the President is satisfied that circumstances exist which render it necessary to take immediate action;

NOW, THEREFORE, in exercise of the power conferred by clause (1) of Article 89 of the Constitution of the Islamic Republic of Pakistan, the President is pleased to make and promulgate the following Ordinance:-

CHAPTER I

PRELIMINARY

1.   **Short title, extent, commencement and application**

(1)   This Ordinance may be called The Information Technology Ordinance 2000.

(2)   It shall extend to the whole of Pakistan and, save as otherwise provided in this Ordinance, it applies also to any offence or contravention thereunder committed outside Pakistan by any person.

(3)   It shall come into force on such date as the Federal Government may, by notification, appoint and different dates may be appointed for different provisions of this Ordinance and any reference in any such provision to the commencement of this Ordinance shall be construed as a reference to the commencement of that provision.

(4)   Nothing in this Ordinance shall apply to,—

    (a)   a negotiable instrument as defined in section 13 of the Negotiable Instruments Ordinance, 1881;

    (b)   a power-of-attorney as defined in section 2(21) of the Stamp Act, 1899;

    (c)   a trust as defined in section 3 of the Trusts Act, 1882;

    (d)   a will as defined in clause (h) of section 2 of the Succession Act, 1925 including any other testamentary disposition by whatever name called;

    (e)   any contract for the sale or conveyance of immovable property or any interest in such property;

    (f)   any such class of documents or transactions as may be notified by the Federal Government in the Official Gazette.

2.   **Definitions**

(1)   In this Ordinance, unless the context otherwise requires,-

(a)   "access" with its grammatical variations and cognate expressions means gaining entry into, instructing or communicating with the logical, arithmetical, or memory function resources of a computer, computer system or computer network;

(b)   "addressee" means a person who is intended by the originator to receive the electronic record but does not include any intermediary;

(c)   "adjudicating officer" means adjudicating officer appointed under subsection (1) of section 46;

(d)   "affixing digital signature" with its grammatical variations and cognate expressions means adoption of any methodology or procedure by a person for the purpose of authenticating an electronic record by means of digital signature;

(e)   "appropriate Government" means as respects any matter enumerated in the Federal Legislative list or the Concurrent Legislative List of the Fourth Schedule to the Constitution, the Federal Government and in respect of any other matter the Provincial Government;

(f)   "asymmetric crypto system" means a system of a secure key pair consisting of a private key for creating a digital signature and a public key to verify the digital signature;

(g)   "Certifying Authority" means a person who has been granted a licence to issue a Digital Signature Certificate under section 24;

(h)   "certification practice statement" means a statement issued by a Certifying Authority to specify the practices that the Certifying Authority employs in issuing Digital Signature Certificates;

(i)   "computer" means any electronic, magnetic, optical or other high-speed data processing device or system which performs logical, arithmetical, and memory functions by manipulations of electronic, magnetic or optical impulses, and includes all input, output, processing, storage, computer software, or communication facilities which are connected or related to the computer in a computer system or computer network;

(j)   "computer network" means the interconnection of one or more computers through—

(i) the use of satellite, microwave, terrestrial line or other communication media; and

(ii) terminals or a complex consisting of two or more interconnected computers whether or not the interconnection is continuously maintained;

(k)   "computer resource" means computer, computer system, computer network, data, computer database or software;

(l)   "computer system" means a device or collection of devices, including input and output support devices and excluding calculators which are not programmable and capable of being used in conjunction with external files, which contain computer programmes, electronic instructions, input data, and output data, that performs logic, arithmetic, data storage and retrieval, communication control and other functions;

(m)   "Controller" means the Controller of Certifying Authorities appointed under sub-section (7) of section 17;

(n)   "Cyber Appellate Tribunal" means the Cyber Regulations Appellate Tribunal established under sub-section (7) of section 48;

(o)   "data" means a representation of information, knowledge, facts, concepts or instructions which are being prepared or have been prepared in a formalised manner, and is intended to be processed, is being processed or has been processed in a computer system or computer network and may be in any form (including computer printouts magnetic or optical storage media, punched cards, punched tapes) or stored internally in the memory of the computer;

(p)   "digital signature" means authentication of any electronic record by a subscriber by means of an electronic method or procedure in accordance with the provisions of section 3;

(q)   "Digital Signature Certificate" means a Digital Signature Certificate issued under sub-section (4) of section 35;

(r)   "electronic form" with reference to information means any information generated, sent, received or stored in media, magnetic, optical, computer memory or similar device;

(s)   "electronic record" means data, record or data generated image or sound stored, received or sent in an electronic form;

(t)   "function", in relation to a computer, includes logic, control, arithmetical process, deletion, storage and retrieval and communication or telecommunication from or within a computer;

(u)   "information" includes data, text, images, sound, codes, computer programmes, software and databases;

(v)   "intermediary" with respect to any particular electronic message means any person who on behalf of another person receives, stores or transmits that message or provides any service with respect to that message;

(w)   "key pair", in an asymmetric crypto system, means a private key and its mathematically related public key, which are so related that the public key can verify a digital signature created by the private key;

(x)   "law" includes any Act of Parliament or of a Provincial Legislature, Ordinances promulgated by the President or a Governor, as the case may be and includes rules, regulations, bye-laws and orders issued or made thereunder;

(y)   "licence" means a licence granted to a Certifying Authority under section 24;

(z)   "originator" means a person who sends, generates, stores or transmits any electronic message or causes any electronic message to be sent, generated, stored or transmitted to any other person but does not include an intermediary;

(za) "prescribed" means prescribed by rules made under this Ordinance;

(zb) "private key" means the key of a key pair used to create a digital signature;

(zc)   "public key" means the key of a key pair used to verify a digital signature and listed in the Digital Signature Certificate;

(zd)   "secure system" means computer hardware, software, and procedure that—

(a) are reasonably secure from intrusion and misuse;

(b) provide a reasonable level of reliability and correct operation;

(c) are reasonably suited to performing the intended functions; and

(d) adhere to generally accepted security procedures;

(ze)   "security procedure" means the security procedure prescribed under section 16 by the Federal Government;

(zf)   "subscriber" means a person in whose name the Digital Signature Certificate is issued;

(zg)   "verify" in relation to a digital signature, electronic record or public key, with its grammatical variations and cognate expressions means to determine whether—

(a)   the initial electronic record was affixed with the digital signature by the use of private key corresponding to the public key of the subscriber;

(b)   the initial electronic record is retained intact or has been altered since such electronic record was so affixed with the digital signature.

(2)   Any reference in this Ordinance to any enactment or any provision thereof shall, in relation to an area in which such enactment or such provision is not in force, be construed as a reference to the corresponding law or the relevant provision of the corresponding law, if any, in force in that area.

CHAPTER II

DIGITAL SIGNATURE

3.   Authentication of electronic records

(1)   Subject to the provisions of this section any subscriber may authenticate any electronic record by affixing his digital signature.

(2)   The authentication of the electronic record shall be effected by the use of asymmetric crypto system and hash function which envelop and transform the initial electronic record into another electronic record.

Explanation.— For the purposes of this sub-section, "hash function" means an algorithm mapping or translation of one sequence of bits into another, generally smaller, set known as "hash result" such that an electronic record yields the same hash result every time the algorithm is executed with the same electronic record as its input making it computationally infeasible:-

(a) to derive or reconstruct the original electronic record from the hash result produced by the algorithm;

(b) that two electronic records can produce the same hash result using the algorithm.

(3)   Any person by the use of a public key of the subscriber can verify the electronic record.

(4)   The private key and the public key shall be unique to the subscriber and constitute a functioning key pair.

CHAPTER III

ELECTRONIC GOVERNANCE

4.   Legal recognition of electronic records

Where any law provides that information or any other matter shall be in writing or in the typewritten or printed form, then, notwithstanding anything contained in such law, such requirement shall be deemed to have been satisfied if such information or matter is—

(a) rendered or made available in an electronic form; and

(b) accessible so as to be usable for a subsequent reference.

5. Legal recognition of digital signatures

Where any law provides that information or any other matter shall be authenticated by affixing the signature or any document should be signed or bear the signature of any person then, notwithstanding anything contained in such law, such requirement shall be deemed to have been satisfied, if such information or matter is authenticated by means of digital signature affixed in such manner as may be prescribed by the Federal Government.

Explanation.— For the purposes of this section, "signed", with its grammatical variations and cognate expressions, shall, with reference to a person, mean affixing of his hand written signature or any mark on any document and the expression "signature" shall be construed accordingly.

6. Use of electronic records and digital signatures in Government audits agencies

(1)   Where any law provides for—

(a)   the filing of any form, application or any other document with any office, authority, body or agency owned or controlled by the appropriate Government in a particular manner;

(b)   the issue or grant of any licence, permit, sanction or approval by whatever name called in a particular manner;

the receipt or payment of money in a particular manner,

then, notwithstanding anything contained in any other law for the time being in force, such requirement shall be deemed to have been satisfied if such filing, issue, grant, receipt or payment, as the case may be, is effected by means of such electronic form as may be prescribed by the appropriate Government.

(2)   The appropriate Government may, for the purposes of sub-section (1), by rules, prescribe—

(a)   the manner and format in which such electronic records shall be filed, created or issued;

(b)   the manner or method of payment of any fee or charges for filing, creation or issue any electronic record under clause (a).

7.   Retention of electronic records

(1)   Where any law provides that documents, records or information shall be retained for any specific period, then, that requirement shall be deemed to have been satisfied if such documents, records or information are retained in the electronic form, if—

(a)   the information contained therein remains accessible so as to be usable for a subsequent reference;

(b)   the electronic record is retained in the format in which it was originally generated, sent or received or in a format which can be demonstrated to represent accurately the information originally generated, sent or received;

(c)   the details which will facilitate the identification of the origin, destination, date and time of dispatch or receipt of such electronic record are available in the electronic record;

Provided that this clause does not apply to any information which is automatically generated solely for the purpose of enabling an electronic record to be dispatched or received.

(2)   Nothing in this section shall apply to any law that expressly provides for the retention of documents, records or information in the form of electronic records.

8.   Publication of rules. regulation, etc. in Electronic Gazette

Where any law provides that any rule, regulation, order, bye-law, notification or any other matter shall be published in the Official Gazette, then, such requirement shall be deemed to have been satisfied if such rule, regulation, order, bye-law, notification or any other matter is published in the Official Gazette in the electronic form;

Provided that where an Official Gazette is published both in the printed as well as in the electronic form, the date of publication shall be deemed to be the date of that Official Gazette which was first published in any form.

9.   **Sections 6. 7 and 8 not to confer right to insist document should be accepted in electronic form**

Nothing contained in sections 6, 7 and 8 shall confer a right upon any person to insist that any Ministry or Department of the Federal Government or the Provincial Government or any authority or body established by or under any law or controlled or funded by the Federal or Provincial Government should accept, issue, create, retain, preserve any document in the form of electronic records or effect any monetary transaction in the electronic form.

10.   **Power to make rules by Federal Government in respect of digital signature**

The Federal Government may, for the purposes of this Ordinance, by rules, prescribe—
(a)   the type of digital signature;

(b)   the manner and format in which the digital signature shall be affixed;

(c)   the manner or procedure which facilitates identification of the person affixing the digital signature;

(d)   control processes and procedures to ensure adequate integrity, security and confidentiality of electronic records or payments; and

(e)   any other matter which is necessary to give legal effect to digital signatures.

CHAPTER IV

ATTRIBUTION, ACKNOWLEDGMENT AND DISPATCH OF ELECTRONIC RECORDS

11.   Attribution of electronic records

An electronic record shall be attributed to the originator—

(a)   if it was sent by the originator himself;

(b)   by a person who had the authority to act on behalf of the originator in respect of that electronic record; or

(c)   by an information system programmed by or on behalf of the originator to operate automatically.

12.   Acknowledgment of Receipt

(1)   Where the originator has not agreed with the addressee that the acknowledgment be given in a particular form or by a particular method, an acknowledgment may be given by—

(a)   any communication by the addressee, automated or otherwise; or

(b)   any conduct of the addressee, sufficient to indicate to the originator that the electronic record has been received.

(2)   Where the originator has stipulated that the electronic record shall be binding only on receipt of an acknowledgment of such electronic record by him, then unless acknowledgment has been so received, the electronic record shall be deemed to have been never sent by the originator.

(3)   Where the originator has not stipulated that the electronic record shall be binding only on receipt of such acknowledgment, and the acknowledgment has not been received by the originator within the time specified or agreed or, if no time has been specified or agreed to within a reasonable time, then the originator may give notice to the addressee stating that no acknowledgment has been received by him and specifying a reasonable time by which the acknowledgment must be received by him and if no acknowledgment is received within the aforesaid time limit

he may after giving notice to the addressee, treat the electronic record as though it has never been sent.

13. Time and place of dispatch and receipt of electronic record

(1)   Save as otherwise agreed to between the originator and the addressee, the dispatch of an electronic record occurs when it enters a computer resource outside the control of the originator.

(2)   Save as otherwise agreed between the originator and the addressee, the time of receipt of an electronic record shall be determined as follows, namely:—

(a)   if the addressee has designated a computer resource for the purpose of receiving electronic records,—

(i)   receipt occurs at the time when the electronic record enters the designated computer resource; or

(ii)   if the electronic record is sent to a computer resource of the addressee that is not the designated computer resource, receipt occurs at the time when the electronic record is retrieved by the addressee;

(b)   if the addressee has not designated a computer resource along with specified timings, if any, receipt occurs when the electronic record enters the computer resource of the addressee.

(3)   Save as otherwise agreed between the originator and the addressee, an electronic record is deemed to be dispatched at the place where the originator has his place of business, and is deemed to be received at the place where the addressee has his place of business.

(4)   The provisions of sub-section (2) shall apply notwithstanding that the place where the computer resource is located may be different from the place where the electronic record is deemed to have been received under sub-section (3).

(5)   For the purposes of this section,—

(a)   if the originator or the addressee has more than one place of business, the principal place of business, shall be the place of business;

(b)   if the originator or the addressee does not have a place of business, his usual place of residence shall be deemed to be the place of business;

(c)   "usual place of residence", in relation to a body corporate, means the place where it is registered.

CHAPTER V

SECURE ELECTRONIC RECORDS AND SECURE DIGITAL SIGNATURES

14.   Secure electronic record

Where any security procedure has been applied to an electronic record at a specific point of time, then such record shall be deemed to be a secure electronic record from such point of time to the time of verification.

15.   Secure digital signature

If, by application of a security procedure agreed to by the parties concerned, it can be verified that a digital signature, at the lime it was affixed, was—

(a)   unique to the subscriber affixing it;

(b)   capable of identifying such subscriber;

(c)   created in a manner or using a means under the exclusive control of the subscriber and is linked to the electronic record to which it relates in such a manner that if the electronic record was altered the digital signature would be invalidated,

then such digital signature shall be deemed to be a secure digital signature.

16.   Security procedure

The Federal Government shall for the purposes of this Ordinance prescribe the security procedure having regard to commercial circumstances prevailing at the time when the procedure was used, including—

(a)   the nature of the transaction;

(b)   the level of sophistication of the parties with reference to their technological capacity;

(c)   the volume of similar transactions engaged in by other parties;

(d)   the availability of alternatives offered to but rejected by any party;

(e)   the cost of alternative procedures; and

(f)   the procedures in general use for similar types of transactions or communications.

CHAPTER VI

REGULATION OF CERTIFYING AUTHORITIES

17.   Appointment of Controller and other officers

(1)   The Federal Government may, by notification in the Official Gazette, appoint a Controller of Certifying Authorities for the purposes of this Ordinance and may also by the same or subsequent notification appoint such number of Deputy Controllers and Assistant Controllers as it deems fit.

(2)   The Controller shall discharge his functions under this Ordinance subject to the general control and directions of the Federal Government.

(3)   The Deputy Controllers and Assistant Controllers shall perform the functions-assigned to them by the Controller under the general superintendence and control of the Controller.

(4)   The head office of the Controller shall be at such place as the Federal Government may specify, and there may be established at such places as the Federal Government may think fit, branch offices of the Office of the Controller.

(5)   There shall be a seal of the Office of the Controller.

18. **Functions of Controller**

The Controller may perform all or any of the following functions, namely:—

(a)   exercising supervision over the activities of the Certifying Authorities;

(b)   laying down the standards to be maintained by the Certifying Authorities;

(c)   specifying the qualifications and experience which employees of the Certifying Authorities should possess;

(d)   specifying the conditions subject to which the Certifying Authorities shall conduct their business;

(e)   specifying the content of written printed or visual material and advertisements that may be distributed or used in respect of a Digital Signature Certificate and the Public Key;

(f)   specifying the form and content of a Digital Signature Certificate and the key;

(g)   specifying the form and manner in which accounts shall be maintained by the Certifying Authorities;

(h)   specifying the terms and conditions subject to which auditors may be appointed and the remuneration to be paid to them;

(i)   facilitating the establishment of any electronic system by a Certifying Authority either solely or jointly with other Certifying Authorities and regulation of such systems;

(j)   specifying the manner in which the Certifying Authorities shall conduct their dealings with the subscribers;

(k)   resolving any conflict of interests between the Certifying Authorities and the subscribers;

(l)   laying down the duties of the Certifying Authorities;

(m) maintaining a data-base containing of disclosure record of every Certifying Authority containing such particulars as may be specified by regulations, which shall be accessible to public.

19. Recognition of foreign Certifying Authorities

(1) Subject to such conditions and restrictions as may be specified by regulations, the Controller may with the previous approval of the Federal Government, and by notification in the Official Gazette, recognise any Certifying Authority as a Certifying Authority for the purposes of this Ordinance.

(2) Where any Certifying Authority is recognised under sub-section (1), the Digital Signature Certificate issued by such Certifying Authority shall be valid for the purposes of this Ordinance.

(3) The Controller may if he is satisfied that any Certifying Authority has contravened any of the conditions and restrictions subject to which it was granted recognition under sub-section (1) he may, for reasons to be recorded in writing, by notification in the Official Gazette, revoke such recognition.

20. Controller to act as repository

(1) The Controller shall be the repository of all Digital Signature Certificates issued under this Ordinance.

(2) The Controller shall—

(a) make use of hardware, software and procedures that are secure from instrusion and misuse;

(b) observe such other standards as may be prescribed by the Federal Government, to ensure that the secrecy and security of the digital signatures are assured.

(3) The Controller shall maintain a computerised data-base of all public keys in such a manner that such database and the public keys are available to any member of the public.

21. **Licence to issue Digital Signature Certificates**

(1)   Subject to the provisions of sub-section (2), any person may make an application, to the Controller, for a licence to issue Digital Signature Certificates.

(2)   No licence shall be issued under sub-section (7), unless the applicant fulfills such requirements with respect to qualification, expertise, manpower, financial resources and other infrastructure facilities, which are necessary to issue Digital Signature Certificates as may be prescribed by the Federal Government.

(3)   A licence granted under this section shall—
(a)   be valid for such period as may be prescribed by the Federal Government;

(b)   not be transferable or heritable;

(c)   be subject to such terms and conditions as may be specified by the regulations.

22. **Application for Licence**

(1)   Every application for issue of a licence shall be in such form as may be prescribed by the Federal Government .

(2)   Every application for issue of a licence shall be accompanied by-

(a)   a certification practice statement;

(b)   a statement including the procedures with respect to identification of the applicant;

(c)   payment of such fees, not exceeding twenty-five thousand rupees as may be prescribed by the Federal Government;

(d)   such other documents, as may be prescribed by the Federal Government.

23. **Renewal of Licence**

An application for renewal of a licence shall be—

(a)   in such form;

(b)   accompanied by such fees, not exceeding five thousand rupees, as may be prescribed by the Federal Government and shall be made not less than forty-five days before the date of expiry of the period of validity of the licence;

Provided that an application for the renewal of the licence made after the expiry of the licence may be entertained on payment of such late fee, not exceeding five hundred rupees, as may be prescribed.

24.   Procedure for grant or rejection of Licence

The Controller may, on receipt of an application under sub-section (1) of section grant of 21, after considering the documents accompanying the application and such other factors, as he deems fit, grant the licence or reject the application;

Provided that no application shall be rejected under this section unless the applicant has been given a reasonable opportunity of presenting his case.

25.   Suspension of Licence

(1)   The Controller may, if he is satisfied after making such inquiry, as he may think fit, that a Certifying Authority has,—

(a)   made a statement in, or in relation to, the application for the issue or renewal of the licence, which is incorrect or false in material particulars;

(b)   failed to comply with the terms and conditions subject to which the licence was granted;

(c)   failed to maintain the standards specified under clause (b) of sub-section (2) of section 20;

(d)   has contravened any provisions of this Ordinance, rule, regulation or order made the render. Revoke the licence;

Provided that no licence shall be revoked unless the Certifying Authority has been given a reasonable opportunity of showing cause against the proposed revocation.

(2)   The Controller may, if he has reasonable cause to believe that there is any ground for revoking a licence under sub-section (1), by order suspend such licence pending the completion of any enquiry ordered by him;

        Provided that no licence shall be suspended for a period exceeding ten days unless the Certifying Authority has been given a reasonable opportunity of showing cause against the proposed suspension.

(3)   No Certifying Authority whose license has been suspended shall issue any Digital Signature Certificate during such suspension.

26.   Notice of suspension or revocation of licence

(1)   Where the licence of the Certifying Authority is suspended or revoked, the Controller shall publish notice of such suspension or revocation, as the case may be, in the data-base maintained by him.

(2)   Where one or more repositories are specified, the Controller shall publish notices of such suspension or revocation, as the case may be, in all such repositories.

27.   Power to delegate

        The Controller may, in writing, authorise the Deputy Controller, Assistant Controller or any officer to exercise any of the powers of the Controller under this Chapter.

28.   Power to investigate contraventions

(1)   The Controller or any officer authorised by him in this behalf shall take up for investigation any contravention of the provisions of this Ordinance, rules or regulations made thereunder.

(2)   The Controller or any officer authorised by him in this behalf shall exercise the like powers which are conferred on Income-tax authorities under Chapter XIII of the Income-tax Ordinance, 1979 (XXXI of 1979) and shall exercise such powers, subject to such limitations laid down under that Ordinance.

29.   Access to computers and data

(1)   Without prejudice to the provisions of sub-section (2) of section 68, the Controller or any person authorised by him shall, if he has reasonable cause to suspect that any contravention of the provisions of this Ordinance, rules or regulations made thereunder has been committed, have access to any computer system, any apparatus, data or any other material connected with such system, for the purpose of searching or causing a search to be made for obtaining any information or data contained in or available to such computer system.

(2)   For the purposes of sub-section (1), the Controller or any person authorised by him may, by order, direct any person incharge of, or otherwise concerned with :he operation of, the computer system, data apparatus or material, to provide him with such reasonable technical and other assistant... as he may consider necessary.

30.   Certifying Authority to follow certain procedures

Every Certifying Authority shall.—

(a)   make use of hardware, software, and procedures that are secure from intrusion and misuse:

(b)   provide a reasonable level of reliability in its .services which are reasonably suited to the performance of intended functions;

(c)   adhere to security procedures to ensure that the secrecy and privacy of the digital signatures are assured; and

(d)   observe such other standards as may be specified by regulations.

31.   Certifying Authority to ensure compliance of the Ordinance, etc

Every Certifying Authority shall ensure that every person employed or otherwise engaged by it complies, in the course of his employment or engagement, with the provisions of this Ordinance, rules, regulations and orders made the reunder.

32.   Display of licence

Every Certifying Authority shall display its licence at a conspicuous place of the premises in which it carries on its business.

33.   Surrender of licence

Every Certifying Authority whose licence is suspended or revoked shall immediately after such suspension or revocation, surrender the licence to the Controller.

34.   Disclosure

(1)   Every Certifying Authority shall disclose in the manner specified by regulations—

(a)   its Digital Signature Certificate which contains the public key corresponding to the private key used by that Certifying Authority to digitally sign another Digital Signature Certificate;

(b)   any certification practice statement relevant thereto;

(c)   notice of die revocation or suspension of its Certifying Authority certificate, if any; and

(d)   any other fact that materially and adversely affects either the reliability of a Digital Signature Certificate, which that Authority has issued, or the Authority's ability to perform its services.

(2)   Where in the opinion of the Certifying Authority any event has occurred or any situation has arisen which may materially and adversely affect the integrity of its computer system or the conditions subject to which a Digital Signature Certificate was granted, then, the Certifying Authority shall—

(a)   use reasonable efforts to notify any person who is likely to be affected by that occurrence; or

(b)   act in accordance with the procedure specified in its certification practice statement to deal with such event or situation.

CHAPTER VII

DIGITAL SIGNATURE CERTIFICATES

35.   Certifying Authority to issue Digital Signature Certificate

(1)   Any person may make an application to the Certifying Authority for the issue of a Digital Signature Certificate in such form as may be prescribed by the Federal Government.

(2)   Every such application shall be accompanied by such fee not exceeding twenty-five thousand rupees as may be prescribed by the Federal Government, to be paid to the Certifying Authority;

Provided that while prescribing fees under sub-section (2) different fees may be prescribed for different classes of applicants.

(3)   Every such application shall be accompanied by a certification practice statement or where there is no such statement, a statement containing such particulars, as may be specified by regulations.

(4)   On receipt of an application under sub-section (1), the Certifying Authority may, after consideration of the certification practice statement or the other statement under sub-section (3) and after making such enquiries as it may deem fit, grant the Digital Signature Certificate or for reasons to be recorded in writing, reject the application;

Provided that no Digital Signature Certificate shall be granted unless the Certifying Authority is satisfied that—

(a)   the applicant holds the private key corresponding to the public key to be listed in the Digital Signature Certificate;

(b)   the applicant holds a private key, which is capable of creating a digital signature;

(c)   the public key to be listed in the certificate can be used to verify a digital signature affixed by the private key held by the applicant;

Provided further that no application shall be rejected unless the applicant has been given a reasonable opportunity of showing cause against the proposed rejection.

36. Representations upon issuance of Digital Signature Certificate

A Certifying Authority while issuing a Digital Signature Certificate shall certify that—

(a)   it has complied with the provisions of this Ordinance and the rules and   regulations made thereunder;

(b)   it has published the Digital Signature Certificate or otherwise made it available to such person relying on it and the subscriber has accepted it;

(c)   the subscriber holds the private key corresponding to the public key, listed in the Digital Signature Certificate;

(d)   the subscriber's public key and private key constitute a functioning key pair;

(e)   the information contained in the Digital Signature Certificate is accurate; and

(f)   it has no knowledge of any material fact, which if it had been included in the Digital Signature Certificate would adversely affect the reliability of the representations made in clauses (a) to (d).

37. Suspension of Digital Signature Certificate

(1)   Subject to the provisions of sub-section (2), the Certifying Authority which has issued a Digital Signature Certificate may suspend such Digital Signature Certificate,—

(a)   on receipt of a request to that effect from —

(i)   the subscriber listed in the Digital Signature Certificate; or

(ii)   any person duly authorised to act on behalf of that subscriber;

(b)   if it is of opinion that the Digital Signature Certificate should be suspended in public interest.

(2)   A Digital Signature Certificate shall not be suspended for a period exceeding fifteen days unless the subscriber has been given an opportunity of being heard in the matter.

(3)   On suspension of a Digital Signature Certificate under this section, the Certifying Authority shall communicate the same to the subscriber.

38.   Revocation of Digital Signature Certificate

(1)   A Certifying Authority may revoke a Digital Signature Certificate issued by it—

(a)   where the subscriber or any other person authorised by him makes a request to that effect; or

(b)   upon the death of the subscriber; or

(c)   upon the dissolution of the firm or winding up of the company where the subscriber is a firm or a company.

(2)   Subject to the provisions of sub-section (3) and without prejudice to the provisions of sub-section (1), a Certifying Authority may revoke a Digital Signature Certificate which has been issued by it at any time, if it is of opinion that—

(a)   a material fact represented in the Digital Signature Certificate is false or has been concealed;

(b)   a requirement for issuance of the Digital Signature Certificate was not satisfied;

(c)   the Certifying Authority's private key or security system was compromised in a manner materially affecting the Digital Signature Certificate's reliability;

(d)   the subscriber has been declared insolvent or dead or where a subscriber is a firm or a company and it has been dissolved, wound-up or otherwise ceased to exist.

(3)   A Digital Signature Certificate shall not be revoked unless the subscriber has been given an opportunity of being heard in the matter.

(4)   On revocation of a Digital Signature Certificate under this section, the Certifying Authority shall communicate the same to the subscriber.

39.   Notice of suspension or revocation

(1)   Where a Digital Signature Certificate is suspended or revoked under section 37 or section 38, the Certifying Authority shall publish a notice of such suspension or revocation, as the case may be, in the repository specified in the Digital Signature Certificate for publication of such notice.

(2)   Where one or more repositories are specified, the Certifying Authority shall publish notices of such suspension or revocation, as the case may be, in all such repositories.

CHAPTER VIII

DUTIES OF SUBSCRIBERS

40.   Generating key pair

Where any Digital Signature Certificate, the public key of which corresponds to the private key of that subscriber which is to be listed in the Digital Signature Certificate, has been accepted by a subscriber, then the subscriber shall generate the key pair by applying the security procedure.

41.   Acceptance of Digital Signature Certificate

(1)   A subscriber shall be deemed to have accepted a Digital Signature Certificate if he publishes or authorizes the publication of a Digital Signature Certificate—

(a)   to one or more persons;

(b)   in a repository, or otherwise demonstrates his approval of the Digital Signature Certificate in any manner.

(2)   By accepting a Digital Signature Certificate the subscriber certifies to all who reasonably rely on the information contained in the Digital Signature Certificate that—

(a)   the subscriber holds the private key corresponding to the public key listed in the Digital Signature Certificate and is entitled to hold the same;

(b)   all representations made by the subscriber to the Certifying Authority and all material relevant to the information contained in the Digital Signature Certificate are true;

(c)   all information in the Digital Signature Certificate that is within the knowledge of the subscriber is true.

42.   Control of private key

(1)   Every subscriber shall exercise reasonable care to retain control of the private key corresponding to the public key listed in his Digital Signature Certificate and take all steps to prevent its disclosure to a person not authorised to affix the digital signature of the subscriber.

(2)   If the private key corresponding to the public key listed in the Digital Signature Certificate has been compromised, then, the subscriber shall communicate the same without any delay to the Certifying Authority.

CHAPTER IX

PENALTIES AND ADJUDICATION

43.   Penalty for damage to computer, computer system, etc

If any person without permission of the owner or any other person who is incharge of a computer, computer system or computer network,—

(a)   accesses or secures access to such computer, computer system or computer network.

(b)   downloads, copies or extracts any data, computer data base or information from such computer, computer system or computer network including information or data held or stored in any removable storage medium;

(c)   introduces or causes to be introduced any computer contaminant or computer virus into any computer, computer system or computer network;

(d)   damages or causes to be damaged any computer, computer system or   computer network, data, computer data base or any other programmes residing in such computer, computer system or computer network;

(e)   disrupts or causes disruption of any computer, computer system or computer network;

(f)   denies or causes the denial of access to any person authorised to access any computer, computer system or computer network by any means;

(g)   provides any assistance to any person to facilitate access to a computer, computer system or computer network in contravention of the provisions of this Ordinance, roles or regulations made thereunder;

(h)   charges the services availed of by a person to the account of another person by tampering with or manipulating any computer, computer system, or computer network, he shall be liable to pay damages by way of compensation not exceeding one million rupees to the person so affected.

Explanation.— For the purposes of this section,—

(i)   "computer contaminant" means any set of computer instructions that are designed—

(a)   to modify, destroy, record, transmit data or programme residing within a computer, computer system or computer network; or

(b)   by any means to usurp the normal operation of the computer, computer system, or computer network;

(ii)   "computer database" means a representation of information, knowledge, facts, concepts or instructions in text, image, audio, video that are being prepared or have been prepared in a formalised manner or have been produced by a computer, computer system or computer network and are intended for use in a computer, computer system or computer network;

(iii)   "computer virus" means any computer instruction, information, data or programme mat destroys, damages, degrades or adversely affects the performance of a computer resource or attaches itself to another computer resource and operates when a programme, data or instruction is executed or some other event takes place in that computer resource;

(iv)   "damage" means to destroy, alter, delete, add, modify or rearrange any computer resource by any means.

44.   Penalty for failure to furnish information, return, etc

If any person who is required under this Ordinance or any rules or regulations made thereunder to—

(a)   furnish any document, return or report to the Controller or the Certifying Authority fails to furnish the same, he shall be liable to a penalty not exceeding one hundred and fifty thousand rupees for each such failure;

(b)   file any return or furnish any information, books or other documents within the time specified therefor in the regulations fails to file return or furnish the same within the time specified therefore in the regulations, he shall be liable to a penalty not exceeding five thousand rupees for every day during which such failure continues;

(c)   maintain books of account or records fails to maintain the same, he shall be liable to a penalty not exceeding ten thousand rupees for every day during which the failure continues.

45.   Residuary penalty

Whoever contravenes any rules or regulations made under this Ordinance, for the contravention of which no penalty has been separately provided, shall be liable to pay a compensation not exceeding twenty-five thousand rupees to the person affected by such contravention.

46.   Power to adjudicate

(1)   For the purpose of adjudging under this Chapter whether any person has committed a contravention of any of the provisions of this Ordinance or of any rule, regulation, direction or order made thereunder the Federal

Government shall, subject to the provisions of sub-section (3), appoint any officer not below the rank of a Director to the Government of Pakistan or an equivalent officer of a Provincial Government to be an adjudicating officer for holding an inquiry in the manner prescribed by the Federal Government. After giving the person referred to in sub-section (1) a reasonable opportunity for making representation in the matter and if, on such inquiry, he is satisfied that the person has committed the contravention, he may impose such penalty as he thinks fit in accordance with the provisions of that section.

(2)   No person shall be appointed as an adjudicating officer unless he possesses such legal or judicial experience as may be prescribed by the Federal Government.

(3)   Where more than one adjudicating officers are appointed, the Federal Government shall specify by order the matters and places with respect to which such officers shall exercise their jurisdiction.

(4)   Every adjudicating officer shall have the powers of a civil court which are conferred on the Cyber Appellate Tribunal under sub-section (2) of section 58, and—

(a)   all proceedings before it shall be deemed to be judicial proceedings within the meaning of sections 193 and 228 of the Pakistan Penal Code;

(b)   shall be deemed to be a civil court for the purposes of sections 345 and 346 of the Code of Criminal Procedure, 1898.

47.   Factors to be taken into account by the adjudicating officer

While adjudging the quantum of compensation under this Chapter the adjudicating officer shall have due regard to the following factors, namely;—

(a)   the amount of gain of unfair advantage, wherever quantifiable, made as a result of the default;

(b)   the amount of loss caused to any person as a result of the default;

(c)   the repetitive nature of the default.

CHAPTER X

THE CYBER REGULATIONS APPELLATE TRIBUNAL

48.   Establishment of Cyber Appellate Tribunal

(1)   The Federal Government shall, by notification, establish one or more appellate tribunals to be known as the Cyber Regulations Appellate Tribunal.

(2)   The Federal Government shall also specify, in the notification referred to in sub-section (1), the matters and places in relation to which the Cyber Appellate Tribunal may exercise jurisdiction.

49.   Composition of Cyber Appellate Tribunal

A Cyber Appellate Tribunal shall consist of one person only (hereinafter referred to as the Presiding Officer of the Cyber Appellate Tribunal) to be appointed, by notification, by the Federal Government after consultations with the Chief Justice of Pakistan.

50.   Qualification for appointment   as Presiding Officer of the Cyber Appellate Tribunal.

A person shall not be qualified for appointment as the Presiding Officer of a Cyber Appellate Tribunal unless he is, or has been, or is qualified to be, a Judge of a High Court; or

51.   Term of office

The Presiding Officer of a Cyber Appellate Tribunal shall hold office until he attains the age of sixty-five years.

52.   Salary, allowance and other terms and conditions of service of Presiding Officer

The salary and allowances payable to and the other terms and conditions of service including pension, gratuity and other retirement benefits of, the Presiding Officer of a Cyber Appellate Tribunal shall be such as may be prescribed;

Provided that neither the salary and allowances nor the other terms and conditions of service of the Presiding Officer shall be varied to his disadvantage after appointment.

53. Filling up of vacancies

If, for reason other than temporary absence, any vacancy occurs in the office of the Presiding Officer of a Cyber Appellate Tribunal, then the Federal Government shall appoint another person in accordance with the provisions of this Ordinance to fill the vacancy and the proceedings may be continued before the Cyber Appellate Tribunal from the stage at which the vacancy is filled.

54. Resignation and removal

(1)   The Presiding Officer of a Cyber Appellate Tribunal may, by notice in writing under his hand addressed to the Federal Government, resign his office;

Provided that the said Presiding Officer shall, unless he is permitted by the Federal Government to relinquish his office sooner, continue to hold office until the expiry of three months from-the date of receipt of such notice or until a person duly appointed as his successor enters upon his office or until the expiry of his term of office, whichever is the earliest.

(2)   The Presiding Officer of a Cyber Appellate Tribunal shall not be removed from his office except by an order by the Federal Government on the ground of proved misbehaviour or incapacity after an inquiry made by a Judge of the Supreme Court in which the Presiding Officer concerned has been informed of the charges against him and given a reasonable opportunity of being heard in respect of these charges.

(3)   The Federal Government may, by rules, regulate the procedure for the investigation of misbehaviour or incapacity of the aforesaid Presiding Officer.

55. Orders constituting Cyber Appellate Tribunal to be final and not to invalidate its proceedings.

No order of the Federal Government appointing any person as the Presiding Officer of a Cyber Appellate Tribunal shall be called in question in any manner and no act or proceeding before a Cyber

Appellate Tribunal shall be called in question in any manner on the ground merely of any defect in the constitution of a Cyber Appellate Tribunal.

56.   Staff of the Cyber Appellate Tribunal

(1)   The Federal Government shall provide the Cyber Appellate Tribunal with such officers and employees as that Government may think fit.

(2)   The officers and employees of the Cyber Appellate Tribunal shall discharge their functions under general superintendence of the Presiding Officer.

(3)   The salaries and allowances and other conditions of service of the officers and employees of the Cyber Appellate Tribunal shall be such as may be prescribed by the Federal Government.

57.   Appeal to Cyber Regulations Appellate Tribunal

(1)   Save as provided in sub-section (2), any person aggrieved by an order made by an adjudicating officer under this Ordinance may prefer an appeal to a Cyber Appellate Tribunal having jurisdiction in the matter.

(2)   No appeal shall lie to the Cyber Appellate Tribunal from an order made by an adjudicating officer with the consent of the parties.

(3)   Every appeal under sub-section (1) shall be filed within a period of forty-five days from the date on which a copy of the order made by the adjudicating officer is received by the person aggrieved and it shall be in such form and be accompanied by such fee as may be prescribed: Provided that the Cyber Appellate Tribunal may entertain an appeal after the expiry of the said period of forty-five days if it is satisfied that there was sufficient cause for not filing it within that period.

(4)   On receipt of an appeal under sub-section (1), the Cyber Appellate Tribunal may, after giving the parties to the appeal, an opportunity of being heard, pass such orders thereon as it thinks fit, confirming, modifying or setting aside the order appealed against.

(5)   The Cyber Appellate Tribunal shall send a copy of every order made by it to the parties to the appeal and to the concerned adjudicating officer.

(6)   The appeal filed before the Cyber Appellate Tribunal under sub-section (1) shall be dealt with by it as expeditiously as possible and endeavour shall be made by it to dispose of the appeal finally within six months from the date of receipt of the appeal.

58.   Procedure and powers of the Cyber Appellate Tribunal

(1)   The Cyber Appellate Tribunal shall not be bound by the procedure laid down by the Code of Civil Procedure, 1908 but shall be guided by the principles of natural justice and, subject to the other provisions of this Ordinance and of any roles, the Cyber Appellate Tribunal shall have powers to regulate its own procedure including the place at which it shall have its sittings.

(2)   The Cyber Appellate Tribunal shall have, for the purposes of discharging their functions under this Ordinance, the same powers as are vested in a civil court under the Code of Civil Procedure, 1908, while trying a suit, in respect of the following matters, namely:—

(a)   summoning and enforcing the attendance of any person and examining him on oath;

(b)   requiring the discovery and production of documents or other electronic records;

(c)   receiving evidence on affidavits;

(d)   issuing commissions for the examination of witnesses or documents;

(e)   reviewing its decisions;

(f)   dismissing an application for default or deciding it expane;

(g)   any other matter which may be prescribed.

(3)   Every proceeding before the Cyber Appellate Tribunal shall be deemed .to be a judicial proceeding within the meaning of sections 193 arid 228, and for the purposes of section 196 of the Pakistan Penal Code and the Cyber Appellate Tribunal shall be deemed to be a civil court for the purposes of section 195 and Chapter XXXV of the Code of Criminal Procedure, 1898.

59. **Right to legal representation**

The appellant may either appear in person or authorise one or more legal practitioners or any of its officers to present his or its case before the Cyber Appellate Tribunal Limitation.

60. **Limitation**

The provisions of the Limitation Act 1908, shall, as far as may be, apply to an appeal made to the Cyber Appellate Tribunal.

61. **Civil court not to have jurisdiction**

No court shall have jurisdiction to entertain any suit or proceeding in respect of any matter which an adjudicating officer appointed under this Ordinance or the Cyber Appellate Tribunal constituted under this Ordinance is empowered by or under this Ordinance to determine and no injunction shall be granted by any court or other authority in respect of any action taken or to be taken in pursuance of any power conferred by or under this Ordinance.

62. **Appeal to High Court**

Any person aggrieved by any decision or order of the Cyber Appellate Tribunal may file an appeal to the High Court within sixty days from the date of communication of the decision or order of the Cyber Appellate Tribunal to him on any question of fact or law arising out of such order;

Provided that the High Court may, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal within the said period, allow it to be filed within a further period not exceeding sixty days.

63. **Compounding of contraventions**

(1) Any contravention under this Chapter may, either before or after the institution of adjudication proceedings, be compounded by the Controller or such other officer as may be specially authorized by him in this behalf or by the adjudicating officer, as the case may be, subject to such conditions as the Controller or such other officer or the adjudicating officer may specify;

Provided that such sum shall not, in any case, exceed the maximum amount of the penalty which may be imposed under this Ordinance for the contravention so compounded.

(2)   Nothing in sub-section (1) shall apply to a person who commits the same or similar contravention within a period of three years from the date on which the first contravention, committed by him, was compounded.

Explanation.—For the purposes of this sub-section, any second or subsequent contravention committed after the expiry of a period of three years from the date on which the contravention was previously compounded shall be deemed to be a first contravention.

(3)   Where any contravention has been compounded under sub-section (1), no proceeding or further proceeding, as the case may be, shall be taken against the person guilty of such contravention in respect of the contravention so compounded.

64.   Recovery of penalty

A penalty imposed under this Ordinance, if it is not paid, shall be recovered   as an arrear of land revenue and the licence or the Digital Signature   Certificate, as the case may be, shall be suspended till the penalty is paid.

CHAPTER XI

OFFENCES

65.   Tampering with computer source documents

Whoever knowingly or intentionally conceals, destroys or alters or intentionally or knowingly causes another to conceal, destroy or alter any computer source code used for a computer, computer programme, computer system or computer network, when the computer source code is required to be kept or maintained by law for the time being in force, shall be punishable with imprisonment up to three years, or with fine which may extend up to two hundred thousand rupees, or with both.

Explanation.—For the purposes of this section, "computer source code" means the listing of programmes, computer Commands, design and layout and programme analysis of computer resource in any form.

66. Publishing of information which is obscene in electronic form

Whoever publishes or transmits or causes to be published in the electronic form, any material which is lascivious or appeals to the prurient interest or if its effect is such as to tend to deprave and corrupt persons who are likely, having regard to all relevant circumstances, to read, see or hear the matter contained or embodied in it, shall be punished on first conviction with imprisonment of either description for a term which may extend to two years and with fine which may extend to fifty thousand rupees and in the event of a second or subsequent conviction with imprisonment of either description for a term which may extend to five years and also with fine which may extend to one hundred thousand rupees.

67. Power of the Controller to give directions

(1)   The Controller may, by order, direct a Certifying Authority or any employee of such Authority to take such measures or cease carrying on such activities as specified in the order if those are necessary to ensure compliance with the provisions of this Ordinance, rules or any regulations made thereunder.

(2)   Any person who fails to comply with any order under sub-section (1) shall be guilty of an offence and shall be liable on conviction to imprisonment for a term not exceeding three years or to a fine not exceeding two hundred thousand rupees or to both.

68. Directions of Controller to a subscriber to extend facilities to decrypt information

(1)   If the Controller is satisfied that it is necessary or expedient so to do in the interest of the sovereignty or integrity of Pakistan, the security of the State, friendly relations with foreign States or public order or for preventing incitement to the commission of any cognizable offence, for reasons to be recorded in writing, by order, direct any agency of the Government to intercept any information transmitted through any computer resource.

(2)   The subscriber or any person incharge of the computer resource shall, when called upon by any agency which has been directed under sub-section (1), extend all facilities and technical assistance to decrypt the information.

(3)   The subscriber or any person who fails to assist the agency referred to in sub-section (2) shall be punished with an imprisonment for a term which may extend to seven years.

69.   Protected system

(1)   The appropriate Government may, by notification in the Official Gazette, declare that any computer, computer system or computer network to be a protected system.

(2)   The appropriate Government may, by order in writing, authorize the persons who are authorized to access protected systems notified under sub-section (1).

(3)   Any person who secures access or attempts to secure access to a protected system in contravention of the provisions of this section shall be punished with imprisonment of either description for a term which may extend to ten years and shall also be liable to fine.

70.   Penalty for misrepresentation

Whoever makes any misrepresentation to, or suppresses any material fact from, the Controller or the Certifying Authority for obtaining any licence or Digital Signature Certificate, as the case may be, shall be punished with imprisonment for a term which may extend to two years, or with fine which may extend to one hundred thousand rupees, or with both.

71.   Breach of confidentiality and privacy

Save as otherwise provided in this Ordinance or any other law for the time being in force, any person who, in pursuant of any of the powers conferred under this Ordinance, rules or regulations made thereunder, has secured access to any electronic record, book, register, correspondence, information, document or other material without the consent of the person concerned discloses such electronic record, book, register, correspondence, information, document or other material to

any other person shall be punished with imprisonment for a term which may extend to two years, or with fine which may extend to one hundred thousand rupees, or with both.

72.   Penalty for publishing Digital Signature Certificate false in certain particulars

(1)   No person shall publish a Digital Signature Certificate or otherwise make it available to any other person with the knowledge that—

(a)   the Certifying Authority listed in the certificate has not issued it; or

(b)   the subscriber listed in the certificate has not accepted it; or

(c)   the certificate has been revoked or suspended, unless such publication is for the purpose of verifying a digital signature created prior to such suspension or revocation.

(2)   Any person who contravenes the provisions of sub-section (1) shall be punished with imprisonment for a term which may extend to two years, or with fine which may extend to one hundred thousand rupees, or with both.

73.   Publication for fraudulent purpose

73.   Whoever knowingly creates, publishes or otherwise makes available a Digital publication for Signature Certificate for any fraudulent or unlawful purpose shall be punished with imprisonment for a term which may extend to two years, or with fine which may extend to one hundred thousand rupees, or with both.

74.   Ordinance to apply for offense or contraventions committed outside Pakistan.

(1)   Subject to the provisions of sub-section (2), the provisions of this Ordinance shall apply also to any offence or contravention committed outside Pakistan by any person irrespective of his nationality.

(2)   For the purposes of sub-section (1), this Ordinance shall apply to an offence or contravention committed outside Pakistan by any person if the act or conduct constituting the offence or contravention involves a computer, computer system or computer network located in Pakistan.

75.   Confiscation

Any computer, computer system, floppies, compact disks, tape drives or any other accessories related thereto, in respect of which any provision of this Ordinance, rules, orders or regulations made thereunder has been or is being contravened, shall be liable to confiscation;

Provided that where it is established to the satisfaction of the court adjudicating the confiscation that the person in whose possession, power or control of any such computer, computer system, floppies, compact disks, tape drives or any other accessories relating thereto is found is not responsible for the contravention of the provisions of this Ordinance, rules, orders or regulations made thereunder, the court may, instead of making an order for confiscation of such computer, computer system, floppies, compact disks, tape drives or any other accessories related thereto, make such other order authorised by this Ordinance against the person contravening of the provisions of this Ordinance, rules, orders or regulations made thereunder as it may think fit.

76.   Penalties and confiscation not to interfere with other punishments

No penalty imposed or confiscation made under this Ordinance shall prevent the imposition of any other punishment to which the person affected thereby is liable under any other law for the time being in force.

77.   Power to investigate offences

Notwithstanding anything contained in the Code of Criminal Procedure, 1898, a police officer not below the rank of Deputy Superintendent of Police shall investigate any offence under this Ordinance.

CHAPTER XII

NETWORK SERVICE PROVIDERS NOT TO BE LIABLE IN CERTAIN CASES

78.   Network service providers not to be reliable in certain cases

For the removal of doubts, it is hereby declared that no person providing any service as a network service provider shall be liable under

this Ordinance, rules or regulations made thereunder for any third party information or data made available by him if he proves that the offence or contravention was committed without his knowledge or that he had exercised all due diligence to prevent the commission of such offence or contravention.

Explanation.— For the purposes of this section,—

(a)   "network service provider" means an intermediary;

(b)   "third party information" means any information dealt with by a network service provider in his capacity as an intermediary.

CHAPTER XIII

MISCELLANEOUS

79.   Power of police officer and other officers to enter, search, etc

(1)   Notwithstanding anything contained in the Code of Criminal Procedure, 1898, any police officer, not below the rank of a Deputy Superintendent of Police, or any other officer of the Federal Government or a Provincial Government authorised by the Federal Government in this behalf may enter any public place and search and arrest without warrant any person found therein who is reasonably suspected or having committed or of committing or of being about to commit any offence under this Ordinance.

Explanation.—For the purposes of this sub-section, the expression "public place" includes any public conveyance, any hotel, any shop or any her place intended for use by, or accessible to the public.

(2)   Where any person is arrested under sub-section (1) by an officer other than a police officer, such officer shall, without unnecessary delay, take or send the person arrested before a magistrate having jurisdiction in the case or before the officer-in-charge of a police station.

(3)   The provisions of the Code of Criminal Procedure, 1973 shall, subject to the 2 of 1974. provisions of this section, apply, so far as may be, in relation to any entry, search or arrest, made under this section.

80.	**Ordinance to have overriding effect**

The provisions of this Ordinance shall have effect notwithstanding anything inconsistent therewith contained in any other law for the time being in force.

81.	**Controllers to be public servants**

The Presiding Officer and other officers and employees of a Cyber Appellate Tribunal, the Controller, the Deputy Controller and the Assistant Controllers shall be deemed to be public servants within the meaning of section 21 of the Pakistan Penal Code I860.

82.	**Power to give directions**

The Federal Government may give directions to the Government of a Province as to the carrying into execution in the Province of any of the provisions of this Ordinance

83.	**Protection of action taken in good faith**

No suit, prosecution or other legal proceeding shall lie against the Federal Government, the Provincial Government, the Controller or any person acting on behalf of him, the Presiding Officer, adjudicating officers and the staff of the Cyber Appellate Tribunal for anything which is in good faith done or intended to be done in pursuance of this Ordinance or any rule, regulation or order made thereunder.

84.	**Offences by companies**

(1)	Where a person committing a contravention of any of the provisions of this Ordinance or of any rule, direction or order made thereunder is a company, every principal office of the company who, at the time the contravention was committed, was in charge of, and was responsible to, the company for the conduct of business of the company as well as the company, shall be guilty of the contravention and shall be liable to be proceeded against and punished accordingly;

Provided that nothing contained in this sub-section shall render any such person liable to punishment if he proves that the contravention took place without his knowledge or that he exercised all due diligence to prevent such contravention.

(2)   Notwithstanding anything contained in sub-section (1), where a contravention of any of the provisions of this Ordinance or of any rule, direction or order made thereunder has been committed by a company and it is proved that the contravention has taken place with the consent or connivance of, or is attributable to any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of the contravention and shall be liable to be proceeded against and punished accordingly.

Explanation,—   For the purposes of this section,—

(i)   "company" means any body corporate and includes a firm or other association of individuals; and

(ii)   "director", in relation to a firm, means a partner in the firm.

85.   Removal of difficulties

(1)   If any difficulty arises in giving effect to the provisions of this Ordinance, the Federal Government may, by order published in the Official Gazette, make such provisions not inconsistent with the provisions of this Ordinance as appear to it to be necessary or expedient for removing the difficulty;

Provided that no order shall be made under this section after the expiry of a period of two years from the commencement of this Ordinance.

(2)   Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament.

86.   Power of Federal Government to make rules

(1)   The Federal Government may, by notification in the Official Gazette, make rules to carry out the provisions of this Ordinance.

(2)   In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(a)   the manner in which any information or matter may be authenticated by means of digital signature under section 5;

(b)   the electronic form in which filing, issue, grant or payment shall be effected under sub-section (1) of section 6;

(c)   the manner and format in which electronic records shall be filed, created or issued and the method of payment under sub-section (2) of section 6;

(d)   the matters relating to the type of digital signature, manner and format in which it may be affixed under section 10;

(e)   the security procedure for the purpose of creating secure electronic record and secure digital signature under section 16;

(f)   other standards to be observed by-the Controller under Clause (b) of sub-section (2) of section 20;

(g)   the requirements which an applicant must fulfil under sub-section (2) of section 21;

(h)   the period of validity of licence granted under clause (a) of sub-section (J) of section 21;

(i)   the form in which an application for licence may be made under subsection (I) of section 22;

(j)   the amount of fees payable under clause (c) of sub-section (2) of section 22;

(k)   such other documents which shall accompany an application for licence under clause (d) of sub-section (2) of section 22;

(l)   the form and the fee for renewal of a licence and the fee payable thereof under section 23;

(m)   the amount of late fee payable under the proviso to section 23;

(n)   the form in which application for issue of a Digital Signature Certificate may be made under sub-section (1) of section 35;

(o)   the fee to be paid to the Certifying Authority for issue of a Digital Signature Certificate under sub-section Q) of section 35;

(p)   the manner in which the adjudicating officer shall hold inquiry under sub-section (/) of section 46;

(q)   the qualification and experience which the adjudicating officer shall possess under sub-section (2) of section 46;

(r)   the salary, allowances and the other terms and conditions of service of the Presiding Officer under section 52;

(s)   the procedure for investigation of misbehaviour or incapacity of the Presiding Officer under sub-section (3) of section 54;

(t)   the salary and allowances and other conditions, of service of other officers and employees under sub-section (3) of section 56;

(u)   the form in which appeal may be filed and the fee thereof under subsection (3) of section 57;

(v)   any other power of a civil court required to be prescribed under clause (g) of sub-section (2) of section 58; and

(w)   any other matter which is required to be, or may be, prescribed.

(3)   Every notification made by the Federal Government under clause (1) of subsection (4) of section 1 and every rule made by it shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the notification or the rule or both Houses agree that the notification or the rule should not be made, the notification or the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that notification or role.

87.   Constitution of Advisory Committee

(1)   The Federal Government shall, as soon as may be after the commencement of this Ordinance, constitute a Committee called the Cyber Regulations Advisory Committee.

(2)   The Cyber Regulations Advisory Committee shall consist of a Chairperson and such number of other official and non-official members representing the interests principally affected or having special knowledge of the subject-matter as the Federal Government may deem fit.

(3)   The Cyber Regulations Advisory Committee shall advise—

(a)   the Federal Government either generally as regards any rules or for any other purpose connected with this Ordinance;

(b)   the Controller in framing the regulations under this Ordinance.

(4)   There shall be paid to the non-official members of such Committee such traveling and other allowances as the Federal Government may fix.

88.   Power of Controller to make regulations

(1)   The Controller may, after consultation with the Cyber Regulations Advisory Committee and with the previous approval of the Federal Government, by notification in the Official Gazette, make regulations consistent with this Ordinance and the rules made thereunder to carry out the purposes-of this Ordinance .

(2)   In particular, and without prejudice to the generality of the foregoing power, such regulations may provide for all or any of the following matters, namely:—

(a)   the particulars relating to maintenance of data-base containing the disclosure record of every Certifying Authority under clause (m) of section 18;

(b)   the conditions and restrictions subject to; which the Controller may recognise any foreign Certifying Authority under sub-section (1) of section 19;

(c)   the terms and conditions subject to which a licence may be granted under clause (c) of sub-section (3) of section 21;

(d)   other standards to be observed by a Certifying. Authority under clause (d) of section 30;

(e)   the manner in which the Certifying Authority shall disclose the matters specified in sub-section (7) of section 34;

the particulars of statement which shall accompany an application under sub-section (3) of section 35.

89.   Power of Provincial Government to make rules

(1)   The Provincial Government may, by notification in the Official Gazette, make rules to carry out the provisions of this Ordinance.

(2)   In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(a)   the electronic form in which filing, issue, grant receipt or payment shall be effected under sub-section (1) of section 6;

(b)   for matters specified in sub-section (2) of section 6;

(c)   any other matter which is required to be provided by rules by the Provincial Government.

90.   Amendment of Act 45 of 1860

The Pakistan Penal Code 1860 shall be amended in the manner specified in the First Schedule to this Ordinance,

91.   Amendment of Qanun-e-Shahadat Order 1984

The Qanun-e-Shahadat Order 1984 shall be amended in the manner specified in the Second Schedule to this Ordinance.

92.   Amendment of Act 18 of 1891

The Bankers' Books Evidence Act 1891 shall be amended in the manner specified in the Third Schedule to this Ordinance.

93.   Amendment of Act XXXIII of 1956

The State Bank of Pakistan Act 1956 shall be amended in the manner specified in the Fourth Schedule to this Ordinance.

THE FIRST SCHEDULE

(See section 90)

AMENDMENTS TO THE PAKISTAN PENAL CODE

(45 OF I860)

Electronic record.

1.   After section 29, the following section shall be inserted, namely:—

"29A. The words "electronic record " shall have the meaning assigned to it in clause (s) of sub-section (7) of section 2 of the Information Technology Ordinance, 2000.".

2.   In section 167, for the words "such public servant, charged with the preparation or translation of any document, frames or translates that document", the words "such public servant, charged with the preparation or translation of any document or electronic record, frames, prepares or translates that document or electronic record" shall be substituted,

3.   In section 172, for the words "produce a document in a Court of Justice", the words "produce a document or an electronic record a Court of Justice" shall be substituted.

4.   In section 173, for the words "to produce a document in a Court of Justice", the words "to produce a document or electronic record in a Court of Justice" shall be substituted.

5.   In section 175, for the word "document" at both the places where it occurs, the words "document or electronic record" shall, be substituted.

6.   In section 192, for the words "makes any false entry in any book or record, or makes any document containing a false statement", the words "makes any false entry in any book or record, or electronic record or makes any document or electronic record containing a false statement" shall be substituted.

7.   In section 204, for the word "document" at both the places where it occurs, the words "document or electronic record" shall be substituted.

8.	In section 463, for the words "Whoever makes any false documents or part of a document with intent to cause damage or injury", the words "Whoever makes any false, documents or false electronic record or part of a document or electronic record, with intent to cause damage or injury" shall be substituted.

9.	In section 464,—

(a)	for the portion beginning with the words "A person is said to make a false document" and ending with the words "by reason of deception practised upon him, he .does not know the contents of the document or the nature of me alteration", file following shall be substituted, namely:—-

"A person is said to make a false document or false electronic record—
First—Who dishonestly or fraudulently—

(a) makes, signs, seals or executes a document or part of a document;

(b) makes or transmits any electronic record or part of any electronic record;

 (c) affixes any digital signature on any electronic record;

(d) makes any mark denoting the execution of a document or the authenticity of the digital signature, with the intention of causing it to be believed that such document or a part of document, electronic record or digital signature was made, signed, sealed executed, transmitted or affixed by or by the authority of a person by whom or by whose authority he knows that it was not made, signed, sealed, executed or affixed; or

Secondly—Who, Without lawful authority, dishonestly or fraudulently, by cancellation or otherwise, alters a document or an electronic record in any material part thereof, after it has been made, executed or affixed with digital signature either by himself or by any other person, whether such person be living or dead at tile time of such alteration; or

Thirdly—Who dishonestly or fraudulently causes any person to sign, seal, execute or alter a document or an electronic record or to affix his digital signature on any electronic record knowing that such person by reason of unsoundness of mind or intoxication cannot, or that by reason

of deception practised upon him, he does not know the contents of the document or   electronic record or the nature of the alteration.";

(b)   after Explanation 2, the following Explanation shall be inserted at the end, namely;—

Explanation 3-For the purposes of this section, the expression "affixing digital signature" shall have the meaning assigned to it in. clause (d) of sub-section (J) of section 2 of the Information Technology Ordinance, 2000.'

10.   In section 466,—

(a)   for the words "Whoever forges a document", the words "Whoever forges a document or an electronic record" shall be substituted;

(b)   the following Explanation shall be inserted at the end, namely:— Explanation.—For the purposes of this section, "register" includes any list, data or record of any entries maintained in the electronic form as defined in clause (r) of sub-section (1) of section 2 of the Information Technology Ordinance,2000.

11.   In section 468, for the words "document forged", the words "document or electronic record forged" shall be substituted.

12.   In section 469, for the words "intending that the document forged", the words "intending that the document or electronic record forged" shall be substituted.

13.   In section 470, for the word "document" in both the places where it occurs, the words "document or electronic record" shall be substituted.

14.   In section 471, for the word "document" wherever it occurs, the words "document or electronic record" shall be substituted.

15.   In section 474, for the portion beginning with the words "Whoever has in his possession any document" and ending with the words "if the document is one of the description mentioned in section 466 of this Code", the following shall be substituted, namely:—

"Whoever has in his possession any document or electronic record, knowing the same to be forged and intending that the same shall fraudulently or dishonestly be used as a genuine, shall, if the document

or electronic record is one of the description mentioned in section 466 of this Code.".

16.   In section 476, for the words "any document", the words "any document or electronic record" shall be substituted.

17.   In section 477A, for the words "book, paper, writing" at both the places where they occur, the words "book, electronic record, paper, writing" shall be substituted.

THE SECOND SCHEDULE

(See section 91)

AMENDMENTS TO THE QANUN-E-SHAHADAT ORDER 1984

(1O OF 1984)

When oral admission as to contents of electronic records are relevant

1.   In Art.2,

(a)   in the interpretation of "Evidence", for the words "all documents produced for the inspection of the Court", the words "all documents including electronic records produced for the inspection of the Court" shall be substituted;

(b)   after the definition of "Pakistan", the following shall be inserted, namely:—

        "the expressions "Certifying Authority", "digital signature", "digital Signature Certificate", "electronic form", "electronic records", "information", "secure electronic record", "secure digital signature" and "Subscriber" shall have the meanings respectively assigned to them in the Information Technology Ordinance 2000;

2.   In Art.30, for the words "oral or documentary,", the words "oral or documentary or contained in electronic format shall be substituted.

3.   After Art.35, the following section shall be inserted, namely:—

        "35A. Oral admissions as to the contents of electronic records are not relevant, unless the genuineness of the electronic record produced is in question."

4.   In Art.48, for the words "Entries in the books of account", the words "Entries in the books of account, including those maintained in an electronic form" shall be substituted.

Admissibility of electronic records.

5.   In Art.49, for the word "record", in both the places where it occur, the words "record or an electronic record" shall be substituted.

What evidence to be given when statement forms part of a conversation, document, electronic record, book or series of letters or papers.

6.   For Art.53, the following section shall be substituted, namely:—

"53. When any statement of which evidence is given forms part of a longer statement, or of a conversation or part of an isolated document, or is contained in a document which forms part of a book, or is contained in part of electronic record or of a connected series of letters or papers, evidence shall be given of so much and no more of the statement, conversation, document, electronic record, book or series of letters or papers as the Court considers necessary in that particular case to the full understanding of the nature and effect of the statement, and of the circumstances under which it was made.".

Opinion as to digital signature when relevant.

7.   After Art.61, the following section shall be inserted; namely:—

"61A. When the Court has to form an opinion as to the digital signature of any person, the opinion of the Certifying Authority which has issued the Digital Signature Certificate is a relevant fact.".

8.   In Art.70, for the words "contents of documents" the words "contents of documents or electronic records" shall be substituted.

Special provisions as to evidence relating to electronic record.

9.   After Art.76, the following sections shall be inserted, namely:—-

"76A. The contents of electronic records may be proved in. accordance with the provisions of section 65B.

76B. (1)   Notwithstanding anything contained in this Ordinance, any information contained in an electronic record which is printed on a paper, stored, recorded or copied in optical or magnetic media produced by a computer (hereinafter referred to as the computer output) shall be deemed to be also a document, if the conditions

mentioned in this section are satisfied in relation to the information and computer in question and shall be admissible in any proceedings, without further proof or production of the original as evidence of any contents of the original or of any fact stated therein of which direct evidence would be admissible.

(2)   The conditions referred to in sub-section (1) in respect of a computer output shall be the following, namely:—

(a) the computer output containing the information was produced the computer during the period over which the computer was used regularly to store or process information for the purposes of any activities regularly carried on over that period by the person having lawful control over the use of the computer;

(b) during the said period, information of the kind contained in the electronic reform or of the kind from which the information so contained is derived was regularly fed into the computer in the ordinary course of the said activities;

(c) throughout the material part of the said period, the computer was operating properly or, if not, then in any respect of any period in which it was not .operating properly of was out of operation during that part of the period, was not such as to affect the electronic reform or the accuracy of its contents; and

(d) the information contained in the electronic record reproduces or is derived from such information fed into the computer in the ordinary course of the said activities.

(3)   Where over any period, the function of storing or processing information for the purposes of any activities regularly carried on over that period as mentioned in clause (a) of sub-section (2) was regularly performed by computers, whether—

(a)   by a combination of computers operating over that period; or

(b)   by different computers operating in succession over that period; or

(c)   by different combinations of computers operating in succession over that period; or

(d)   in any other manner involving the successive operation over that period, in whatever order, of one or more computers and one or more combinations of computers, all the computers used for that purpose during that period shall be treated for the purposes of this section as constituting a single computer; and references in this section to a computer shall be construed accordingly.

(4)   In any proceedings where it is desired to give a statement in evidence by virtue of this section, a certificate doing any of the following things, that is to say,—

(a)   identifying the electronic record containing the statement and describing the manner in which it was produced;

(b)   giving such particulars of any device involved in the production of that electronic record as may be appropriate for the purpose of showing that the electronic record was produced by a computer;

(c)   dealing with any of the matters to which the conditions mentioned in sub-section (2) relate, and purporting to be signed by a person occupying a responsible official position in relation to the operation of the relevant device or the management of the relevant activities (whichever is appropriate) shall be evidence of any matter stated in the certificate; and for the purposes of this sub-section it shall be sufficient for a matter to be stated to the best of the knowledge and belief of the person stating it.

(5)   For the purposes of this section,—

(a)   information shall be taken to be supplied to a computer if it is supplied thereto in any appropriate form and whether it is so supplied directly or (with or without human intervention) by means of any appropriate equipment;

(b)   whether in the course of activities carried on by any official, information is supplied with a view to its being stored or processed for the purposes of those activities by a computer operated otherwise than in the course of those activities, that information, if duly supplied to that computer, shall be taken to be supplied to it in the course of those activities;

(c)   a computer output shall be taken to have been produced by a computer whether it was produced by it directly or (with or without human intervention) by means of any appropriate equipment.

Explanation.—For the purposes of this section any reference to information being derived from other information shall be a reference to its being derived therefrom by calculation, comparison or any other process.".

Proof as to digital signature

10.   After Art.78, the following section shall be inserted, namely:—

"78A. Except in the case of a secure digital signature, if the digital signature of any subscriber is alleged o have been affixed to an electronic record the fact that such digital signature is the digital signature of the subscriber must be proved.".

Proof as to verification of digital signatures

11.   After Art.84, the following section shall be inserted, namely:—

"84A. In order to ascertain whether a digital signature is that of the person by whom it purports to have been affixed, the Court may direct—

(a) that person or the Controller or the Certifying Authority to produce the Digital Signature Certificate;

(b) any other person to apply the public key listed in the Digital Signature Certificate and verify the digital signature purported to have been affixed by that person.".

Explanation.— For the purposes of this section, "Controller" means the Controller appointed under sub-section (1) of section 17 of the Information Technology Ordinance, 2000.".

Presumption as to Gazettes in electronic form

12.   After Art.92, the following section shall be inserted, namely:—

"92A. The Court shall presume the genuineness of every electronic record purporting to be the Official Gazette, or purporting to be

electronic record directed by any law to be kept by any person, if such electronic record is kept substantially in the form required by law and is produced from proper custody.".

Presumption as to Gazettes in electronic agreements, electronic records and digital signatures

13.   After Art.95, the following sections shall be inserted, namely:—

"95A. The Court shall presume that every electronic record purporting to be an agreement containing the digital signatures of the parties was so concluded by affixing the digital signature of the parties.".

"95B. (1) In any proceedings involving a secure electronic record, the Court shall presume unless contrary is proved, that the secure electronic record has not been altered since the specific point of time to which the secure status relates.

(2) In any proceedings, involving secure digital signature, the Court shall presume unless the contrary is proved that—

(a) the secure digital signature is affixed by subscriber with the intention of signing or approving the electronic record;

(b) except in the case of a secure electronic record or a secure digital signature, nothing in this section shall create any presumption relating to authenticity and integrity of the electronic record or any digital signature.".

"95C. The Court shall presume, unless contrary is proved, that the information listed in a Digital Signature Certificate is correct, except for information specified as subscriber information which has not been verified, if the certificate was accepted by the subscriber.".

Presumption as to electronic messages

14.   After Art.98, the following section shall be inserted, namely:—

"98A. The Court may presume that an electronic message forwarded by the originator through an electronic mail server to the addressee to whom the message purports to be addressed corresponds with the message as fed into his computer for transmission; but the Court shall

not make any presumption as to the person by whom such message was sent.".

Explanation.— For the purposes of this section, the expressions "addressee" and "originator" shall have the same meanings respectively assigned to them in clauses (b) and (z) of sub-section (1) of section 2 of the Information Technology Ordinance, 2000.

Presumption as to electronic records five year old

15.   After Art.100, the following section shall be inserted, namely:—

"100A. Where any electronic record, purporting or proved to be five years old, is produced from any custody which the Court in the particular case considers proper, the Court may presume that the digital signature which purports to be the digital signature of any particular person was so affixed by him or any person authorised by him in this behalf.

Explanation,— Electronic records are said to be in proper custody if they are in the place in which, and under the care of the person with whom, they naturally be; but no custody is improper if it is proved to have had a legitimate origin, or the circumstances of the particular case are such as to render such an origin probable.

This Explanation applies also to Art.92A.".

Production of documents or electronic records which another person having possession, could refuse to produce

16.   For Art.14, the following section shall be substituted, namely:—

"14. No one shall be compelled to produce documents in his possession or electronic records under his control, which any other person would be entitled to refuse to produce if they were in his possession or control, unless such last- mentioned such person consents to their production.".

THE THIRD SCHEDULE

(See section 92)

AMENDMENTS TO THE
BANKERS' BOOKS EVIDENCE ACT 1891

(18 OF 1891)

1.   In section 2—

(a)   for clause (J), the following clause shall be substituted, namely:—

"books" include ledgers, day-books, cash-books, account-books and all other books used in the ordinary business of a bank whether kept in the written form or as printouts of data stored in a floppy, disc, tape or any other form of electro-magnetic storage device;"

(b)   for clause (8), the following clause shall be substituted, namely:—

"certified copy" means when the books of a bank,—

(a) are maintained in written form, a copy of any entry in such books together with a certificate written at the foot of such copy that it is a true copy of such entry, that such entry is contained in one of the ordinary books of the bank and was made in the usual and ordinary course of business and that such book is still in the custody of the bank, and where the copy was obtained by a mechanical or other process which in itself ensured the accuracy of the copy, a further certificate to that effect, but where the book from which such copy was prepared has been destroyed in the usual course of the bank's business after the dale on which the copy had been so prepared, a further certificate to that effect, each such certificate being dated and subscribed by the principal accountant or manager of the bank with his name and official title: and

(b)   consist of printouts of data stored in an electro-magnetic data storage device, a printout of such entry or a copy of such printout together with such statements certified in accordance with the provisions of section 2A."

Conditions in the printout

2.   After section 2, the following section shall be inserted, namely:—

"2A. A printout of entry or a copy of printout referred to in sub-section (8) of Conditions in section 2 shall be accompanied by the following, namely:—

(a)   a certificate to the effect that it is a printout of such entry or a copy of such printout by the principal accountant or branch manager; and

(b)   a certificate by a person in-charge of computer system containing a brief description of the computer system and the particulars of—

    (A) the safeguards adopted by the system to ensure that data is entered or any other operation performed only by authorised persons;

    (B) the safeguards adopted to prevent and detect unauthorised change of data;

    (C) the safeguards available to retrieve data that is lost due to systemic failure or any other reasons;

    (D) the manner in which data is transferred from the system to removable media like floppies, discs, tapes or other electro-magnetic data storage devices:

    (E) the mode of verification in order ensure that data has been accurately transferred to such removable media;

    (F) the mode of identification of such data storage devices:

    (G) the arrangements for the storage and custody of such storage devices;

    (H) the safeguards to prevent and detect any tampering with the system; and

    (I) any other factor which will vouch for the integrity and accuracy of the system.

(c)   a further certificate from the person in-charge of the computer system to the effect that to the best of his knowledge and belief that the computer system operated properly at the material time, he was provided with all the relevant data and the printout in question represents correctly, or is appropriately derived from, the relevant data.".

THE FOURTH SCHEDULE

(See section 93)

AMENDMENT TO THE
STATE BANK OF PAKISTAN ACT 1956

In the State Bank of Pakistan Act 1956, in section 54, in sub-section (2), after clause (p), the following clause shall be inserted, namely:—

> "(pp) the regulation of fund transfer through electronic means between the banks or between the banks and other financial institutions including the laying down of the conditions subject to which banks and other financial institutions shall participate in such fund transfers, the manner of such fund transfers and the rights and obligations of the participants in such fund transfers;".

22 IT Manpower Development: Policy And Action Plan

Preamble

One of the goals for achieving the stated vision of the National IT Policy is to *"develop an extensive pool of trained IT manpower to meet local and export requirements"*. IT is a knowledge-based industry and its raw material is a base of talented and highly skilled manpower. Government intervention in IT manpower development is required to ensure the *quality, affordability*, and *employability* of the manpower being produced. For instance only about 10 percent of BCS graduates are said to be of the quality required by software export firms. The overall poor quality is due to the severe shortage of qualified faculty with expertise in relevant technologies and disciplines, as well as weak monitoring and accreditation systems. The high cost of private IT education also prevents many able students to enter the IT profession.

This document describes targets for 2003 (based on an analysis of projected demand and supply in different areas of IT education), policy measures and an action plan for achieving these targets. Required resources and administrative arrangements to ensure the successful implementation of the action plan are also recommended.

Targets

In order to set targets for IT manpower development one needs to analyze the demand for IT professionals by different market segments. Three broad segments where software[3] professionals are employed include:

Software houses (catering to local & export markets)

Corporate and government organizations

Educational Institutions

It is estimated[4] that roughly 3000 professionals are employed in each of the above three segments. Of the 3000 professionals employed in software houses,

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[3] A separate analysis is needed to estimate the demand for hardware (including networking) professionals.
[4] This estimate is based on extrapolating from PITB's database of IT professionals (which includes data from 150 educational institutions in Punjab).

1000 are estimated to be working on export projects[5] and 2000 on local projects[6].

In order to reach the stated software exports target of $400 M by 2003[7], a rough schedule is developed below. Note that typically the local market is equivalent in size to the export market. Indeed it is the local market, which provides software firms the experience for competing in export markets. It is expected hat the IT industry (domestic and export) combined will be in the excess of US$ 1 Bln. Here IT covers not only software but other services under its definition.

Table 1111: Local and software Export Markets (1999-2003)

	1999	2000	2001	2002	2003
Total Exports ($ m)	20	50	100	250	400
Medium Tech[8]	20	30	50	100	150
Low Tech[9]	-	20	50	100	200
Local Market ($ m)					
Medium Tech[10]	20	30	50	50	50

Table 2222: Manpower Requirements[11] (1999-2003)

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[5] Average hourly billing of $20 an hour (and 1000 productive hours per year) results in $20 million of software exports. (Note that while actual billing may be $40 an hour, half of the value added and half of the expenses accrue in the international markets).

[6] With local billing at $10 an hour, one can estimate the local market (for software development) to be worth $20 million.

[7] As stated by the Minister of Science & Technology in the plenary session of the IT Commission on April 1, 2000.

[8] Medium tech assumes an average billing of $20 an hour, thus $20,000 per person per year. Assume also that this would rise to $50 an hour by 2003 (due to inflation and higher value addition). Note these numbers refer to value added in Pakistan. Actual billing (after including costs of operating in foreign markets) would double the hourly billing.

[9] Low tech assumes an average billing of $10 an hour, increasing to $20 an hour in 2003.

[10] Assume average billing in local market of $10 an hour, rising to $20 an hour in 2003.

[11] Manpower requirements are calculated based on average billing and project earnings (in local and export markets. Thus in 2000 medium tech exports of $30 million with average billing of $20/professional/hour

	1999	2000	2001	2002	2003
BCS (export firms)	1,000	1,500	2,000	5,000	10,000
BCS (local firms)	2,000	3,000	4,000	10,000	20,000
Tech Managers[12]	300	450	600	1,500	3,000
Diploma (Low Tech exports)	-	2,000	4,000	15,000	30,000

Assuming the above growth rates and an attrition rate of a third[13], implies that about 2500 new IT professionals (with BCS degrees) will be required by software houses in 2000, and about 20,000 will be required in 2003. Similarly 3000 professionals with project management experience are required (who could be MBAs with specialized training on management of IT projects). Producing 20,000 BCS graduates would require about 3000 qualified teachers[14]. Another 1000 teachers would be required for short courses.

Targets for 2003 thus includes annual production of about:

2,000 quality MCS graduates

20,000 quality BCS graduates

30,000 diploma, certificate holders (through short courses)

Supply of Manpower

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and 1000 hours/year implies that 1500 professionals (with minimum of BCS or equivalent) would be required.

[12] It is assumed that one technology manager is required to supervise and manage 10 developers/ IT professionals.

[13] Software export houses typically lose one-third of all their professionals (with over 2 years experience) each year. Most of these go abroad or start their own local IT firms. Note that a typical software development team consists of one team leader (with about 3 years of experience) supervising 3 developers (programmers), and one project manager (with about 5 years of experience) managing 3 teams.

[14] Annual production of 20,000 BCS graduates implies an enrollment of 60,000. A student: teacher ratio of 20:1 implies that 3000 teachers would be required with a minimum of Masters in Computer Science.

A rough estimate[15] indicates that 6000 BCS graduates and 3500 MCS graduates were produced in 1999. About 30,000 students took short courses leading to a diploma or certificate. Of those enrolled in such short courses about half took courses on office applications and thus are being trained for office work rather that as IT professionals.

Table 3333: Manpower Supply[16] (1998-2001)

	1998	1999	2000	2001
BCS graduates	1,500	6,000	9,000	15,000
MCS graduates	1,300	3,500	6,000	9,000
Diploma, Short Courses	15,000	30,000	40,000	50,000
MBA[17]	2,500	2,500	6,000	7,000

The supply of IT manpower shows high growth rates (over 50% a year) as the private sector[18] has responded rapidly to the high social demand for (and the profitability of) IT education.

An analysis of tables 2 and 3 indicates that the projected supply matches quite closely the projected demand for IT manpower. However the problem is not with the numbers but with the quality of the manpower being produced[19]. According to software houses, only 10 percent of BCS graduates are of the quality required for export projects. The proliferation of colleges offering BCS[20] and MCS[21] degrees has resulted in large variations in curricula. Weak

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[15] A PITB survey of 142 educational institutions in Punjab indicated that 92 offered BCS degrees and 56 offered MCS degrees. In Punjab in 1999 about 3000 students graduated with BCS degrees, 1800 with MCS degrees, and 8500 with diplomas and certificates. It is assumed that the national numbers are roughly double those for Punjab.

[16] The PITB survey asked educational institutions to estimate the number of graduates for the year 2000 and 2001. National numbers are assumed twice of Punjab.

[17] There is currently an increasing surplus and under-employment of MBAs. MBAs with an aptitude for technology could be provided specialized training in MIS and IT project management.

[18] Historically public universities (such as Punjab University, Quaid-e-Azam University, and Karachi University) have focused on MSc (Comp Sci) programmes rather than BCS programmes, resulting in uncontrolled growth of private institutions that were offering weak and often rather expensive BCS programmes.

[19] One indicator of how the market measures quality is by the salaries offered to graduates. The variation in average starting salaries for BCS graduates from different colleges ranges from Rs. 4000 to 15000 per month.

[20] Of the 3000 BCS graduates in Punjab in 1999, 40% studied at colleges affiliated with Punjab University, 23% with Allama Iqbal Open University (many colleges offer this as a 18 or 24 month programme), and 30% with colleges which had applied for affiliation.

[21] Of the 1800 MCS graduates in Punjab in 1999, 85% studied at colleges which had no charter to grant an MCS degree! At the same time, FAST which has one of the best BCS programmes in the country, has been trying unsuccessfully since the last several years, to get permission to offer an MCS programme.

curricula, the critical shortage of qualified faculty, the high cost of IT education, and poor monitoring and accreditation mechanisms, are the key reasons for the poor quality of IT manpower being produced.

Long Term Master Plan

A comprehensive master plan for manpower development requires initiatives to be launched to upgrade IT education at each of the following levels:

Schools

Intermediate (ICS)

Bachelors (BCS, B. Comp. Engg.)

Masters (MCS/MSC; MIS & IT Project Manangement)

Short Courses (Diplomas, Certifications etc.)

Success of such an initiative (say for upgrading BCS education to international standards) would require the rapid implementation of a comprehensive plan addressing each of the following six areas[22]:

Curriculum development (including new technologies and teaching aids)

Infrastructure development (distance learning, telecommunications, etc.)

Faculty training and development (including teacher certification)

Student scholarship and financial aid

Quality assurance through monitoring & accreditation system

Market linkages through internships, projects, placement service

Immediate Action Plans

Action plans for immediate implementation are recommended to strengthen selected areas of IT education. Rather than over-regulate the market it is

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[22] The PITB-Oracle Initiative demonstrates the dramatic impact which can be made when a focused effort is made to upgrade curricula and faculty. In September 1999 an 8-month programme was launched (in 6 private and 4 public institutions) to prepare students for becoming Oracle Certified Professionals (OCPs). Teachers were trained, scholarships provided (to attract the best students) and a standard curriculum strictly enforced. By March 2000, Pakistan had become the third highest producer of OCPs (after U.S.A. and Canada) and Oracle Corporation was describing the PITB initiative as a "global best practice"! There is no reason why similar results cannot be achieved by focused efforts to upgrade BCS and MCS education.

suggested that institutions be offered the opportunity to participate in programmes to upgrade quality to desired standards. Such participating institutions would be offered the opportunity to send their faculty to refresher courses, to revise their curricula, to participate in national scholarship programmes, and receive other support such as subsidized Internet access. In return these institutions would allow the quality of their programmes to be monitored through a set of objective criteria and performance measures[23].

Bachelors Education

It is suggested that the following initiatives be launched for strengthening BCS and Computer Engineering[24] education in selected participating educational institutions:

Standardized Curriculum: A standard curriculum could be recommended to all institutions having the charter to offer Bachelors degrees. Note that revision of university curricula is typically handled by the university syndicate and is guided by the University Grants Commission (UGC).

Faculty Refresher Courses: Short refresher courses (5-10 days) in each of the core areas of the BCS and Computer Engineering curriculum. These courses could be organized during the summer. 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. The set of experts could also deliver distance learning, and act as a specialized resource base for guiding and monitoring BCS education.

Student Scholarships: The high cost of BCS education (Rs. 50,000 plus per year in private institutions) prevents many able students to enter the IT profession. A national scholarship fund for BCS students should be established. Scholarships would be given based on a nation-wide test (which could also gradually become a standard component of entry testing). Students would be able to avail of the scholarships at selected educational institutions (offering quality BCS education as determined by a set of objective criteria). Note that the scholarship scheme will encourage educational institutions to rapidly upgrade their faculty, curricula, and facilities in order to participate in the national scholarship scheme.

Infrastructure Development: Infrastructure for offering IT education needs to be strengthened. Subsidized Internet access could be made available to selected[25]

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[23] This is in some ways similar to the concept of *franchising*, wherein an organization agrees to maintain certain service quality levels and in return gains the benefits of being recognized as an international brand.
[24] Several Engineering Universities (particularly in Electrical Engineering departments) offer programmes with courses in areas related to computer hardware and telecommunications. Such programmes need to be strengthened and supported.

educational institutions. Laboratory facilities could be upgraded at public sector universities.

Faculty Compensation: Faculty compensation systems have to be devised to attract qualified IT faculty, particularly in public sector educational institutions.

Masters and PhD Education

The following initiatives are recommended for strengthening PhD, MSc (Comp. Sci, Comp Engg.) and MBA (MIS):

Faculty Chairs: A set of faculty chairs could be established at selected institutions. These chairs would encourage faculty to focus in their area of specialization. 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 and offer elective courses (in the area), and develop teaching material and conduct a (5-10 day) faculty refresher course in the area.

Scholarships: A scholarship scheme to encourage the best students to enroll in graduate education.

Curricula: Curricula needs to be strengthened in the areas of Computer Science, Computer Engineering, and MIS (particularly for developing IT project managers).

Diploma, Short Courses and FSc

Capacity development: Develop capacity of selected educational institutions to introduce new technologies and provide training in skills needed by the market. Short courses will need to be developed to cater for data entry and other low tech jobs.

Monitoring mechanisms: Regulatory or other accreditation methods need to be devised to ensure quality of training courses offered.

Strengthen FSc Education: There is a serious need to upgrade the curriculum of the Computer Science paper at the FSc level (ICS[26]).

Student Placement and Manpower Databases

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[25] Institutions being provided free Internet would be those selected to participate in the national scholarship scheme.

[26] The syllabus was last revised in 1986 and continues to teach FORTRAN as the main programming language.

Develop IT Manpower Database based on surveys of IT professionals (including salary survey)

Educational Institutions

Software Houses

Corporate and Government users of IT

Promote Pakistan as a serious player in IT education

Arrange for Pakistan pavilion in educational exhibitions

Market Pakistani IT graduates in selected markets (Australia, Malaysia, Germany, etc.)

Web site to assist IT graduates get local and international jobs

Budget

Budgets need to be allocated for launching initiatives in each of the following areas:

Table 4444: Budget allocation (by initiative)

Action	School	FSc/ ICs	Voca- tional	BCs, BSc(Ee)	MCs / PHd	Short Course	Cont Edu. (IT Profs)
Curriculum							
Accreditation							
Faculty: Chairs Refresher Courses -Compensation							
Entry, Exit Tests							
Scholarships							
Placement, Mkt Linkages							
Research Studies, Database Creation							

IT Manpower Development Policy

The section on IT Manpower Development (Section 4.3) contained in the *Draft National Information Technology Policy of Pakistan*, (proposed by the NDO and CSP and revised by Chairman NTC, dated 24-03-2000) is presented below.

IT Manpower Development

A major human resources development issue in Pakistan is the training, nurturing and retention of technically skilled manpower. This problem is even more severe in the Information Technology field as technology changes here are very rapid and there is a massive loss of trained manpower due to migration.

IT Manpower Development is imperative for large-scale successful adoption and utilization of Information Technology. As Pakistan attempts to build itself into a major IT player in the world, it is crucial to have skilled IT Manpower in order to launch and sustain such an effort. The manpower requirement is both for local and export needs, in all facets of IT. No significant achievement would be possible without a large and skilled pool of IT manpower.

A comprehensive plan for education and human resource development in IT shall be drawn up to meet the present and future needs of manpower. A working group shall be established to advise on current and emerging education and training needs.

The main points would be : launching a massive IT awareness program aimed at all sections of the society including top politicians and bureaucrats/technocrats, review and expansion of the IT Education sector (Degree/Diploma Program) and proliferation of the IT Training facilities (hands on user level). To ensure the above HRD fund shall be created and incentives (Duty free imports of teaching aids etc) shall be given.

Banks/ DFI's/ SMEADA will be asked to set aside funds for the IT education sector.

This section of the IT Policy will cover:

Computer Literacy programs would be aimed at creating massive awareness regarding the use of IT as an everyday tool. These awareness programs will be aimed at all sections of the society and will include top politicians, technocrats and bureaucrats.

IT Education will cover diploma/ degree and other relevant programs in various facets of IT.

IT Training programs will be needed to train intended end-users of IT. These programs will consist of courses and hands on training covering specific and focussed application of IT.

Information Technology Awareness

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

Extensive usage of a catchy slogan to aid in the awareness drive. A national competition shall be held to select the slogan.

Prime Minister, Ministers and all key figures who can influence public opinion shall consciously propagate the use of IT in all public and private forums.

Declaration of the next fiscal year as "IT Year".

Special events shall be chalked out during this year such as National IT Conference cum Computer Exhibition in major cities, Mobile Computer Exhibition, International Conference and Exhibitions, IT competitions at various levels, Special programs on electronic media, etc.

High profile 'forced' awareness seminars shall be conducted for politicians and top Government policy / decision makers all over the country in order to galvanize them to promote IT at all levels..

The matriculation curriculum for high schools shall have Computer Literacy as a compulsory module. The relevant Working Group shall work out the induction of this module on a crash basis.

IT Education

The Government and the Private Sector shall jointly make efforts to meet IT Education needs. The relevant working group shall work out detailed plans. However, some of the main points are listed below:

A HRD fund (HRDF)shall be established. For this various avenues would be explored including funding from UN and other international agencies. This fund would be utilized to expand IT educational facilities, improve the quality of IT education, upgrade laboratories and equipment, get visiting faculty of

international repute, conduct distance learning programs, promote IT education, etc.

Government shall encourage setting up of IT education university/institutes. Collaboration between Government and private sector in such large scale projects shall also be encouraged. Large foundations such as Army Welfare Trust, Shaheen and Bahria Foundation, Multinational companies in Pakistan, foreign universities/ institutes and other social and welfare organization shall also be encouraged to come forward to help the Government in this vital area of setting up education institutes of international standards. A number of centers of excellence by the name of Pakistan Institute of Information Technology (PIIT) shall be established. These would be affiliated with universities/institutes of international repute.

The syllabi of public sector universities providing IT education shall be reviewed and updated periodically to bring these inline with the best in the world. Private sector will be closely associated with this effort.

The facilities at the IT departments in the universities shall be continuously modernized and upgraded to keep them up to date. They shall also be linked to domestic and international academic networks and the Internet. Pairing of these local universities with renowned Local/Foreign Universities/ Institutes shall be encouraged.

A mechanism for sharing highly qualified faculty in IT between the government, universities and private sector institutions shall be developed for optimum utilization of this expertise. Visiting faculty and distance learning shall be introduced in universities specially those located in remote areas. Internationally renowned experts, both foreign and expatriate Pakistanis shall be provided incentives to be involved in this effort. Various options for funding shall be explored e.g. allocations set inside by international bodies, like UN, World Bank, ADB etc., shall be utilized.

Proficiency in use of IT shall be made a compulsory component of all degree courses within the next 3 years.

R&D in IT shall be encouraged and interaction between universities and private sector shall be promoted.

IT Training

To ensure that the vision of widespread and effective use of IT is realized, the training aspect shall be assigned the highest priority. Investment in this area would yield maximum results.

The relevant working group shall prepare detailed plans for IT training. However, the main points are listed here.

The HRD fund would also be used for IT training activities.

Government shall encourage setting up of IT training institutes.

The Computer Society of Pakistan shall be encouraged to, in addition to its normal activities, become an Institution of IT Professionals that shall provide accreditation to IT professionals. Funding, if necessary, may be provided to CSP for this purpose.

Quality of IT training shall be ensured by encouraging IT training institutes to be affiliated with local/international universities/institutes of repute.

IT training institutes shall be encourage to have syllabi and programs in line with the best in the world and that are synchronized with the objectives of this policy.

Teach the Teacher/Trainer programs shall be organized on top priority basis to meet the growing demand for qualified teachers in IT and for upgrading their skills regularly.

The Government shall emphasize training through a technical grant program or endowment that provides training and degree opportunities countrywide, allowing educators to renew skills.

The annual production of IT professionals shall be increased on crash, training program, basis.

The training institutions and universities shall be asked to arrange special computer courses during the vacation period to meet training needs in IT. This will ensure maximum utilization of the existing facilities.

Government shall extend the use of its existing facilities in educational institutions, when not in use, to the private sector, to conduct training programs.