Information and Communications Technology for Development

A Sourcebook for *Parliamentarians*

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Foreword

Information and Communications Technology (ICT) has proven its role in accelerating sustainable development and bridging the ever-growing divide in our present day society. There is, however, a critical need to channel the vast potential of ICT in the right direction for the betterment of society and effective human development.

I am personally delighted to see the efforts of the UNDP's Asia-Pacific Development Information Programme (UNDP–APDIP), the Global Knowledge Partnership (GKP), and the Swiss Agency for Development and Cooperation (SDC), in actively promoting and building awareness about the vast potential of ICT for human development in different sections of society.

The e-Awareness Seminar Series for Asian Parliamentarians (e-ASSAP) organized by UNDP-APDIP in Hanoi, Colombo and New Delhi, has been extremely well received by the members of parliament who participated and has been considered by many as a timely initiative and a critical area of interest for most parliamentarians across the Asia-Pacific region.

As the Chair of the New Delhi phase of e-ASSAP, I was pleased to have had the opportunity to deliberate with my distinguished colleagues on the journey ahead and the importance for parliamentarians to grasp the fundamentals of this new and challenging digital economy and networked society.

Asian economies are growing at a phenomenal rate. However, the rate of growth varies vastly among the different countries in Asia, thus creating a digital divide among nations. It is, therefore, imperative that Asian countries work together to harness the potential of ICT for development and ensure the divide is not a permanent chasm that marginalizes and excludes the less developed nations from the interconnected digital economy.

Some of our nations have acquired a high degree of competence in the applications of ICT and are leading in the field of software and hardware development. Thus, initiatives in sharing their experiences and best practices will facilitate other countries to learn from their knowledge and leapfrog in the race of human development. However, it must be noted that developing countries have specific issues and needs that have to be carefully examined. In view of this, the identification, selection and customization of the choice of technology have to be undertaken seriously and with a great degree of planning.

The use of ICT for providing cost-effective tele-education and tele-medicine to far-flung areas of our nations is a dream that all of us cherish. Empowering the poor, women, and the disabled through ICT to live an honourable and dignified life should be our dream.

To take our respective nations towards a knowledge society by using ICT necessitates that all the stakeholders in society take a pro-active role in this development. Parliamentarians, as the representatives of the people, have a greater responsibility and the political leadership through parliamentarians can and should play a pro-active role in this endeavour. The *Information and Communications Technology for Development — A Sourcebook for Parliamentarians* is a timely contribution to encourage parliamentarians to assume their new role in this ICT era.

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Preface

This Sourcebook acknowledges the varying needs of parliamentarians in different geographic, social, economic and political environments and seeks to provide a broad overview of ICTs and their use as powerful tools for accelerating social and economic development. It highlights the key and fundamental ICT for Development (ICT4D) issues by emphasizing the importance of ICT4D policies, the development of national ICT agendas, the application of ICTs in specific sectors, and the role of government and members of parliament in the process of implementing ICT4D in their respective countries. Examples from the region are provided to demonstrate how different stakeholders have successfully applied ICTs to bridge the digital divide with concrete socio-economic benefits.

To supplement the information that is available in this Sourcebook with timely and up-to-date information relevant to parliamentarians on ICT4D initiatives taking place in the Asia-Pacific region, a website—the Asian Parliamentarians Forum (www.eAPF.net)—has been created. It provides a 'Policy Watch' repository that comprises ICT policy documents from countries in Asia and a collection of case studies and best practices showcasing ICT4D initiatives from the region. Links have also been created to websites of parliamentary associations and assemblies currently available on the Internet.

The Sourcebook and the accompanying website are outputs of e-ASSAP, a UNDP-APDIP project, supported by the Global Knowledge Partnership (GKP) and funded by Swiss Agency for Development and Cooperation (SDC). These seminars aimed to sensitize parliamentarians who are responsible for debating development priorities and making decisions on the allocation of resources with government representatives and international agencies. The seminars also provided an opportunity for Asian parliamentarians to discuss and share their knowledge and experience in the various ICT4D initiatives. The seminar series was structured to provide and equip participants with key skills required to evaluate and monitor ICT initiatives within their respective countries, with an emphasis on the importance of analysing the objectives of ICT4D programmes, determining appropriate ICT components, empowering and encouraging stakeholder participation, and evaluating the eventual outcomes of ICT4D initiatives.

On behalf of UNDP-APDIP, SDC and GKP, we hope that you will find this publication useful and beneficial in understanding the process of conceptualization, design, implementation and evaluation of ICT4D initiatives.

Shahid Akhtar   Walter Fust   Rinalia Abdul Rahim
UNDP-APDIP   SDC   GKP

Introduction

1.1 Overview

ICTs are usually defined as technologies that facilitate communication and the processing and transmission of information by electronic means. This broad definition encompasses the full range of ICTs from radio and television to telephones (fixed and mobile), computers and the Internet.

The revolutionary potential of ICTs lies in their capacity to instantaneously connect vast networks of individuals and organizations across great geographic distances at very little cost. As such, ICTs have been key enablers of development, facilitating flows of information, capital, ideas, people and products. An explicit focus on using ICTs in pursuit of development goals allows countries to achieve a wide diffusion of benefits from ICTs and contributes to both broad-based economic growth and specific development goals.

Moreover, a holistic approach that sees ICTs as key development enablers recognizes that the potential of ICTs is linked to a complex mixture of international, national and local conditions. A number of interrelated factors should be addressed to maximize the benefits of ICTs for development. These include deploying ICT infrastructure, building human capacity, establishing a transparent and inclusive policy process, creating incentives for enterprise, and developing appropriate content.

For all these to be realized, there is a need to understand the critical relationships between various strategic interventions in the context of local conditions and to secure the participation and commitment of all key stakeholders—local communities, non-governmental organizations (NGOs), governments and the private sector.

Members of parliament and government decision-makers need to provide the necessary guidance for efforts to remove existing barriers and promote innovative solutions. Through government vision and leadership, the critical objectives of stakeholders can be aligned and the potential of new collaborative alliances unleashed to harness the power of ICTs for development.

However, there is no single way of using ICTs to achieve development objectives. Countries and communities are experimenting with different initiatives and approaches that take into account diverse conditions and resources with great effect. Similarly, a holistic approach does not imply that action must necessarily be taken in all areas at once. Rather, it offers a strategic framework for designing and prioritizing development initiatives with a view to maximizing their long-term impact.

1.2 Objectives

The objectives of this Sourcebook are to:
- sensitize parliamentarians to ICTs and the role that they play in development, and to highlight how they can be utilized effectively for poverty alleviation and sustainable human development in the Asia-Pacific region, thereby accelerating social and economic development;
- underscore the cross-cutting role of parliamentarians in the promotion and use of ICT products and services;
- illustrate the role of governments in ICT for development initiatives; and
- provide a reference to best practices and examples of applications of ICTs for development.

1.3 ICTs Defined

In order to assess the potential role of information and communication technologies for development, a proper understanding is required of what ICTs actually are. According to UNDP:

"ICTs are basically information-handling tools—a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' ICT of radio, television and telephone, and the 'new' ICT of computers, satellite and wireless technology and the Internet. With appropriate content and applications, these tools are now able to work together, and combine to form a 'networked world'—a massive infrastructure of interconnected telephone services, standardized computing hardware, the Internet, radio and television—which reaches into every corner of the globe." [1]

1.4 The Importance of ICTs

ICTs present a revolutionary approach to addressing developmental questions due to their unequalled capacity to provide access to information instantaneously from any location in the world at a relatively low cost.[2] This has brought down global geographic boundaries faster than ever thought possible. The resulting new interconnected digital world heralds the fluid and seamless flow of information, capital, ideas, people and products. Thus, McLuhan's notion of a *Global Village* seems more appropriate now than when it was first coined.[3]

The advances made in *convergence technologies*, whereby the mode of information available is no longer restricted to text but includes real-time audio and video data streaming, have many implications for and applications in all fields

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[1] Essentials, UNDP Evaluation Office (Sept. 2001), No. 5, p. 2; available at www.gipiproject.org/practices/essentials5-web.pdf; retrieved 27 October 2002.

[2] Drake, W. *The Rise and Decline of the International Telecommunications Regime*; available at http://www.ceip.org/files/projects/irwp/pdf/draketelecom.pdf; retrieved 10 December 2002.

[3] Dizard, W. 'Digital Diplomats', *iMP: The Magazine on Information Impacts*; available at http://www.cisp.org/imp/july_2001/07_01dizard.htm; retrieved 27 October 2002.

of human knowledge as well as in social, economic and political life.[4] In fact, many governments, the private sector and civil society members are beginning to recognize the immense potential offered by ICTs in overcoming structural and historical weaknesses. They argue that **ICTs offer the developing world the opportunity to 'leapfrog' several stages of development** by the use of 'frontier' technologies that are more practical, environmentally sound and less expensive than undergoing the traditional stages and cycles of progress to the information society.

1.5 The Digital Divide

Definition: The core of this concept lies in the acknowledgement of the existence of an environment that sustains 'unequal and unaffordable access to digital and network resources; enormous disparities in the ICT endowment/infrastructure, and the lack of suitable local digital content.'[5] The digital divide cuts across international borders and goes beyond the gap between developed and developing nations to include the unequal participation of women, youth and marginalized communities, as well as the lack of local culture and content. The concept has also been applied to reflect the disparity in access to information that is growing within nations, namely, between the rich and poor and between urban and rural communities. The dimensions and definitions are varied and dependent on the context, but are primarily centred on a sense of ownership, participation and benefits derived from the new interconnected world.

Importance: In recent years, as ICTs have become a more important part of the global information economy, more attention has been given to the gap in access to ICTs between developed and developing nations, and also within countries.

How it developed: There are many reasons to explain today's very evident digital divide. With the aggressive development of ICTs in the last decade, the rate of growth in the developed world has, in fact, been much higher than the expected growth rate in developing countries. This is partly explained by the fact that during this new realization period, developing countries had to start enhancing their infrastructures without giving much priority to the issue of applications. In the meantime, developed countries had ample time and incentive to pursue increased penetration and facilitate an environment for ICT use. This came in the form of banking structures, e-commerce and on-line payment facilities, additional value-added services, and the like. The disparity that developed came to be known as the digital divide. Within countries, the disparity arose from the faster pace of infrastructural development in urban centres and the comparatively slower growth in rural areas.

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[4] Cincotta, H. 'Post-Modern Diplomacy and the New Media', *iMP: The Magazine on Information Impacts*; available at   http://www.cisp.org/imp/july_2001/07_01cincotta.htm; retrieved 27 October 2002.

[5] Otani, S. 'Social, Cultural and Economic Issues in the Digital Divide—Literature Review and Case Study of Japan'; available at http://satjournal.tcom.ohiou.edu/issue5/social.html; retrieved 19 November 2003.

Table 1. The Economic and Digital Divides	Richest 20%	Poorest 20%
Share in world GDP	86%	1%
Share in exports	82%	1%
Telephone lines	74%	1.5%
Internet	93.3%	0.2%

1.6 ICTs and the UN Millennium Development Goals

Digital opportunities provided by ICTs are fundamental to the improvement of all aspects of developing economies and their entry into the global marketplace. While **ICTs are not a panacea** for all development problems, they offer enormous opportunities to narrow social and economic inequalities, and thus help achieve broader development goals, such as the Millennium Development Goals (MDGs) set by the United Nations (see Annexure 1)

In the development strategy of the United Nations Development Programme[6] there is a focus on mainstreaming ICTs to effectively contribute to the achievement of the MDGs, particularly those related to income, poverty reduction, education, health, environment and gender equity by:

- creating economic opportunities and contributing to poverty reduction;
- managing the processes of providing basic services (for example, health care and education) at lower cost and with greater coverage;
- facilitating access to information and the involvement of stakeholders through greater transparency and support for networking at every stage; and
- enhancing the capacity to measure, monitor and report progress on the goals and to strategize.

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[6] ICT for Development and the MDGs; available at http://ictd.undp.org/it4dev/gpm/docs_pdfs/srf_mgd_ict.doc

Concepts and Definitions

Knowledge Economy: Broadly, the term refers to a nation that makes effective use of knowledge for its economic and social development, including tapping global knowledge as well as adapting and creating knowledge for its specific needs.

Internet Economy: The Internet economy pertains to all economic activities using electronic networks as a medium for commerce, and those activities involved in building the networks linked to the Internet and the purchase of application services.

e-Commerce: This refers to a wide range of on-line business activities involving products and services. It also pertains to any form of business transaction in which the parties interact electronically rather than by physical exchange or direct physical contact.

B2B e-commerce: Business-to-Business e-commerce is defined as e-commerce between companies and therefore deals with relationships between and among businesses (for example, raw material marketplaces such as chemical exchanges, auto part procurements, etc.).

B2C e-commerce: This refers to Business-to-Consumer e-commerce, or commerce between businesses and consumers.

e-Tailing: This is shorthand for electronic retailing, the selling of retail goods over the Internet. It is the most common form of B2C transactions (an example is on-line sale and purchase of books and DVDs).

B2G e-commerce: Business-to-Government e-commerce is defined as commerce between companies and the public sector. It refers to the use of the Internet for public procurement, licensing procedures and other government-related operations.

C2C e-commerce: Consumer-to-Consumer e-commerce is commerce between private individuals or consumers. This type of e-commerce is characterized by the growth of electronic marketplaces and on-line auctions.

m-Commerce: Mobile commerce is the buying and selling of goods and services through wireless technology or handheld devices such as cellular telephones and personal digital assistants (PDAs).

e-Governance: This broad concept allows the possibility of increasing, enhancing and deepening citizen participation in the policy- and decision-making processes of government through a spectrum of electronic activities—electoral campaigns, voting, consultation and participation in the policy process, public opinion polling and communication exchange between elected officials and constituents, resulting in strengthening accountability and transparency of government actions.

e-Government: The term refers to e-services and e-applications used by the government in carrying out its day-to-day activities. Broadly defined, e-government is the use of ICTs to promote more efficient and effective government, and to

facilitate more accessible government services. e-Government might involve delivering services via the Internet, telephone, community centres (self-service or facilitated by others), wireless devices or other communications systems.

e-Government can be classified into four distinct areas:

- **G2C:** Government-to-Citizen (G2C) includes information dissemination to the public, basic citizen services such as license renewals, ordering of birth/death/marriage certificates and filing of income taxes, as well as citizen assistance for such basic services as education, health care, hospital information, libraries, and the like.
- **G2B:** Government-to-Business (G2B) transactions include various types of services exchanged between government and the business community, including business policies, memos, rules and regulations. Business services offered include obtaining current business information, downloading application forms, renewing licenses, registering businesses, obtaining permits and payment of taxes. G2B services focus in particular on procurement activities. Typically, e-procurement websites allow qualified and registered users to look for buyers or sellers of goods and services. Such services allow for transparency in the bidding process and give fair opportunities.
- **G2E:** Government-to-Employee (G2E) services encompass G2C services, as well as those specialized services that cover only government employees, such as the provision of human resource training and development that improve efficiency and increase employee productivity. These services may also include personnel and accounts-related services within government departments.
- **G2G:** There are two levels of Government-to-Government (G2G) services— the local or domestic level and the international level. G2G services are transactions between the central/national and local governments, and between department-level and attached agencies and bureaus. At the same time, G2G services are transactions between governments, which can be used as an instrument of international relations and diplomacy.

MDGs (Millenium Development Goals): These constitute an agenda for reducing poverty and improving lives that world leaders agreed on at the Millennium Summit in September 2000 (see Annexure 1).

Open Standards: This facilitates access to different networks and sources of information. It allows different service providers and programmes to inter-operate and exchange information, thereby establishing a level playing field for the diffusion of new products and services.

Open Source: Open source software are programs whose licenses give users the freedom to run the programs for any purpose, modify them if desired, and redistribute the original or modified versions without having to pay royalties to the previous developer.

Telecentres: Telecentres come in different forms. They can simply be a telephone shop that provides local, Subscriber Trunk Dialing (STD) and International Subscriber Dialing (ISD) call facilities. Some telecentres add Internet and email services, while other centres add facsimile and photocopying machines to these basic services. A variety of additional programmes, such as secretarial

services, business cards/stationery publishing, computer training, labour market support and newspaper production can also be offered.

Multipurpose Community Telecentre (MCT): A MCT can be considered a technology hub that allows a community to establish many programmes and services that provide social, economic and information technology support.

Telemedicine: Telemedicine is defined as the use of telecommunications to provide medical information and services.

Internet-specific Concepts

Information Superhighway: This refers to broadband networks capable of transferring very large amounts of information, including video, still images, audio and text, at high speed between remote users.

World Wide Web (WWW): Also known as the WWW, W3 or simply the 'web', the World Wide Web is a distributed information service on the Internet consisting of linked hypertext documents accessed using a web browser such as Microsoft's Internet Explorer or Netscape. On the web, any document can be linked to any other document.

Hyperlink: This is the pre-determined area (which can be a word or set of words, an image or part of an image) in a hypertext document such as a web page, which can be clicked on to jump to other documents, or other parts of the same document.

HyperText Transfer Protocol (HTTP): This is the standard for the process of requesting and transferring data on the World Wide Web. Although primarily used to transfer web pages, the protocol can transfer almost all data types, including images, video and other binary data.

Internet Protocol (IP): This is a set of communication standards that control activity on the Internet. An IP address is the number assigned to any computer connected to a network or the Internet, and is the principal means by which information sent through the Internet can find its way to that computer. It is a number of the form, A.B.C.D, where each letter represents a number from 0 to 255 (for example 193.63.56.222).

Uniform Resource Locator (URL): This is the unique reference locating a file on the World Wide Web and other Internet resources. The UNDP URL, for instance, is http://www.undp.org.

e-Primers for the Information Economy, Society and Polity

The e-primers on the Information Economy, Society and Polity series is a regional public information effort of UNDP-APDIP to provide policy makers and opinion leaders in developing countries of the Asia-Pacific region with a clear understanding of the various terminologies, definitions, trends and issues surrounding the information economy, as well as the specific implications of ICTs for their societies.

The e-primers also provide developing countries with a compendium of global best practices of ICT-facilitating conditions—physical and financial infrastructure, legal and regulatory frameworks, skills development, scientific research and development, and others—which are required to harness and direct their individual resources toward growth, development and poverty reduction.

The present series of e-primers includes the following titles:

- The Information Age
- Nets, Webs and the Information Infrastructure
- e-Commerce and e-Business
- Legal and Regulatory Issues for the Information Economy
- e-Government
- ICTs and Education
- Genes, Technology and Policy: An Introduction to Biotechnology
- Free/Open Source Software: A General Introduction
- Information and Communication Technologies for Poverty Alleviation

The full text of all e-primers can be accessed at http://www.eprimers.org.

ICTs for Development (ICT4D)

3.1 ICTs and National Strategies

The ICT policies and strategies of developing countries vary greatly in terms of their objectives, design and approach to implementation. The role of ICTs as an enabler of development has two facets within the production and service sectors:

1. The first encompasses the production of hardware, software and communication equipment—that is, the development of ICT-related industries.
2. The second involves exploiting the potential of ICTs to accelerate broad-based development by harnessing ICT-enabled services.

Figure 1 — The Role of ICTs in National Strategies: A Typology[7]
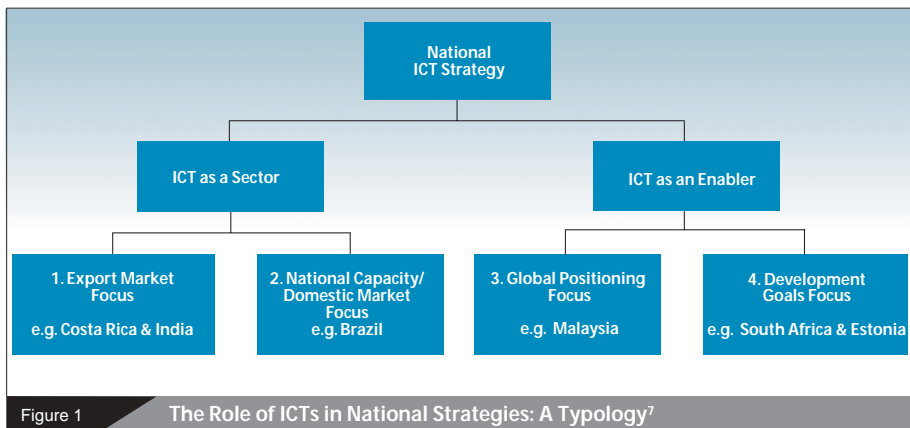
ICTs can be powerful tools for development because of their ability to facilitate information flow and to open up opportunities for development at the national and sub-national levels. They do so by increasing the effectiveness and reach of development interventions, enhancing good governance and lowering costs of service delivery.

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[7] 'Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative'; available at http://www.opt-init.org/framework/pages/2.3.html

3.2 ICTs and Specific Development Goals

Information and knowledge are critical components of poverty alleviation strategies and ICTs offer the promise of easy access to huge amounts of information that are useful directly or indirectly for the poor. It is accepted that **the digital divide is the result rather than the cause of poverty and that efforts to bridge it must be embedded within effective strategies that address the causes of poverty**. Earlier patterns of adoption and diffusion suggest that ICTs will not achieve their full potential without suitable attention being paid to the processes that they are intended to assist and the context within which they are being implemented.

However, there are many successful examples of implementation that allow for a synthesis of experiences that can lead to an understanding of how to approach the use of ICTs for widespread alleviation of poverty. For example, applying ICTs in health addresses one of the most important targets of the MDGs. With telemedicine, better information and efficient health services are made available to people in remote places. The use of ICTs in education facilitates distance learning. This strategy caters to the illiterate who are too old to go to school and enhances IT literacy in schools, which will have a multiplier effect.[8]

Digital Review of the Asia-Pacific (http://www.digital-review.org)

The Digital Review of the Asia-Pacific 2003/2004 provides a quick overview of how ICTs are being deployed across the region to facilitate socio-economic development. The *Review* covers 27 economies and focuses on nine Internet-related areas: local on-line content, on-line services, industries, key local and national initiatives, enabling policies, regulatory environment, the open source movement, research and development, and trends. There is also a special chapter on the Pacific Islands that provides an overview of 14 island economies. Thirty authors, who live and work in the region, contributed towards the research and writing of the 28 chapters found in the book. Many of them are digital pioneers who have played active roles in extending the Internet across the Asia-Pacific region.

The Digital Review of the Asia-Pacific website provides a comprehensive introduction to this wide-ranging publication as well as updates on developments taking place in all countries covered by the Review.

3.2.1 ICTs for Health

Importance: Delivering health care with ICTs enables health care professionals and institutions to address the critical medical needs of rural communities, especially those in remote locations and those that lack qualified medical personnel and services.

Use: ICTs are being used in many developing countries and communities to facilitate remote consultations, diagnosis and treatment. Basic data is collected and conveyed over the Internet from primary health centres and doctors, to medical

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[8] ICT for Poverty Alleviation Framework On-line; available at http://rogharris.org/ ICTforPovertyAlleviationFramework.pdf

specialists who analyse the data and respond with basic diagnostic results and, in some cases, prescriptions, thus sparing patients from having to make an arduous journey to a medical facility in the city. Also, a number of countries (especially in Africa) have invested in ICTs to improve the administrative efficiency of their public health system through the streamlining of medical procurement or the creation of patient history databases.

Case Study—Bhutan: Telemedicine: Easy Access to Health Services

Objective
To provide rural communities with access to health services, especially areas that are physically inaccessible or those that take days to travel to.

Description
The Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) is working on ways to implement the concept of using the Internet. Medical officials in connected hospitals can transfer electrocardiogram (ECG) and X-ray reports, and consult with specialists through email. The Division of Information Technology (DIT) is working on a project to help the JDWNRH in implementing the further use of telemedicine. Although the hospital already has technical facilities like video conferencing, it lacks technical capability. Hence, technical support is offered for hospitals to make their own websites and information centres, through which they can disseminate all health-related information.

There are two different kinds of technology that make up most of the telemedicine applications in use today:

- Store-and-forward is used for transferring digital images from one location to another. A digital image is taken using a digital camera and then sent to another location. The image can be transferred within a building, between two buildings in the same city, or from one location to another anywhere in the world.
- Tele-radiology, the sending of X-rays, CT scans and other medical reports is the most common application of telemedicine in use today.

Providing health care services via telemedicine offers many advantages:

- It can make specialized care more accessible to the public.
- On-line consultations from a rural clinic to a specialist can reduce travel time and associated costs for patients.
- It also opens up possibilities for rural health practitioners to continue their education and training.

Case Study—India: Using PDAs to Meet Rural Health Care Needs

Objective
To meet rural health care needs through the use of Personal Digital Assistants (PDAs).

Description

The Andhra Pradesh government and a local software solutions company have designed a package that will use mobile computing devices to help meet the health care needs of rural people.

The staff of Primary Health Centres (PHCs) are equipped with PDAs as they visit the remotest villages. Important health care information on pregnant women, infants and children; incidence of diseases and relevant treatments; planning preventive and remedial measures, etc., are then keyed into these digital assistants. When the PHC staff return to the primary health centre, the information is fed into desktop computers and then transferred to the district-level and state health commissioner's office using the available network.

3.2.2 ICTs for Education

Importance: The use of ICTs in education aims to improve the quality of teaching and learning as well as democratize the access to education.

Use: The Internet enables students and teachers to have access to vast amounts of up-to-date information and knowledge not only from traditional sources such as libraries, but also from museums, research centres and government institutions. The many multimedia learning materials that are now available are engaging for learners and encourage learning by exploration (discovery and experiential learning). The learning environment is expanded significantly with students now able to connect with each other, with their teachers/instructors, and with other experts through email, conferencing, message boards and e-forums.

Moreover, appropriate use of ICTs in the classroom fosters critical, integrative and contextual teaching and learning; develops information literacy (the ability to locate, evaluate and use information); promotes teaching across the curriculum; and enables students to apply abstract concepts learned in class to real-world problems. Also, ICT-enhanced modes of education such as distance education and on-line learning, make possible continuous teacher training and student learning, Thus, it improves the overall efficiency of the delivery of education in schools and educational management institutions at the national, state/provincial and community level.

Case Study—South Korea: Virtual Education

Objective

To extend the pervasive use and penetration of ICTs in South Korean society to the higher educational system.

Description

South Korea currently has 15 single mode, virtual universities that offer *only* ICT-based courses. These include the Korea Cyber University, the Korea Digital University and the Open Cyber University that specializes in life-long learning and vocational education. This is based on a deliberate strategy to prevent unnecessary competition with more established campus-based universities.

Courses offered cover a wide range of fields including technology, management, law, languages, social sciences, education and theology.

The accelerated adoption of virtual education in South Korea was a result of deliberate planning by the government. The Virtual University Trial Project (VUTP) was launched in 1988 and based on its experience, detailed criteria for establishing virtual universities in South Korea were added to the Life-Long Education Law. Participating institutions experimented with various technologies such as satellite broadcasting, videoconferencing, video-on-demand, intranets and the Internet.

Source: Jung, In: Sung, *Virtual Education at the Tertiary Level: The Experience of Korea;* available from http:/www.TechKnowLogia.org

3.2.3 ICTs for Economic Opportunity

Importance: ICTs can spur growth, create jobs for the poor, improve market access, contribute to income generation and enhance rural productivity.

Use: The economic contribution of ICTs is two-fold—income generation and poverty reduction. ICTs enable people and enterprises to capture economic opportunities with a view to increasing process efficiency, promoting participation in expanded economic networks and creating opportunities for employment.

ICTs can enable solution-sharing among local people and communities, providing access to practical information on such matters as small-sized business accounting, weather trends or best farming practices. In addition, they can:

- facilitate global connectivity, resulting in new ways of creating and delivering products and services on a global scale; and
- provide developing countries with access to new markets and new sources of competitive advantage to boost income growth.

Case Study—India: The Warana 'Wired Village' Project

Objective
To increase the efficiency and productivity of the sugar cane cooperative and to provide a wide range of information and services to 70 villages around Warana, including information in the local language about crops and agricultural market prices, employment schemes from the government of Maharashtra and educational opportunities.

Description
This project was initiated in 1998 by the Prime Minister's Office Information Technology (IT) Task Force. There are 54 functioning village information kiosks that facilitate the sugar cane production process at three stages: first, during the yearly registration of plantations when changes to property are recorded; second, during the issuance of harvesting permits; and third, during collection of payments. Farmers can go to the village

information kiosks to receive payment slips. The sugar cooperative pays them for their crops in four instalments that are credited directly to their bank accounts.

The cooperative publishes payment dates in a local paper, so farmers know when it is their turn to go to the kiosks. Moreover, farmers can purchase fertilizer at deposits located next to the kiosks in cash or using credit. If they buy using credit, they get a receipt for their purchase at the kiosk. Money spent on transport of the crop to the sugar factory is also entered into the system. Depending on the size of the village served by a kiosk, between 30 and 100 farmers visit the kiosk daily. Village kiosks have a PC with a printer and most are connected to the sugar administrative building via wireless telephony. Kiosks also have email and Internet access.

The project was jointly executed by the National Informatics Centre (NIC), Planning Commission, Government of India; the Directorate of Information Technology, Government of Maharashtra and the Warana Sahakari Dudh Utpadan Prakriya Limited, Warana Nagar, Maharashtra, at a cost of US$600,000.

Of this total cost, 50 percent has been borne by the Central Government of India, 40 percent by the Government of Maharashtra and the remaining 10 percent by the Warana Group of Societies or the Warana Vibhag Shikshan Mandal. The NIC was responsible for the design, development and implementation of the Warana Wired Village Project. They were also responsible for the user-level training on application software.

Result

The project has increased the efficiency of the sugar cane growing and harvesting process, both in terms of time saved by the farmers on administrative transactions and in terms of monetary gains. Before computerization, it took several days for farmers to find out how much they had spent and how much they had earned during the harvest; now all it takes is a visit to the village kiosk. Also, as a result of computerization, fertilizer stocks are now smaller and better managed, which is said to have brought savings of about US$750,000 to the cooperative.

3.2.4 ICTs for Empowerment and Participation

Importance: The process of empowerment allows citizens to secure, change and improve their lives by making decisions and utilizing tools to create a better present and future.

Use: ICTs can contribute to fostering empowerment and participation by:
- making government processes more efficient and transparent by encouraging communication and information sharing among people and organizations, as well as within the government; and
- participatory mechanisms such as electronic forums and bulletin boards that enable participation in decision-making, thereby making a democratic process possible. This is especially relevant for marginalized communities and groups such as ethnic minorities, women and youth. They can share and

exchange information of mutual interest, strengthen their collective power and shape their own development solutions.

Case Study—Sri Lanka: Computerized Community Radio Operations

Objective

To strengthen communication and information facilities in the local communities by offering basic tools for introducing and managing community-centred development and change.

To facilitate, through community radio, increased community participation in designing, implementing and evaluating area-based growth and an equity programme under which poverty reduction has become a major focus.

Description

The President of Sri Lanka declared open the Uva Community Radio located in Badulla, one of the most underdeveloped districts in the country. The radio station caters to three districts and has organized 268 'Knowledge Societies' around its broadcast programmes.

The Community Radio was established by the United Nations Educational, Scientific and Cultural Organization (UNESCO) with funding support from the UNDP. It utilizes the most modern, low-cost digital production solutions for community broadcasting. UNESCO has provided the expertise to design the radio station and a desktop-based programme recording and editing system, which can be used in the villages under difficult conditions. Twenty rural broadcasters have been trained in using computer-aided programme productions for broadcasting and plans are underway to convert the radio station into a community multimedia centre (CMC).

3.2.5 ICTs and Gender

Importance: Information technology can be an important catalyst of transformation in the economic, social and political lives of women. ICTs can empower women by providing access to information and communities, and income-generating opportunities.

Use: ICTs can be used to:
- provide education and training in specialized skills;
- create a channel for women's economic independence by providing avenues for income generation and employment opportunities;
- provide access to information about reproductive health, diseases and needs of children, and other localized information; and
- increase women's bargaining power through group action or special interest groups.

Women's ability to take advantage of ICT opportunities is contingent upon enabling social, economic and telecommunications policies, including those leading to increased educational levels and the extension of communication infrastructure. To date, developing countries have implemented few concrete

policies to promote gender equity in ICT use. However, as most developing countries are just beginning to devise national ICT policies, the time is right for ensuring the inclusion of gender concerns. One way for this to occur is by sensitizing policy-makers to ICT issues that affect women.

Case Study—India: Barefoot Managers On-line

Objective

To enhance the IT capacity of women organizers and leaders and to strengthen through electronic networking, the micro-enterprises of Self-Employed Women's Association (SEWA) members and the connections between the various cooperatives working in different sectors and areas.

Description

Founded in 1972 and now with a quarter of a million members, SEWA is an NGO consisting of women working in the informal sector in Ahmedabad. Through the establishment of Technology Information Centres in Gujarat, computer awareness training and basic computer skills are provided by distance learning mode for SEWA's 'barefoot managers'.

The first distance education training was on women's leadership role in regenerating forests. The centres make use of SEWA's Satcom facility, a satellite-based communications network that sends television signals from an earth station to a geo-stationery communication satellite and offers two-way communication possibilities. The system gives community groups quick and easy communication with block- and district-level functionaries.

3.2.6 ICTs and Youth

Importance: Young people can harness the power of ICTs to assure opportunity, empowerment and inclusion for all. Capacity-building initiatives need to be broadened from a narrow perception of ensuring ICTs for education and targeting only primary and secondary school students. Efforts need to be made to provide re-skilling and training of the youth to ensure participation in a workforce that is increasingly demanding ICT literacy. Income-generating initiatives should be encouraged to promote adoption and innovation among the youth. By ensuring that the future generations are taken into account in ICT policies and e-strategies, nations can ensure that ICT applications have a constant pool of knowledge resources to tap in the future, while also encouraging innovation and creativity.

Use: The creation of websites and e-forums has enabled on-line youth communities to be built across the nation. These youth communities convey and share their thoughts and views on social, political and economic issues without requiring or relying on mainstream media that tend to marginalize their voices. In addition, on-line youth communities have fostered on-line entrepreneurship, which enables networking among members. The lack of financial and marketing resources of youth is addressed by easy-to-use on-line networks of contacts and databases of information.

3.2.7 ICTs for the Environment

Importance: By improving monitoring and response systems, facilitating environmental activism and enabling more efficient resource use, ICTs can make a valuable contribution to sustainable environmental management.

Use: Through ICT-enabled monitoring of ecological conditions, prevention and mitigation measures can be deployed. In addition, ICTs can be deployed to monitor and respond to environmental disasters.

- National development and environmental policies depend on the expert analysis of information that is increasingly supported by ICT applications. For example, remote sensing has been fundamental to the identification of environmental problems, as has computer modelling to the understanding of the origins and evolution of such problems.
- The broader discussion of development and environmental issues that often drives national policies is also increasingly facilitated by ICTs. Electronic media have increasingly been responsible for public education about the environment and sustainable development.

3.3 Conclusion

Harnessing the power of ICTs can contribute substantially to realizing national developmental goals either directly (for example, through greater availability of health and reproductive information, training of medical personnel and teachers, giving opportunity and voice to women, expanding access to education and training), or indirectly (by creating new economic opportunities that lift individuals, communities and nations out of poverty).

How to Create a Strategic ICT Framework for Development

4.1 Overview

National governments and ICT for development agencies need to conceptualize and implement ICT4D initiatives and strategies within a structured conceptual framework to ensure a holistic approach that addresses appropriate needs and that enables social and economic development to reach every member of the population.

4.2 Digital Opportunities Initiative (DOI) Framework

One of the more popular approaches within the field of ICT4D has been the Strategic Compact as outlined in the Digital Opportunities Initiative Report.[9] The report emphasizes five key interrelated strategic intervention points: policy, infrastructure, enterprise, human capacity, content and applications (referred to as components of the dynamic). The key characteristic of this approach is its recognition of the need for flexibility with importance placed on different components depending on the region and the type of project. Strategic implementation will focus on each of the five components and subsequently on each of its specific sub-components. This enables policy makers and stakeholders to adopt and adapt them to meet local priorities and conditions, enabling the formulation of an approach that is not tied to specific development paths.

4.3 Strategic Intervention Points

The Sourcebook utilizes the DOI Framework and makes several key suggestions on possible approaches that can be undertaken by parliamentarians and policy makers to implement strategic intervention policies.

4.3.1 Policy

4.3.1.1 Transparency and Inclusion

Strategic Area / Objective

These enable the expansion of ICT applications and facilitate consumer and citizen input into the governance process.

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[9] Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative, July 2001, available at http://www.markle.org/news/onepage/onepage.html

- Recognize the importance of an enabling environment for the success of ICT4D.
- Engage and facilitate consultative processes with all stakeholders in the development of national strategies, agendas and policies.
- Publish and share national ICT policies and agendas in the public domain. Ensure access to decrees, policy papers and other information.
- Encourage the process of interaction with the public via email and forums on the Internet.
- Conduct assessments of public perception on levels of transparency and efficiency of civil servants.
- Address grievances at the ministerial level.
- Review the pros and cons of having a domestic monopoly of the telecommunication industry. Keep in mind that needs differ at different levels of national development.
- Improve accessibility to national public administration information, especially to citizens who live in rural areas.

4.3.1.2 Regulatory Framework

STRATEGIC AREA / OBJECTIVE

De-regulation and liberalization result in rapid market expansion.

APPROACHES/ CONSIDERATIONS

- Careful planning on phases of liberalization and de-regulation has to be undertaken in order not to fall under the control of foreign corporations, as governments depend on domestic telecommunication revenues to fund national programmes.
- Initiate an objective study to determine at what level and in what areas de-regulation and liberalization should be undertaken to ensure that the present and future needs of the populace are met.

4.3.1.3 Institutional Capacity

STRATEGIC AREA / OBJECTIVE

Knowledgeable policy makers and institutions are necessary in governance.

APPROACHES/ CONSIDERATIONS

- Establish a body or agency to monitor the telecommunications and ICT industry.
- Establish a forum for engagement between consumers, the private sector and government to address issues.
- Ensure that a competitive environment exists if the telecommunication market is de-regulated and that the public is not at the losing end due to high costs.
- Re-visit legal frameworks to ensure their continued applicability.
- Set up community networking to democratize access to local and international information.

4.3.1.4 Security

STRATEGIC AREA / OBJECTIVE

Develop an environment of trust and security.

APPROACHES/ CONSIDERATIONS

- Establish national security policies and appropriate cyber laws.
- Explore the feasibility of implementing digital signatures.

4.3.2 Infrastructure

4.3.2.1 Focused Capacity

STRATEGIC AREA / OBJECTIVE

Develop a strategically focused network. Infrastructure capacity for key sectors.

APPROACHES/ CONSIDERATIONS

- Prioritize national sectoral policies.
- Establish industrial e-parks for selected sectors of the economy/industries.
- Establish regulatory frameworks to monitor telecommunication services and costs.
- Reduce taxation of ICT-related components, products and services.
- Prioritize national-level initiatives to capitalize on the infrastructure envisioned.
- Plan and monitor the national telecommunication infrastructure grid.
- Establish regional and domestic telecommunication partnerships/peering/ hubs.
- Support national and regional as well as zonal, coordination, cooperation and standardization of regulations and legislation.

4.3.2.2 Universal Access/Services

STRATEGIC AREA / OBJECTIVE

Promote ubiquitous access.

APPROACHES/ CONSIDERATIONS

- Promote community telecentres/projects in rural areas to ensure last mile connectivity.
- Encourage pilot projects with innovative technologies.
- Explore partnerships with the private sector and encourage telecommunication firms to explore/expand into rural areas for tax rebates.
- Establish partnerships with NGOs engaged in awareness and innovative projects.
- Ensure that telecommunication costs are affordable to the masses.
- Improve communication and information flow for better research and extension service linkages.
- Increase coordination of donors and information flow among donors.

4.3.3 Enterprise

4.3.3.1 Finance and Credit

STRATEGIC AREA / OBJECTIVE

Provide access to funding and credit financing.

APPROACHES/ CONSIDERATIONS

- Encourage foreign and domestic venture capital funds.
- Establish micro-finance opportunities via domestic industrial or development banks.
- Explore partnership possibilities with the private sector in establishing critical infra-structure.

4.3.3.2 Property Rights and Commercial Law

STRATEGIC AREA / OBJECTIVE

Encourage compliance with international norms.

APPROACHES/ CONSIDERATIONS

- Establish and implement national cyber laws relating to copyright.
- Explore the use of Free and Open Source Software (FOSS).
- Engage in technology transfer blueprints in partnership with foreign corporations and research centres.
- Promote awareness of the importance of Intellectual Property Rights among ICT corporations.

4.3.3.3 Fair Tax Regime

STRATEGIC AREA / OBJECTIVE

Provide incentive for investment and entrepreneurial activities.

APPROACHES/ CONSIDERATIONS

- Reduce taxation on ICT-related components, products and services.
- Establish a forum for engagement between consumers, the private sector and government to address issues.
- Provide incentives on innovative products, infrastructure and services targeted towards rural area development.
- Consider Pioneer Status for critical ICT industries.

4.3.3.4 Access to Relevant Global and Local Markets

STRATEGIC AREA / OBJECTIVE

Encourage outward and inward flow of trade.

- Encourage participation in international and regional commercial conferences and trade fairs in relevant sectors.
- Encourage regional partnerships/portals for SMME products and services in specific industries (for example, tourism).
- Encourage web presence of domestic corporations and research centres.

4.3.3.5 Increasing Efficiency and Reach of Local Business

Strategic Area / Objective

Increase competitiveness.

Approaches/ Considerations

- Encourage the use of internationally accepted standards of accounting, logistical requirements, customer service and response time.
- Encourage government and national corporations to engage in computerization processes.

4.3.3.6 Demand Stimulus

Strategic Area / Objective

Increase demand for ICT infrastructure and services.

Approaches/ Considerations

- Promote the benefits of ICTs to private sector and academic institutions, and encourage computerization.
- Require e-procurement for government.

4.3.4 Human Capacity

4.3.4.1 Knowledge Workers

Strategic Area / Objective

Develop a critical mass of core professionals with technical capabilities to provide and maintain ICT infrastructure and related ICT services to adapt new technologies to local requirements.

Approaches/ Considerations

Educational Institutions

- Promote ICT-related courses at university/college level and expand the base of supportive certificate and diploma level at college level.
- Create or promote the establishment of specialized ICT centres in institutes of higher learning.
- Begin basic ICT skills workshops for all students at tertiary level.

- Encourage national-level ICT awareness programmes, especially among primary and secondary school students.
- Provide equitable remote access to resources in support of both distance education and the strengthening of local educational capacity.
- Connect schools, universities and research centres to national and international distance education facilities, national and international databases, libraries, research laboratories and computing facilities.

Private Sector

- Encourage corporations to appreciate ICT competent staff and conduct/sponsor ICT training for staff members/professionals.
- Emphasize re-skilling of present support staff in basic ICT skills.
- Encourage assessment and promotion of civil servants to include ICT competency.
- Begin basic ICT skills workshops for all civil servants to be conducted by the designated ICT officer in every ministry.
- Share the e-government experiences of other developing countries at the senior civil servant level.

4.3.4.2 Intermediaries and Technology Users

STRATEGIC AREA / OBJECTIVE

Institutions that link technology to end-users are critical, especially in skills creation and development.

APPROACHES/ CONSIDERATIONS

Educational Institutions

- Encourage ICT research and development and partnership with the private sector and international educational/research centres.
- Encourage student placements in international/domestic ICT corporations.
- Provide research and development grants to competing research centres on identified specialized areas.

Knowledge Workers

- Attract skilled ICT workers from abroad by offering benefits, ease of immigration, quick office set-up, and packages to facilitate participation.
- Encourage conferences, workshops and seminars on the latest technological issues and trends to ensure dialogue and engagement.

4.3.4.3 Entrepreneurs

STRATEGIC AREA / OBJECTIVE

Develop a critical mass of motivated entrepreneurs with business expertise to leverage new opportunities.

Private Sector

- Promote the adoption of ICTs among small, medium and micro enterprises (SMMEs), which comprise the economic backbone of most developing countries.
- Encourage national-level excellence awards for innovative solutions in selected categories of the economy and social development.
- Facilitate the issuance of licenses and provide tax incentives on innovative products targeted to rural area development.
- Encourage ICT research and development via partnerships with research institutions.
- Encourage acceptance of student placements within corporations.

Public Sector

- Encourage the timely dissemination of up-to-date assessment and information on the state of ICT development, adoption and trends within specific areas in the country and worldwide (for example, agriculture, transportation, telecommunications, finance) by the respective ministries or national agencies.
- Establish incubation centres, which are especially targeted to start-up corporations and research centres. This can be done as a semi-privatized venture.

4.3.5 Content and Application

4.3.5.1 Relevance and Usability

STRATEGIC AREA / OBJECTIVE

Ensure responsiveness of ICT content and applications to local user needs and environment.

APPROACHES/ CONSIDERATIONS

- Encourage content generators (for example, local media) to provide content on the web.
- Encourage the development of 'virtual malls' showcasing storefronts and products (for domestic and international benefit).
- Encourage web hosting and server hosting services (usually within academic centres).
- Implement national-level local content/ website awards.

4.3.5.2 Language Compatibility

STRATEGIC AREA / OBJECTIVE

Ensure availability of local language fonts.

APPROACHES/ CONSIDERATIONS

- Encourage the development of local language fonts, if applicable.
- Encourage utilization of bilingual options on all government websites (for domestic and international use).

4.3.5.3 Affordability

STRATEGIC AREA / OBJECTIVE

Ensure affordable access.

APPROACHES/ CONSIDERATIONS

- Monitor telecommunication prices. Bridge differentials in urban and rural areas.
- Waive taxes on personal computers.
- Encourage flexible payment schemes for purchase of personal computers.
- Encourage the establishment of cyber cafés/telecentres.

4.3.5.4 Development Applications

STRATEGIC AREA / OBJECTIVE

Ensure appropriate application of ICT for development.

APPROACHES/ CONSIDERATIONS

- Encourage web presence for domestic corporations, academic institutions and government agencies.

4.4 National Information Infrastructure Agenda

The United Nations Economic Commission for Africa's recommendation on establishing a National Information Infrastructure can be utilized here as a guideline in approaching national strategic development frameworks. It encompasses the following:

1. Define vision, mission, strategic objectives and scope.
2. Define the institutional framework.
3. Define the regulatory framework.
4. Define the information technology business sector.
5. Define the development priorities (five-year plan, cabinet directions, etc.).
6. Define the economic and business sectors as well as the market trends.
7. Define the education and science and technology infrastructure.
8. Define needs and priorities for information, decision support, networking, information services, etc.
9. Define the data/information and decision support agencies, actors, etc., at the different levels: national, provincial, local.
10. Define the technology infrastructure.
11. Identify, formulate and develop programmes and projects.
12. Formulate strategies for the development of national information infrastructures.

13. Develop a detailed action plan, time schedule, priorities and budget.
14. Determine the implementation agencies in charge.
15. Solicit the commitment of policy makers, industry leaders, community leaders, etc.
16. Formulate a public awareness campaign.
17. Implement.
18. Monitor.
19. Evaluate.

4.5 ICTs as Tools for Development

ROLE	ISSUE	SOLUTION
Universal access of information for all/equitable access	• Barriers to universal access refer not only to the availability of telecommunications infrastructure and computing equipment. Barriers to individual access are also economic, educational and socio-cultural.	• Open information, if made available to the citizens, can help them make informed decisions in their daily life, such as on whether to invest in the share market, or to obtain services from the government. Even information about the right of citizens to government services is not easily available in some countries.
Citizen-centric governance	• Information is vital to being able to participate in the decision-making process. The use of ICTs in providing citizens with information re-defines the governance process, so that it is based more on the citizen's need for development and improvement in quality of life, rather than on control or rule.	• Providing citizens with information results in transparency in the decision-making process. It empowers the common person to expose malpractices, if any. The principle of 'access to information for all' requires a two-way process whereby the government is committed to sharing information, as well as to receiving and acting upon information received from the public.
Equal opportunity for improving the standard of living	• The ever-widening economic divide— between the rich and poor among different nations and within countries—has made	• In order to maintain a leadership position in any developed country, a business, whether large or small, must have a leadership

ROLE	ISSUE	SOLUTION
	it a major political agenda. • The inability of developing nations to improve the productivity of their people and to build avenues for them to exploit opportunities, is a major concern. • In rapidly changing business models, which are triggered primarily by the rapid spread of ICTs and knowledge-based economics, it is not clear how developing nations will be able to leverage local advantages to provide equal opportunities to their people in a global market and within the country.	position in all markets, particularly in developed global markets. The sourcing of specialized skills, manufacturing and services, is spreading globally. • The challenge of rapidly changing business models needs the greatest attention from parliamentarians. This issue requires all stakeholders to come together and think of totally new means of bargaining for an effective position in the new world economy.
Minimizing the digital divide	• It is becoming clear to developing countries that the lack of ICT infrastructure and services will rapidly isolate the economies of developing countries and put them at a social and economic disadvantage.	• Developing nations must prepare to strengthen their economies. ICTs can facilitate this by providing new opportunities in the global market, like hosting and providing call centre facilities. • Developing nations individually or as a regional group will have to devise and pursue new strategies to carve a niche for themselves in the global market with the use of ICTs as enablers.

4.6 Examples of ICT Components in Asian National Development Plans

It has been noted that most Asia-Pacific nations have begun to place emphasis on ICT4D within their respective nations. Efforts range from setting up national ICT councils, to making specific allocations in national budgets for establishing national ICT agendas and/or overarching policy frameworks that enable and provide the necessary platform for sectoral policies to be developed. Selected examples from Asia-Pacific nations indicate the growing support placed by governments on the importance of ICTs within their respective development goals.

No. COUNTRY	ICT COMPONENT/S	EXAMPLE
1. Bangladesh	Yes	The Bangladesh government established the 'ICT Policy of Bangladesh' in September 2002. For the ICT Policy of Bangladesh, see http://www.bccbd.org. The I-PRSP of Bangladesh is at http://www.erdbd.org/iprsp/iprsp.jsp
2. Bhutan	Yes	According to the Ninth Five-Year Plan (2002–2007), the goals and objectives of ICT are: (*a*) to expand telecommunication services to all districts; (*b*) to promote e-governance through the establishment of network and web portals; (*c*) to set up proper legal frameworks; and (*d*) to promote private sector participation.
3. Cambodia	Yes	The National Information Communications Technology Development Authority (NiDA) chaired by the Prime Minister was established on 23 August 2000. The responsibilities of this Authority are to formulate ICT promotion and development policy for the short, medium and long term, to implement ICT policy to ensure maximum economic growth and to monitor and audit all ICT-related projects in Cambodia. See http://www.nida.gov.kh/
4. China	Yes	The Tenth Five-Year Plan (2001–2005) attaches great importance to speeding up the development of ICT industries. It says that the promotion of the application of information technology is the key to upgrading China's industrial growth and modernization.
5. Fiji	Yes	The Fiji National ICT Council is responsible for the formulation and execution of the National ICT Strategy Plan 2003–2005 that will be incorporated into the government's Comprehensive Strategic Development Plan, and it will be reflected in Fiji's Pacific Island neighbouring countries' National ICT Strategy Plans. The four Cornerstone Programmes defined by the National ICT Strategy Plan are to promote: (*a*)

No. COUNTRY	ICT COMPONENT/S	EXAMPLE
		e-Government (ICT Services: http://www. itc.gov.fj); (b) e-Commerce (Ministry of Commerce); (c) e-Personal (Ministry of Education) and (d) ICT Industry (Fiji Trade & Investment Board: http://www.ftib.org.fj).
6. India	Yes	ICT is specially recommended as a strategy for: 1. Adult literacy / national literacy missions, teacher training and professional development of educators, managers and others. 2. Secondary education. 3. Higher and technical education. The Tenth Plan Document (2002-2007) is available at http://planningcommission. nic.in/ plans/planrel/fiveyr/welcome.html
7. Indonesia	Yes	Development and improvement of 'Information, Communication and the Mass Media', is specified as one of the key political development components. Facility and infrastructure (including communication) building is referred to as a key economic development programme. See http://www. bappenas.go.id/html/ inggris/info.asp
8. Malaysia	Yes	'Expanding the Usage of Information and Communications Technology', is listed as one of the key strategies of the Eighth Malaysia Plan (2001–2005). The National Information Technology Agenda (NITA) is available at http://www.nitc.org.my/ index. shtml
9. Mongolia	Yes	The Government of Mongolia has expressed a major commitment to the ICT industry. The main strategic document is 'ICT Vision—2010', which was officially endorsed by Parliament in 2000. In addition, there are several other strategy documents for the ICT sector, such as the 'Government Action Plan' and the 'General Plan' to develop the telecommunications sector of Mongolia by the year 2010. The National ICT Committee, composed of representatives of government, the public sector, NGOs and the education sector,

No. COUNTRY	ICT COMPONENT/S	EXAMPLE
		plays a key role in the Mongolian ICT field. The committee is headed by the prime minister and is an advisory body to the government.
10. Myanmar	Yes	The ICT Master Plan was established as the basis for all ICT development efforts in Myanmar. See http://www.myanmar.com/ IT/ IT/HTM
11. Nepal	Yes	ICT is listed as one of the important factors in Nepal's Poverty Reduction Strategy Paper (PRSP) In 2000, His Majesty's Government of Nepal announced its 'Information Technology Policy,' which has three main objectives: (*a*) to make information technology accessible to the general public and increase employment through these means; (*b*) to build a knowledge-based society; and (*c*) to establish knowledge-based industries. Currently, a draft cyber law is under development. See the National Planning Commission home page from which the PRSP can be downloaded at http://npc. gov.np:8080/ See also the website of the Ministry of Science and Technology, which is the national machinery for ICT, at http://www.most.gov. np/
12. Palau	Yes	Under its Public Sector Investment Programme 2003–2007, ICT is referred to as 'Telecommunication.' Development projects and plans include the Light Net 2000 programme, upgrading systems and improving access, a nationwide cellular system, cable TV, and getting connected to continental cables to improve ICT service options. See http://www.aptsec.org/ summit/ MinisterialMeetings/MM3/PAL-STATEMENT. htm
13. Philippines	Yes	The Medium Term Philippine Development Plan, includes 'IT21' as the ICT master plan, whose goal is to make the Philippines the

No. COUNTRY	ICT COMPONENT/S	EXAMPLE
		'Knowledge Center in Asia' by 2010. The promotion of e-commerce is enshrined in the Internet Strategy for the Philippines (ISP.com). The Government Information Systems Plan aims to achieve efficiency in all governmental activities as well as administration services through e-government by 2010.
14. Samoa	Yes	The Strategy for the Development of Samoa (SDS) for the period 2002–2004 is to set up a telecommunication regulatory framework, by establishing an ICT Council and setting up a Regulatory Commission and a Spectrum Management Agency, so as to improve infrastructure, including the installation of fibre optic technology and introduction of competition in cellular markets and in the provision of Internet services.
15. Singapore	Yes	Infocomm21 and e-government are parts of the e-Government Action Plan. See http:// www.egov.gov.sg/
16. Solomon Islands	No	The Ministry of Provincial Government and Rural Development set up the People First Network (PFnet) to explore ICT possibilities relevant to local conditions. In October 2001, the PFnet Internet Gateway base station set up Solomon's first rural community email facility. The Government plans to expand this network to over 25 PFnet-managed and many more self-funding stations. PFnet has been piloted for the 'Distance Learning Application' in partnership with the University of the South Pacific Centre in Honiara. See http://www. panasia.org.sg/grants/awards/ 0201a1 .htm and http://www. people first.net
17. Sri Lanka	Yes	ICT action plans are included in *The Future—Regaining Sri Lanka,* which reflects *A Framework for Poverty Reduction* and *e-Sri Lanka: An ICT Development Roadmap.* See http://www.regaining srilanka.org/ and http:// www.esrilanka.lk/

No. COUNTRY	ICT COMPONENT/S	EXAMPLE
18. Timor-Leste	No	Following the violence in 1999, 60-90 percent of all physical telecommunication infrastructures were severely damaged in Timor-Leste. Presently, Timor-Leste is simply restoring the landline system through a build-operate-transfer (BOT) contract, under the supervision of the Ministry of Transport, Communication and Public Works. Hence, ICT goals in the National Development Plan are not clear yet, though one of the development objectives states, '...the implementation of a telecommunications network with the capacity to satisfy the minimum tele-communication needs of the Nation.'
19. Thailand	Yes	IT2010 is a national ICT policy framework that will be used as a blueprint for ICT development during the period 2001–2010. Five strategic ICT applications are highlighted in IT 2010 as follow: e-industry, e-commerce, e-education, e-society, and e-government. In addition, there is an ICT Master Plan, which provides a strategic framework for implementation during 2002–2006.
20. Tonga	Yes	The Government of Tonga includes 'developing communication and information technology' in the National Strategic Development Plan 7 for 2001-2004. There is a Rolling Development Programme for Communication and Information Techno-logies. Tonga's 'Communication Policy State-ment' for the modernisation and restructur-ing of the communications sector details Tonga's intentions in ICT-related develop-ment initiatives. See http://www.pmo.gov.to/DeptCom.policystatement.htm#news1
21. Tuvalu	Yes	In the Action Programme for the Development of Tuvalu 2001-2010, ICT-related developments are highlighted mainly as revenue earning opportunities for

No. COUNTRY	ICT COMPONENT/S	EXAMPLE
		the government. Tuvalu has sold the rights to its international domain name code 'tv' and is using the influx of money to pay for UN membership, a new school and other infrastructure projects. See http://www.unctad.org/conference/main.htm
22. Vanuatu	Yes	Vanuatu does not have a national plan as such, but has an ongoing Comprehensive Reform Programme (CRP) enacted in July 1997. Twenty-two new laws setting an institutional framework and restructuring public service have also been passed. In November 2002, a Prioritised Action Agenda (PAA) was put together by stakeholders to formulate and articulate medium term priorities of the government, and to sequence and resource policy interventions to realise the development goals of the State. In this plan, ICT comes under telecommuniations with the aim for all citizens to have telephone access within an hour's walking distance. Reference Web Site: http://www.tvl.net.vu/ english/internetschool.htm
23. Viet Nam	Yes	The Seventh National Socio-Economic Development Plan 2001-2005 mentions the necessity of developing ICT-related industries. The 'Master Plan for Information Technology Use and Development in Viet Nam by 2005' was approved in 2002

Source: Organization for Economic Co-operation and Development, Global Forum on Knowledge Economy: Examples of Information and Communication Technology (ICT) in National Development Plans as of August 2003.

The Role of Parliamentarians

The role of parliamentarians in shaping the information society using ICTs as tools is to provide the vision and the leadership. The key components that parliamentarians may consider placing priority on are as follow:

1. Legislate laws and policies
- Parliamentarians are responsible for keeping track of changes taking place in society, especially at present where social changes are often driven by technological breakthroughs.
- Parliamentarians must realize that in order to navigate society into the Information Age, a whole new set of laws and policies has to evolve. Good and practical policy is one of the key instruments for propagating ICTs. Only a continuous effort from well-informed parliamentarians can ensure that developing countries do not fall into the technology trap and increase the digital divide, instead of using ICTs as a development tool for all.

Local considerations play a very critical role in deciding the path to be pursued. Hence, continuous evaluation and re-focusing of policy is crucial for effective policy formulation. Citizens' perspectives and views have to be given priority to ensure sustainable ICT-based development. Parliamentarians, as representatives of the people, have to show the vision to achieve the desired objectives.

2. Monitor the implementation of laws/policies
- Laws and policies are only as good as their implementation. Often, while enough effort is put into formulating policies and laws, the efforts at implementation are not the same. The effort required for implementation is much greater and more time-consuming than policy formulation itself. If the effort is not made, a large gap between what one wishes to achieve and what can actually be achieved is created. This can lead to a slowing down of national efforts. A realistic policy framework is vital.
- Following up and effective monitoring of the policy framework is another way of moving society into the Information Age. It is, therefore, important for parliamentarians to continuously look at the operational and implementation aspects of ICT policies.

3. Represent the interest of the masses in development
Development is the process of building up the capabilities of citizens and providing them with opportunities to use these capabilities to improve their

livelihoods. These opportunities include new services, markets and products created through the introduction of new technologies. History has shown that the benefits of such technological advancements have often not been evenly distributed—they have favoured governments or businesses rather than citizens. With the liberalization of economies in many countries, the business sector is increasingly taking part in the development of such opportunities. The conventional role of government is to provide effective control in society, where the objective of business is profit. Citizens often find their objective of improving the quality of life getting sidelined. This is due to the fact that government and business are organized institutions and citizens do not have the means to organize their vision or objectives. Legislature, as a representative body of the people, is the most appropriate institution to fulfil the needs and aspirations of the people.

- ICTs are the most powerful tools innovated so far and they open up unlimited opportunities. It is critical that the goals of citizens are taken into account in the ICT policies and laws formulated in any country.

4. Work towards minimizing gaps in society (Digital Unite)

ICTs are important productivity tools for knowledge workers and service workers, who are fast becoming the dominant groups in society. Increases in productivity can lead to improvements in the standard of living. Productivity in conventional sectors like agriculture, manufacturing, construction and transportation has increased at an annual rate of 3-4 percent compounded over the last 125 years. This represents a 45-fold growth in overall productivity in developed nations. However, developing countries have not been able to keep pace with the increase in productivity, thereby causing an 'economic divide'. While productivity enhancement in conventional sectors in developing countries is still an important issue, it is not so for developed countries where not enough people are employed in this sector due to the high degree of automation.

5. Use ICTs for local development

- This is the best way for parliamentarians to gain first-hand experience of how ICTs can lead to social change. The use of ICTs as tools for local project management provides experience of good governance, productivity improvement and citizens' participation in local affairs. This gives local talent ideas and opportunities to take the initiative, thereby creating growth opportunities.

The Government as a Model User

Subash Bhatnagar[10] notes that e-government initiatives in the Asia-Pacific region are catalyzed by three different scenarios, which take place in varying degrees in different economies in the Asia-Pacific. First, it has been noted that e-government has been driven by a vendor/consultant push that stands to benefit from increased investments in hardware and consulting. Second, e-government has been driven by a growing demand for better services from citizens, who now experience vastly improved services from the private sector. Third, e-government has been a top-down, government-driven approach by national leaders, who take charge of national IT councils and who have identified e-government as a priority service to be rendered.

It must be noted that although the motivations differ within economies, the results of these actions can be categorized as follows:

ROLE	PROCESS
Championing ICT for development initiatives	• Although ICTs are facilitating the transition from industrial-based economies to knowledge-based societies, a large number of people are not being covered by the beneficial impact. This wide disparity in who benefits from ICTs underscores the uneven progress of economic development, which in turn highlights the critical role of government in the Information Age.
	• In civil society, governments play a very important role in providing social and economic order. As they are regulatory in nature, governments generally tend to be conservative in adopting changes arising out of technological innovations, especially when technological changes are not well understood and tend to affect the existing regulatory framework. The government

[10]Bhatnagar, S. *Role of Government: As an Enabler, Regulator, and Provider of ICT Based Services,* presented at the Asian Forum on ICT Policies and e-Strategies, 20-22 October, Kuala Lumpur, Malaysia. Available at http://www.apdip.net/asian-forum/papers/session3.pdf.

ROLE	PROCESS
	should take the lead in defining the new social order and ensuring that society moves smoothly into it.
Stimulate and/or foster the ICT industry	• Government interventions can create a better local and global business environment. An example of the government's role in ICT economic development is its promotion of e-commerce through on-line procurement procedures (B2G) and on-line provision of public services (G2C), to spur the private sector to go online and create a critical mass of consumers.
Strengthen good governance	• New ICTs can also make a significant contribution to the achievement of good governance goals. e-Governance can make governance more efficient and more effective.

6.1 Goals of e-Government

Five broad categories of goals commonly pursued through e-government have been identified. These goals go beyond mere efficiency of government processes to overall reform and development. Ultimately, the goal of e-government is to improve and enhance the interaction between three main actors in society—government, citizens and business—in order to stimulate political, social and economic progress.

It must be noted, however, that these goals are not written in any particular order of importance. It is the country and its leaders that must determine their priorities and the goals that they are trying to achieve.

GOALS	PROCESS
Creating a better business environment	• Government is one of the prime customers of ICT goods and services in providing G2C and G2G services. This mode of procurement works as a demand stimulus for the business sector. • e-Government can encourage more investors/investment by cutting out redundancies in procedures and emphasizing immediate and efficient delivery of services. • This goal is highly dependent on a country's industrial strengths and competitive advantage.

	• Once key sectors have been identified, they should be incorporated in the e-government strategy for agencies, the bureaucracy and public services to promote these sectors.
Customers on-line, not in line	• This refers to the effective delivery of public goods and services to citizens accompanied by quick government response—with minimal direct intervention of a public official.
Strengthening good governance and broadening public participation	• Promoting transparency and accountability in government through the proliferation of ICTs in management and operations opens up opportunities for citizens to be more actively involved in the policy- and decision-making processes of government.
Improving the productivity and efficiency of government agencies	• Re-engineering processes and procedures to cut red tape, facilitate delivery of services, increase productivity, build accountability, increase transparency of the bureaucracy, and increase savings are multiple benefits inherent in e-government.
Improving the quality of life for disadvantaged communities	• ICTs enable government to reach out to marginalized groups/communities. Improving their quality of life means not only being able to involve these groups and empower them through their participation in the political process, but also reaching out to them in order to deliver much-needed public goods and services.

Source: Pacific Council on International Policy. [11]

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e-Government — 10 Questions That Should Be Asked

1. Why are we pursuing e-government?

2. Do we have a clear vision and priorities for e-government?

3. What kind of e-government are we ready for?

4. Is there enough political will to lead the e-government effort?

5. Are we selecting e-government projects properly?

6. How should we plan and manage e-government projects?

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[11] http://www.pacificcouncil.org/pdfs/e-gov.paper.f.pdf

7. How will we overcome resistance from within the government?

8. How will we measure and communicate progress? How will we know if we are failing?

9. What should our relationship be with the private sector?

10. How can e-government improve citizen participation in public affairs?

Source: Pacific Council on International Policy; available at http://www.pacificcouncil.org/pdfs/e-gov. paper.fpdf

Case Study—Singapore: Increased Investment through e-Government (www.gebiz.gov.sg)

Objective
To promote and facilitate e-commerce through the simplification of government procurement and tender activities.

Description
Set-up in 2000, the Singapore Government's Electronic Business Centre (GeBiz) is committed to achieving consistency in procurement practice and greater transparency in transactions, thereby stimulating the development of e-commerce in Singapore.

GeBiz is a one-stop e-commerce website that suppliers can access for a range of business opportunities available in the public sector. Besides viewing tender notices, suppliers can also download tender documents posted by the government procurement agency. In addition, suppliers are able to see Invitations-to-Quote (ITQs) posted by government agencies. Suppliers registered as GeBIZ Trading Partners can respond to these ITQs and carry out the actual procurement transactions on-line. The system will alert GeBIZ Trading Partners of any purchase orders issued to them through email.

6.2 How ICTs Facilitate Good Governance

Successful application of e-governance principles will enable the achievement of the following:

- Enhancing democratic and parliamentary institutions, mechanisms and practices (for example, parliamentary on-line services, networks and information-sharing and the creation of government websites).
- Strengthening transparency and accountability (including a decentralization of government functions, on-line public tenders and procurement, land transactions and Internet transmission of meetings of legislative and executive bodies).
- Improving government activities (by creating inter-ministerial networks) and aid coordination (through on-line observatories with consultation and posting of data, documents and studies).

- Improving the delivery of government services (by opening public cyber kiosks; posting on-line basic documents, forms, statistics and bulletins; providing on-line national registers; and options to pay government fees and invoices).
- Fortifying the observance of human rights through monitoring, networking among interest groups, awareness programmes and on-line education.

Case Study—The Philippines: Computerizing the National Bureau of Investigation (NBI)

Objective

To improve efficiency and transparency by computerizing the NBI.

Description

The Philippine NBI used to be the object of many complaints because it took at least three days to secure an NBI clearance. Computerizing the NBI system and providing easy access from NBI kiosks in Manila's shopping malls, has reduced the clearance processing time to five minutes.

Results

Benefits include:

- **A two-fold increase in revenue.** The issuance of clearances is the NBI's largest revenue earner. The agency used to earn only Php150 million a year due to slow processing of applications. With computerization, the agency now earns more than Php 270 million a year.
- **Significantly reduced graft and corruption.** The renewal kiosks have significantly reduced graft and corruption by reducing opportunities to bribe employees to 'facilitate' the approval process or falsify documents.
- **Expanded public service.** The NBI clearance renewal kiosks can now issue more than 30,000 clearances to job seekers and visa applicants every day. Being mall-based, these kiosks are more accessible to the public.
- **Decongestion of the main NBI compound.** The new NBI computerization system has effectively decongested the Bureau of the long line of clearance applicants. From 30,000 people a day, the applicants' queue has been reduced to 4,000 people. Ultimately, the NBI hopes to enable applicants to secure their NBI clearances from the comfort of their homes by logging in to the NBI website.

Case Study—South Korea: Greater Openness of Local Government

Objective

To address corruption and lack of accountability in the issuing of local government licenses.

Description

Corruption and lack of accountability were concerns at the highest level in the Municipal Government of Seoul. This led to the development of an anti-

corruption web portal called the Online Procedures ENhancement for Civil Applications (OPEN) System. The portal provides **citizens** with the overall goals for the anti-corruption drive and an explanation of the rules and procedures for permit/license application and processing.

Result
A dramatic decrease in corruption has been reported.

6.3 Assessment of Web Presence of Parliamentary Associations and National Assemblies

Almost all national parliamentary assemblies and regional parliamentary associations have placed information about their respective organizations on the web. However, many regional parliamentary associations do not include hyperlinks with member state parliaments and vice versa.

According to an on-line governance survey by the Commonwealth Network of Information Technology for Development Foundation in 2000, almost 72 percent of developing countries have government websites (ranging from 70 percent in Africa to a 100 percent in the Arab States, Latin America and the Caribbean).

6.3.1 Purpose and Scope of Information

At first glance, the Internet seems to have given governments an opportunity to engage the public in the democratic process. However, although a majority of their websites have basic information, such as an overview of the concerned organization, its mission, history, officers and contact details, only a handful of parliamentary associations and national assemblies have utilized the web to provide information pertaining to internal reports, assessments, draft resolutions and minutes of parliamentary meetings. There are few websites that offer information on dates of public events, the agenda of the plenary chamber, information about the people's representatives, lists of standing committees and their composition, inter-parliamentary relations, election data and databases of subjects and speakers, text of publications and plenary transcripts.

6.3.2 Transparency and Governance

There is very little effort to enable elected representatives to consult, through the Internet and email, the electorate/communities they represent, to ensure that better decisions are made. Also, the Web has not been used much for publications, provision of background information on specific issues, two-way interaction, opinion polls, submission of items to parliamentary agendas, and improving the parliament's representative function and its accountability to the electorate. Certain establishments have argued that direct email access to elected representatives has led to a landslide of unwarranted emails from organized lobby groups, which clogs up office systems.[12] It has also been said that this is a 'direct

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[12] Jackson, N. Vote Winner or a Nuisance: Email and British MPs' Relationship with Their Constituents; available at http://www.psa.ac.uk/cps/2003/nigel%20jackson.pdf; retrieved 21 January 2004.

challenge to the very principle of representative democracy, whereby the web becomes a mechanism to permit the voices of those that use it most effectively to become dominant in policy-making.[13]

However, this is clearly a flaw in the policy-making process and administrative management and should not be accepted as an excuse for not exploring alternative means to enhance interaction between parliamentarians and the electorate. What is inarguable is that the aims of increasing administrative efficiency, information access and dissemination, and enhancing interaction with citizens through e-parliament, are at the moment far from reality in the Asia-Pacific region. While donor agencies have sought to encourage parliamentarians to use ICTs to increase efficiency and incorporate governance principles in the adoption of e-government initiatives, there has been little effort to extend this premise to include parliamentarians who at the outset might not be part of the ruling government's e-services website.

6.3.3 Language

Almost all websites surveyed provide information in English. A few regional and national assemblies either provide bi-lingual capabilities with English as an option, or restrict information to the dominant local languages.

6.4 Critical Success Factors

- **Effective information management**—Parliamentarians need to continue exploring avenues of correspondence with their electorate. Effective, immediate and proactive responses must be emphasized. The use of email to fulfil this task is increasing in countries with high levels of Internet connectivity.
- **Information**—Representatives need to be able to access various sources of information (the World Wide Web, government intranets and CD-ROMs) on a wide range of topics to be able to understand the needs of their electorate.
- **Networking**—Representatives need to be able to develop and tap into networks to enable them to gauge opinion on issues. Personal websites can create a focus for contact and communication. These can even be used to host discussion groups on particular issues.
- **Parliamentarian Action**—Efforts have to be undertaken to ensure that the e-government process itself establishes a two-way communication process—that is the dissemination of government policies and gauging of reactions, feedback and input from citizens.

e-Asian Parliamentarians Forum (www.eAPF.net)

The e-Asian Parliamentarians Forum was developed to heighten awareness among Asian parliamentarians of the role of ICTs today in assisting the process of national human development. The website provides several tools for parliamentarians and senior government officials, to help them enhance their

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[13] Ibid.

effectiveness as decision makers. These tools include:

- a 'Policy Watch' repository that comprises ICT policy documents from countries in Asia with regular policy updates from the respective regions;
- a collection of case studies and best practices showcasing ICT4D initiatives from within the region;
- links to relevant ICT4D websites;
- links to National Parliamentary Assemblies; and
- links to Parliamentary Associations.

The website also features an on-line forum designed to facilitate networking and dialogue among users.

Open Standards, Open Source

7.1 Definition of Open Source

The last decade has seen a new initiative in the area of software development called the Open Source Movement, which highlights the issue of proprietary products, access to them and the increasingly high cost of software.

Importance: Open software can be considered both an opportunity and an important resource. If open software is able to change the rules in the information technology industry, countries and companies that better understand it and are more advanced in its use will have a clear competitive advantage.

Objective: The objective of this concept is to make the core technology of a product available by releasing the source code, that is the programmes that the software is written in. This gives a large segment of professionals in industry, academia, research labs and government institutions access to this core technology. Each of the recipients can then further develop the product and contribute towards its overall development, by sharing what they know. One of the strong points of such an initiative is that the technology is not owned or controlled by any single company or country. The benefit for developing nations is that they can use open software for most of their needs at minimal cost, or no licensing costs.

Relevance to developing countries: The concept of Open Source has great promise for developing countries, but it also assumes certain efforts by the user nations. Most developing nations may find it difficult to take advantage of this technology option due to lack of skills. Developing nations could pool their resources to build a consortium of Open Source users, as is being done in the Asia-Pacific through the International Open Source Network (www.iosn.net). Open Source can enable developing countries to leapfrog into the Information Age. It encourages novel development models that have been demonstrated to be particularly well suited for taking advantage of the work of developers collaborating across the Internet. In general, it also has a positive impact on the creation of new markets and business opportunities.

Case Study—China: Government Embraces Open Source

Objective

To create both a hardware and software industry that 'will not fall into the foreign intellectual property rights trap' (www.opensource.org), thereby avoiding reliance on dominant US companies, particularly Microsoft.

Description

China is promoting Linux and other Open Source solutions in its government and to its citizens. Instead of becoming dependent on foreign hardware and software vendors, China is trying to develop its local technology industry. The government favours Chinese-developed Open Source software, like the Chinese Academy of Science's Red Flag Linux. Like other countries, China wants to build its computing infrastructure and economy with domestic spending and expertise.

7.2 Definition of Open Standards

A related issue is the adoption of Open Standards, which make it possible for open and proprietary software conforming to these standards to inter-operate and exchange data. This is essential for seamless inter-government and G2C communication. The Internet owes its explosive growth and impact to its foundation on Open Standards and Open software.

Importance: Without standards, technology cannot become ubiquitous. The most important feature of standards is that they allow for interconnection and the inter-operability of networks and equipment. An advantage of the use of Open Standards is that it provides more choices. The competition thus generated keeps the prices of the products down. In the absence of competition, technology costs are too prohibitive for developing nations.

Role of government: As a major user and as the policy formulator, government can play a decisive role in the adoption, practice and implementation of Open Source and Open Standards.

International Open Source Network (www.iosn.net)

The International Open Source Network (IOSN) is a Centre of Excellence for FOSS in the Asia-Pacific region. It aims specifically to create a network of policy makers, FOSS users and advocates in the region, so that resources and capacities will be better known and available to all. IOSN has the following objectives:

- Serve as a clearinghouse for information on FOSS in the Asia-Pacific region.
- Strengthen current FOSS capacities.
- Assist in the development of needed toolkits and resource materials, including 'localization' efforts.
- Assist in the coordination of FOSS programmes and initiatives through information sharing and networking in the Asia-Pacific region.

Much of the IOSN coordination work is undertaken online via the IOSN Portal where governments, individuals, advocates and others have access to information, tools, resources and on-line discussions. IOSN's vision is for developing countries in the Asia-Pacific region to achieve rapid and sustained economic and social development by using affordable yet effective FOSS ICT solutions to bridge the digital divide.

Benefits: The major benefits of Open Software and Open Standards can be summarized thus:

- Reduced costs and less dependence on imported technology and skills.
- Affordable software for individuals, enterprise and government.
- Universal access through mass software rollout without expensive licensing implications.
- Access to government data without the barrier of proprietary software and data formats.
- Ability to customize software to local languages and cultures.
- Lowered barriers to entry for software businesses/development of local software industry.
- Participation in the global network of software development.

Chapter Eight

The Role of Stakeholders

The challenge for governments in the Information Age is to re-examine their roles, laws, regulations and national policies to ensure that their country is able to exploit the opportunities and benefits that are emerging from the convergence of ICTs in the knowledge economy. To be able to do this, certain questions need to be addressed. A key question is who are the stakeholders and to what extent, in which areas and at what points of time in the development process should governments interact or engage with them.

STAKEHOLDER	ROLE
Government ministries and parliamentarians	Formulate laws and policies and provide an enabling environment.
National and international private sector	Key suppliers of investment, finance and technical services.
Telecommunication sector	Provide the necessary infrastructure.
Independent regulatory bodies	Implement policy directives and manage the regulatory system.
NGOs	Increase their role as providers of services in communities.
Researchers and scientists	Provide R&D; innovation.
ICT personnel	Implementers, network engineers.
Professional bodies	Providers of input on the technological, scientific requirements.
International and regional institutions	Supporting the policy-making process.
Academic institutions and educationists	Human resource development.
The media	Awareness raising; watchdog role.
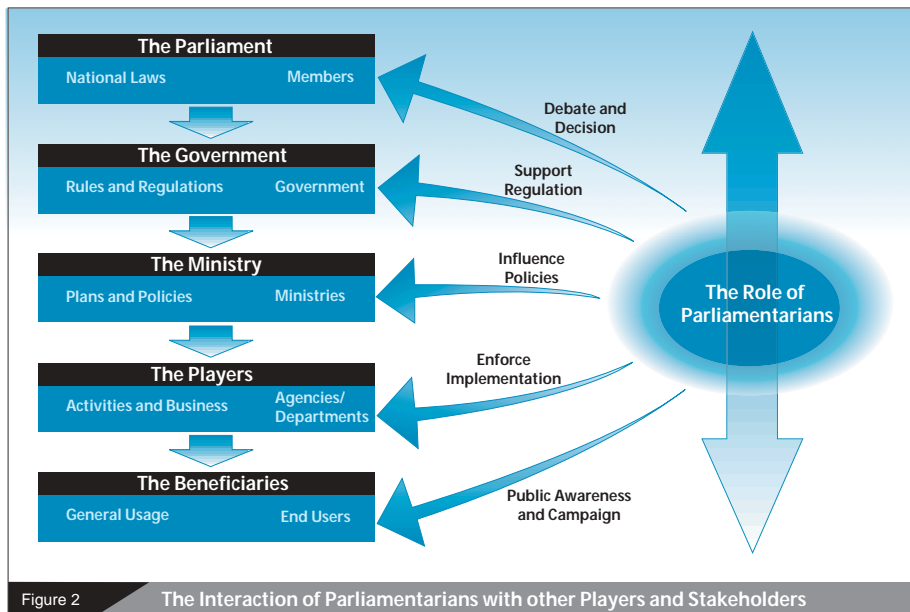
| Figure 2 | The Interaction of Parliamentarians with other Players and Stakeholders |

- The role of parliamentarians in the promotion and use of ICT4D touches all levels of society. While they can start by acquiring basic knowledge on ICTs and propagating it among their constituencies, parliamentarians play an especially important role in debating national ICT laws, regulations and policies.
- The general usage of ICTs in villages and communities can be enhanced if local politicians take a lead. To some extent, parliamentarians also have a responsibility to encourage ICT use by communities, business entities and the nation as a whole.
- With regard to ICT plans and policies that are developed by individual ministries, it is the mandate of parliamentarians to seek clarification and influence the implementation process.
- With adequate knowledge and appreciation of ICTs, rules and regulations developed by the government can be suitably debated and modified.

Case Study—India: Public-private Partnerships—eSeva Project
www.esevaonline.com

Objective
To enable the Andhra Pradesh government to meet its objective of 'transparency, accountability and speediness' through the convergence of on-line services offered to its citizens.

Description
The e-seva project was developed by the state government of Andhra Pradesh. It consists of 28 statewide community one-stop shops, where citizens can transact with the government in different ways.

Citizens can instantly pay their utility bills or property tax on-line through e-seva centres, instead of waiting in long queues. Services like tourism; issuance of birth and death certificates; permits/licenses/registration of vehicles and property valuation statements; and collection of small savings are available from e-seva centres.

The government has also introduced facilities for payment of cell phone bills, Automated Teller Machines, financial services like mutual funds and securities, as well as some central government services related to the receipt of passport applications. Payments are received in the form of cash, cheque, demand draft or credit card.

The centres also offer such e-services as downloading of application forms, completing application forms for birth certificates on-line, and payment of bills online if the customer has an account in the banks with on-line banking facilities.

These centres are a partnership between the government and private firms, which provide the hardware and software in return for transaction fees. The partnership makes the centres a sustainable business model and the Andhra Pradesh government is able to meet its objective of 'transparency, accountability and speediness'.

ICT4D Agencies

9.1 Overview

There are numerous agencies that are involved in ICT4D initiatives and the provision of assistance (that is, financial, technical and consultancy services), in aid of the social and economic progress of developing nations. These include national development agencies, multilateral agencies, regional organizations, foundations, non-profit organizations and the private sector.

9.2 Approach and Scope

The approach taken encompasses almost all fields, including capacity-building (education); empowerment (women, indigenous and marginalized communities); access and connectivity (infrastructure and alternative connectivity measures); awareness building (publications and hosting conferences); commercial opportunities (e-commerce) and others. The recipient nations are spread geographically in all continents. Most ICT4D agencies have a section on their website to elaborate on projects they have undertaken. Unfortunately, there are very few agencies that have placed critical reports or analysis of the ICT4D projects undertaken on their websites.

Interestingly, an increasing number of ICT4D agencies are engaging in sectoral or national-level dialogue with central agencies (for example, rural development, telecommunication, urban planning or finance ministry), and providing funding for a set of agreed-upon governmental activities. This creates a situation whereby the donors are not directly interfacing with the individual implementing agencies. These agencies, therefore, have limited abilities to influence and monitor the ICT-enabling agenda at the implementation level.

9.3 Funding and Sustainability of Initiatives

It is undeniable that when the funding of an initiative is solely from an external source, i.e., a donor agency, the sustainability of the initiative is closely associated with the migration path and transition from dependent project to semi- independence as determined by the donor agency. There are numerous accounts of ICT4D projects that fail when funding from the donor agency ends, suggesting that the main owner of the initiative was actually the donor. For this reason, it is most critical and highly recommended that in the conceptualization of the initiative, ICT4D agencies position themselves not as recipient of aid, but

as partners with a stake in the success of the project. Dependence on donors is a major problem in the development process. There has to be a will at the national grass-root levels to achieve development. Strategies for ensuring self-sustainability and empowerment of communities are vital.

9.4 Immersion Phasing and Project Ownership

The role of the ICT4D agency should at most revolve around the initial funding and provision of technical and administrative expertise in the areas where it is limited or is lacking. It is imperative that a clear phasing-out of donor inputs and a phasing-in of local inputs be scheduled. Local partners should be consulted at the outset of the planning process and be encouraged to provide other inputs such as acceptance of the responsibility of project leadership and ownership, and eventual project management. This joint responsibility is needed in all phases of the project cycle.

It is argued by certain donor agencies, that the life-cycle of hardware investments coincides with the life-cycle of the donor project, as that when the donor agency departs, the recipient agency is left with equipment that it must upgrade itself. The solutions they propose include better initial project design, recycling and upgrading of equipment (rather than replacement), capacity-building (in maintenance of equipment), planning for maintenance and replacement and including these in the budget at the initial phase of a programme.

9.5 Selection of Geographical Locations and Areas of Assistance

Policy makers and ICT4D agencies should be advised to undertake a more rigorous analysis of the social and cultural dimensions of ICTs to be able to design appropriate policies and initiatives to harness ICTs for development in their own context rather than relying on a one-size-fits-all approach in policy reforms and development initiatives. There is also a critical need for ICT4D agencies to engage in mutual dialogue about initiatives undertaken worldwide. The lack of dialogue has given rise to multiple projects towards the same end and has marginalized certain pockets of the population.

Conclusion

The preceding chapters have clearly demonstrated that all levels of society, governments, private sector and social institutions have begun to significantly use the vast opportunities provided by Information and Communications Technology for poverty reduction and sustainable human development. The relevant applications of ICTs have enabled nations, societies, and individuals to bridge social and economic gaps in ways that were never possible before.

A measurement of the applicability of ICT towards achieving the Millennium Development Goals has been undertaken by several international donor agencies. Although at a preliminary stage and controversial in nature, the study has led to a strong belief that there is indeed a positive relationship between human development and ICTs. It is put forth that ICTs can provide developing nations with an unprecedented opportunity to meet vital development goals and empower them to 'leapfrog' several stages of their development.

Most studies have conclusively indicated how the successful harnessing of ICT can lead to expanded economic growth, dramatically improved human welfare and stronger forms of democratic governance. ICT can thus directly play a vital role in furthering and enhancing sustainable development.

By the same token, however, this new-found panacea for societies has also created a new chasm, a digital divide by most counts, perpetuating and widening the gap between the 'have' and 'have-nots'. It must be noted that there is growing rural-urban disparities in terms of policy support; access, affordability and the lack of relevance of practical content within and among the Asia-Pacific countries. The rural-urban digital divide is widening because of geographic locations, rural areas are handicapped on account of lower literacy and lack of knowledge and awareness while urban populations seem to be benefiting more from new infrastructure, applications, and services.

Parliamentarians have a critical role to play to ensure the relevant implementation of ICTs for their constituencies and hence the importance of formulating the appropriate ICT policies and e-strategies. The worldwide knowledge revolution makes such strategies imperative and critical. However, unlike the previous industrial revolution, the knowledge revolution encompasses all aspects of society, and as such e-strategies require monitored implementation. It also requires governments to look

beyond achieving the goals of providing universal access and appropriate infrastructure. Policies on ICT should take into account other policy areas where ICT plays an important and complementary role, such as in trade and investment, education, infrastructure and legal and security environment. A coherent and comprehensive host of e-strategies should be developed that are in the final analysis, conducive, achievable, and above all, practical. A comprehensive e-strategy must therefore consist of a holistic framework that identifies actions, priorities, and implementation. It should also take note of the resources and capacities of its citizenry on a cross-sectoral basis. There are no templates for successful ICT policies and e-strategies and policy makers must analyse examples of success either within their own borders, or in other, similar countries, and adapt them as necessary to fit their unique circumstances.

In determining the appropriate strategies to pursue, countries need to assess their degree of e-readiness—to see where they stand along the route to develop ICTs. Only by possessing a clear understanding of their national strengths and weaknesses, can leaders position their respective countries to fully leverage on the emerging opportunities and face competition from the global interconnected marketplace.

It must be noted that this emphasis on applications of ICT for human development does not imply that it is undertaken to the detriment of the provision of basic services and utilities by the government. It must be taken and seen as an addition to these basic services; as governments need to determine how best these tools can assist in the creation of jobs, promoting economic growth, and increasing the reach and efficiency of health and education services to their citizenry. ICT remains a tool and a medium that enables, complements and facilitates the process of better public services to the masses via appropriate citizen-centric solutions.

In the final analysis, the application of ICT for development provides an unequalled opportunity for parliamentarians to strategically advance human development by alleviating poverty, enhancing education and improving healthcare. These roles are best undertaken in a coherent and consistent manner with consultative approaches encompassing the stakeholders from the community and society-at-large. Human development in essence reflects the expectations placed on parliamentarians by their respective citizenry and this should never cease to be the primary purpose of how ICT is perceived and applied.

Annexures

SELECTED ICT4D CHARTERS, DECLARATIONS, AND POLICIES

Numerous declarations and action plans have emanated at the regional level within the Asia-Pacific region that outline the promise, rationale, role, applicability, and parameters for the application of ICTs. Herewith, is a collection of several key documents highlighting the high-level commitment and support policy-makers within the region have placed on the appropriate application of ICT for human development.

ANNEXURE 1: MDGs agreed by the Meeting of Heads of State and Government from around the World at the Millennium Summit in September 2000

1.1 Millenium Development Goals (MDGs)

The MDGs constitute an ambitious agenda for reducing poverty and improving lives that world leaders agreed on at the Millennium Summit in September 2000. For each goal, one or more targets have been set, most for 2015, using 1990 as a benchmark:

Goal 1. Eradicate extreme poverty and hunger
Target for 2015: halve the proportion of people living on less than US$1 a day and those who suffer from hunger.

More than a billion people still live on less than US$1 a day: sub-Saharan Africa, Latin America and the Caribbean, and parts of Europe and Central Asia are falling short of the poverty target.

Goal 2. Achieve universal primary education
Target for 2015: ensure that all boys and girls complete primary school.

As many as 113 million children do not attend school, but the target is within reach. India, for example, should have 95 percent of its children in school by 2005.

Goal 3. Promote gender equality and empower women
Targets for 2005 and 2015: eliminate gender disparities in primary and secondary education, preferably by 2005, and at all levels by 2015.

Two-thirds of illiterates are women, and the rate of employment among women is two-thirds that of men. The proportion of seats in parliaments held by women is

increasing, reaching about one-third in Argentina, Mozambique and South Africa.

Goal 4. Reduce child mortality
Target for 2015: reduce by two-thirds the mortality rate among children under five.

Every year, nearly 11 million young children die before their fifth birthday, mainly from preventable illnesses, but that number is down from 15 million in 1980.

Goal 5. Improve maternal health
Target for 2015: reduce by three-quarters the ratio of women dying in childbirth.

In the developing world, the risk of dying in childbirth is one in 48, but virtually all countries now have safe motherhood programmes.

Goal 6. Combat HIV/AIDS, malaria and other diseases
Target for 2015: halt and begin to reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases.

Forty million people are living with HIV, including five million newly infected in 2001. Countries like Brazil, Senegal, Thailand and Uganda have shown that the spread of HIV can be stemmed.

Goal 7. Ensure environmental sustainability
Targets:
- Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.
- By 2015, reduce by half the proportion of people without access to safe drinking water.
- By 2020 achieve significant improvement in the lives of at least a 100 million slum-dwellers.

More than one billion people lack access to safe drinking water and more than two billion lack sanitation. During the 1990s, however, nearly one billion people gained access to safe water and the same number to sanitation.

Goal 8. Develop a global partnership for development
Targets:
- Develop further an open trading and financial system that includes a commitment to good governance, development and poverty reduction—nationally and internationally.
- Address the least developed countries' special needs, and the special needs of landlocked and small island developing states.
- Deal comprehensively with developing countries' debt problems.
- Develop decent and productive work for youth.
- In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.
- In cooperation with the private sector, make available the benefits of new technologies—especially information and communications technologies.

Many developing countries spend more on debt service than on social services. New aid commitments made in the first half of 2002 could mean an additional $12 billion per year by 2006.

ANNEXURE 2: Hyderabad Declaration 2004 adopted at the Second Asia IT Ministers' Summit held on 12-13 January 2004

We, the Ministers responsible for Information and Communications Technology (ICT) in the Asian Region, have met in Hyderabad, India, from 12-13 January 2004, for the Second Asia IT Ministers' Summit.

We have taken note of the framework agreed upon at Seoul, subsequent significant developments in ICT (in terms of technology, deployment and impact) both within Asia and globally, the rich range of the methods, strategies and policies being adopted in their deployment and the wealth of experiential knowledge being created in the process. Recognizing the urgent need to undertake definitive and firm steps to spread the benefits of ICT widely and equitably through increased cooperation at a regional level, we reiterate our resolve to work together on initiatives to promote and strengthen ICT in the region, having due consideration for the needs of the less developed countries. With this shared understanding, we adopt this Hyderabad Declaration.

We, the Ministers responsible for Information and Communications Technology, declare and agree that:

1. Bridging the Digital Divide

The rapid progress of ICT is continuously opening new opportunities to attain higher levels of development. At the same time, ICT has the potential of accentuating the various divides that exist in societies and economies in the absence of coherent strategies. Free access to economic opportunities is the driving force to bridge the digital divide. Adequate availability of ICT infrastructure, relevant content, affordable applications and the tools that can be used by people with their present levels of literacy will induce the masses to quickly adopt and absorb this technology. Some of these areas require technological intervention and support. Technological support is also required to make affordable communication and access devices and accelerate the deployment of ICT infrastructure. Governments need to identify the right applications in tune with their national priorities, leverage their existing non-IT infrastructure for proliferating ICT, ensure multi-sector partnerships, and help evolve sustainable business models that attract non-Government funds, trigger entrepreneurship and generate employment.

Keeping these dimensions in view and in order that all aspects of ICT deployment and services are addressed within the shortest possible time, we recommend the following actions:

a) *The availability of affordable information and communication infrastructure, as well as appropriate content and applications in regional languages, is vital for bridging the Digital Divide.*
We reiterate our commitment to encourage Research and Development, including innovative forms of networking, adaptation of ICT infrastructure, tools and applications that facilitate accessibility of ICT for all and the disadvantaged groups in particular.

b) *Appropriate competencies, including sensitivity to the potential of ICT and the issues relating to thir deployment, are a prerequisite for harnessing the benefits of these technologies.*

We will endeavour to develop tools and interfaces that help people to contribute to and benefit fully from the Information Society. The tools shall be ones that leap over the barriers of language and literacy and facilitate access, using speech and graphic interfaces.

c)   *The Governments are encouraged to undertake at least one large application, such as remote diagnosis and prescription, or eliminating illiteracy through IT, that can be used by a large section of the target population. This would motivate large sections of the Society to use ICT for their benefit. Other mass applications should also be identified. Each Government is encouraged to identify and deploy at least one such application over the next three years.*

d)   *The availability of affordable software and applications is an important component of an Information-enabled Society. The stakeholders should explore different software models, including the open-source model, to develop applications that best meet their requirements.*

e)   *Pilot deployment and field trials have been done in many areas to demonstrate the feasibility of using ICT to bridge the digital divide. The replicability of such applications on a large scale would depend on leveraging the existing infrastructure and on sustainable business models. We will study the feasibility and practicality of using the existing infrastructure of communications, post offices, schools, public libraries, entertainment and other such institutions to devise a scalable deployment of ICT services. In addition, sustainable models of Public/Private Partnerships would also be evolved. To maximize the benefit of such initiatives, the local, regional and national needs of education, health and social welfare would be among the areas on which we will focus our efforts.*

f)   *Wide distribution and sharing of best practices and knowledge, as well as Intellectual Property (IP) protection are important to encourage innovation and creativity. IP laws have to strike a balance between protecting IP creators and facilitating knowledge sharing.*

g)   *A regular mechanism to review the efforts and share experiences is essential to benefit from each other's experience. We should institute a mechanism for sharing experience regularly, and use ICT for this purpose.*

2. Standardization for ICT Development in Asia

We reiterate the importance of promoting standards of ICT for inter-operability and for optimization of cost and effort in the development of applications. Standardization efforts have to address areas relating to data, metadata and information interchange besides the business processes that underlie the services. We also recognize the need to put in place a system to audit applications so as to promote compliance with the standards.

Taking cognizance of these factors, we recommend the adoption of a concerted plan of action, which includes the following components:

1.   **PARTICIPATE** *in regional standardization activities in order to facilitate the development and deployment of interoperable IT products and services in Asia. Internationally accepted standards should be adopted as far as possible.*

2.   **UNDERTAKE** *regional level discussions on standardization of components and*

on areas of Information Technology, such as data, metadata, e-governance applications, interchange of data in all forms including text, images and multimedia; along the lines of similar work underway in the international fora.

3. **CONSIDER** according special emphasis to language handling capabilities in IT products in view of the wide spectrum of languages being used in the Asian countries. This should also include technology and interface matters for voice recognition, voice-to-text and text-to-voice applications in local Asian languages for giving a fillip to the spread and multiplication of IT applications among the masses. Regional collaboration in these areas should also influence the international standards for adoption by International Standards Organizations such as ITU, ISO/IEC.

4. **HARMONIZE** the legal and administrative framework for developing trust in e-commerce transactions across Asian countries, based on UNCITRAL Model Laws. Practical inter-operability difficulties in mutual recognition of digital signatures should be sorted out through experimentation and by promoting best practices. For this purpose, appropriate linkages should be established with the Asia PKI Forum.

5. **IDENTIFY** for possible adoption, international standards for security and promote the audit of information systems and networks by accredited Information Systems Auditors. For this purpose, an Asian Institute of IS Auditors could be established to play a proactive role in formulating the standards and for providing accreditation to IS Auditors based on a suitable competency evaluation.

6. **DESIGN** time-bound programmes for developing expertise in Asian countries in formulating standards for IT products and services and maturity models for information systems audit. If necessary, an institutional framework may be created for ensuring dissemination of knowledge.

7. **ATTEMPT** standardization at the process, application, metadata and data levels for deriving maximum benefit out of single submission of information by a citizen and for its reuse across the Government departments at the national level. Standards will have to be developed, keeping in view the special nature of e-governance applications for the masses that require more visual and voice based interface withthe e-governance systems.

3. Digitization of Culture

This Summit recognizes the role of culture — that is, the entire spectrum of its heritage, values, practices, ways of life, knowledge systems, languages and artistic expression transmitted through generations — in promoting self-respect in communities and among nations. We realize the great significance of Asia as a centre of cultural diversity. Taking into consideration the fact that traditional expressions of culture are getting obscured, diluted and transformed, this Summit proposes to develop an Asia Digital Culture Community for developing regional cooperation, coordinating international collaboration and catalyzing knowledge preservation in member countries. The preservation of our collective cultures will be enhanced through such activities as:

• *Raising awareness among international communities and groups about the*

value of digital documentation of their culture;

- *Adopting an agreed code of ethics for collection, digital documentation and publication of cultural resources;*
- *Developing local language technologies and on-line transmission capabilities;*
- *Fostering training in conservation, digitization and dissemination;*
- *Enabling IPR development for free access and dissemination of cultural resources.*

4. Construction of Broadband Network Environment in Asia

We note that broadband network infrastructure as well as IT services, products, applications and content have been deployed rather unevenly across the region.

Asian countries, which have modest penetration even in respect of narrow band Internet, can benefit from the experiences of the leaders. In this regard, infrastructure, access devices, development of content and applications, supportive government policy framework and the human resources required to support the knowledge economy will play an important role. Public-private partnership can help create the right ecosystem for proliferation of broadband network. Different technologies for Broadband Infrastructure, wire line and wireless, are growing in different countries and new ones are being added. These will have to be exploited as appropriate for the situations obtaining in these countries.

In order to achieve this, the following studies need to be undertaken:

1. *Since many countries in the Asian Region have still not partaken of the benefit and opportunity of ramping up to Broadband, they have a unique opportunity to leapfrog into Broadband Network Deployment to take advantage of the plummeting transport costs, huge pent up demand for Internet use and potential for new applications and services. For this, they already have shining examples within Asia to learn from. Exchange of Experiences and Best Practices in Broadband Network deployment would be undertaken to leverage this unique opportunity within the Asian Region that would benefit both IT-developed and IT-developing Asian countries. Towards this purpose, multilateral and bilateral funding must be mobilized to support exchange visits, training, workshops, conferences, etc.*

2. *A study would be taken up to analyse Government Policies which promote Broadband deployment in various countries with associated growth of application drivers, contents, products, services, supportive IT manpower, R&D and private/public sector investment. Experiences of Asian countries in this respect should be shared and disseminated through publications, exchange/ visits of representatives of industry and administrations.*

3. *Engineering test-beds need to be set-up to introduce and deploy next generation infrastructures such as IPv6, 3G/4G and specific applications of common interest to countries of Asian Region. Performance issues must also be addressed, eXchange Points set-up in Asian Region and intra-Asian traffic increasingly routed through these. Associated standardization efforts at the transport, applications and contents level have to be initiated. Participation in*

Asian fora, such as APNIC, APRICOT needs to be strengthened. A study on Engineering issues and Pilots in Broadband Network would be undertaken.

4. *The pace of deployment of applications like e-governance, e-commerce, tele-health, e-learning must be accelerated as also the creation of content and web enabled applications and transactions. Killer applications must be identified and pursued to sustain the enthusiasm for Broadband deployment. These constantly demand standards, associated statutory/advisory bodies, such as certifying authorities of digital signatures, Computer Emergency Response Teams and underlying technologies for local languages, e-security and open source. All these increase the need for new IT manpower skills of varying levels. Mutual help in these areas among Asian countries is imperative. Besides, Broadband brings in its wake a new class of applications in the areas of video, gaming and entertainment. To analyse these issues, a study on Broadband Application Drivers and Manpower Development would be undertaken.*

   The above studies may be undertaken by the 'working level study group' in terms of para 4A of Seoul declaration. The group is requested to finalize the reports in a time-bound manner.

5. Internet Affordability, Management and Security

We recognize the key role that a secure, well-managed and affordable Internet Infrastructure will play in taking the Asian community forward in the Information Age. It is necessary to evolve policies, technologies and cooperation mechanisms that are appropriate to local conditions. These initiatives shall address issues relating to technology options for access in the last mile, the cost, availability and quality of access and explore the alternative approaches to creating affordable access. The Internet Infrastructure will have the desired beneficial effect on the masses only if appropriate citizen-centric services are provided through it. We recognize that well-architected e-government initiatives can play a vital role in promoting the development of the region through the use of ICT. We recognize the need for creating an environment for promoting compliance to international standards on information security.

Taking cognizance of these factors, we recommend the adoption of a concerted plan of action which includes the following components:

1) **ENCOURAGE** *the setting up of Community Information Centres (CICs) on pilot basis in some countries in the region. The Government of India shall be willing to share its experience on the establishment of CICs models in the Northeastern states in India.*

2) **IDENTIFY** *feasible mechanisms for sharing bulk bandwidth among Asian countries to reduce the overall cost of setting up international gateways for each nation.*

3) **PROMOTE** *Internet exchange nodes to encourage data exchange at national and regional levels.*

4) **ATTEMPT** *to integrate voice, data and video services to build a single unified service for economic viability. Towards this end, new protocols like IPV6 can play an important role.*

5) *PROVIDE useful government information and services to citizens through Internet to promote the use of ICT for development.*

6) *STUDY the feasibility of establishing a regional Research & Development Centre for working on new Internet protocols, management strategies and security issues to help the region leapfrog in Internet infrastructure development through innovative technologies and make them available at an affordable cost.*

7) *SECURE the information infrastructure in view of the increased vulnerability of Internet-based systems and their impact on critical infrastructure, such as energy, telecommunication and transportation. In order to achieve this, one of the components is to raise the awareness among the Asian countries on the importance of establishment of National–Computer Emergency Response Team (N-CERT) as well as the cooperation among Asian N-CERTs.*

We note with satisfaction the broad acceptance, support and participation that this forum has secured. It provided a useful opportunity and mechanism to crystallize and articulate common regional concerns, while facilitating the identification of common strategies and approaches by learning from each other in a regional perspective. We expect this forum to expand further and intensify its activities and strengthen the mechanisms that ensure continuity. We appreciate and warmly endorse the offer of Bahrain to host the next Asia IT Ministers' Summit and assume the responsibility of steering the course of its evolution. We also note and accept with thanks the offer of Myanmar to host the Asia IT Ministers' Summit in 2006 and thus provide continuity to this collective and collaborative effort.

ANNEXURE 3: Kuala Lumpur Declaration on ICT Policies and e-Strategies in Asia and the Pacific adopted at the Asian Forum on Information and Communications Technology Policies and e-Strategies held on 20-22 October 2003

The Asia-Pacific is one of the world's most dynamic regions in terms of Information and Communication Technology (ICT) developments. Representing this vast, diverse and dynamic region, delegates, including Ministers and senior government officials as well as private sector and civil society representatives, from 22 countries in the Asia-Pacific Region and regional and international organizations convened at a Forum on Information and Communication Technologies held on 20-22 October 2003 in Kuala Lumpur. The participants of the Forum engaged in productive deliberations, which are reflected in this declaration:

Underlining the importance of Poverty Reduction and the Millennium Development Goals as a focus of development aspirations in the region;

Recognizing the extraordinary potential for human development embodied in the cluster of goods, services, and practices described as information and communication technologies;

Understanding the possibilities opened up by ICTs for creativity, decentralized decision-making, and innovation by persons, groups, and enterprises hitherto marginalized from full participation;

Accepting the responsibility of government to create the conditions for the optimal utilization of the new possibilities by citizens, groups, and enterprises through institutional reforms;

Emphasizing the importance of involving private sector and civil society, in particular, women, in the development and implementation of ICT policies and e-strategies;

Giving weight to the values of equality of opportunity, non-discrimination, cultural and linguistic distinctiveness, and sustainability;

Acknowledging the benefits of mutual learning, co-operation, and co-ordination among the members of the Asia-Pacific region in the areas of ICT policies, strategies, and practices;

Realizing the important role of regional and international organizations in facilitating the application of ICT to development; and

Taking note of previous deliberations and declarations, including the Communiqué of the Ministerial Roundtable on 'Toward Knowledge Societies' held on 9-10 October 2003 during the 32nd session of UNESCO's General Conference, the Association of South East Asian Nations — Joint Statement for the World Summit on Information Society (WSIS) 2003, the Tokyo Declaration adopted at the WSIS Asia-Pacific Regional Conference held on 13-15 January 2003, and the Pacific Islands Information and Communication Technologies Policy and Strategic Plan of 2002;

We the participants of the Asian Forum on Information and Communication Technology Policies and e-Strategies hereby endorse the formulation, adoption, and implementation of ICT policies and e-strategies at the national, bilateral, regional, and international levels that include the following elements:

Poverty Reduction and the MDGs
1. Ensure that ICTs are harnessed in the pursuit of poverty reduction and the achievement of MDGs, thus helping to overcome the digital divide;
2. Deploy ICTs actively in the policies and strategies for empowering women.

Policy and Governance
3. Ensure transparency and accountability of governments and the participation of multiple stakeholders, including women and ethnic minorities, in the formulation and implementation of ICT policies and e-strategies, utilizing the technical features of ICTs;
4. Establish legal and technical principles to assure trust and confidence, and make possible trust-building actions by users, giving due regard to data protection, privacy and the security of persons, enterprises, and society against any harm;
5. Ensure that policies and strategies are periodically evaluated and modified as necessary to yield the desired results;
6. Encourage South-South learning through effective arrangements at an inter-agency level to initiate exchange of information, best practices, and explore possible collaborative development programmes.

Infrastructure and Access
7. create the conditions and incentives for the provision of widest possible access to ICTs, particularly for rural and under-served areas in configurations responsive to demand;
8. Enable the private sector and civil society to participate in the provision of affordable ICT infrastructure, products, and services in forms of their choosing.

Human Capacity
9. Facilitate opportunities for human resource development and life-long learning through and on ICTs, with particular attention to women;
10. Support youth programmes related to ICT skills development.

Content and Applications
11. reflect the appropriate balance between rewarding the originators of knowledge and creative content, and the fair and flexible use of information products;
12. develop creative approaches to preserving and advancing cultural and linguistic distinctiveness and self-expression in the new ICT environment;
13. Balance considerations of software alternatives between open source and proprietary platforms and applications.

Enterprise and Entrepreneurs
14. Allow the greatest flexibility for entrepreneurs and enterprises to use ICTs to create wealth, trade, and employment opportunities;
15. Ensure the provision of sustainable sources of revenues to priority programmes.

Strategic Compacts and Cooperation

16. Engage in bilateral, multilateral, regional, and international cooperation, to fully realize the potential of ICTs, to learn from each other, and adopt best practices;
17. Take into account the special needs of least developed countries, landlocked and developing island nations of the Asia-Pacific in the application of ICT to development.

Governments, regional organizations, and international organizations responsible for the formulation and adoption of ICT policies and e-strategies are urged to develop and adhere to adequately resourced action plans that designate responsible actors, timelines, and priorities as appropriate for their particular circumstances.

This declaration is timed so as to be able to make a contribution to the Geneva phase of WSIS 2003. As follow-up and in light of the outcomes of the Geneva phase of WSIS, we agree to convene the Asia-Pacific Forum on ICT Policies and e-strategies, which will involve stakeholders from the public, private sector, civil society, regional and international organizations, during the inter-Summit period (2003–2005) to:

- review national and regional action plans vis-à-vis the WSIS 2003 Plan of Action;
- discuss common challenges in implementation;
- exchange information on lessons learned and best practices, and
- establish solutions-oriented e-strategies.

Preamble

Representatives of the governments of 47 countries, 22 international organizations, 54 private sector entities and 116 NGOs of the Asia-Pacific region gathered at the Asia-Pacific Regional Conference, held in Tokyo from 13-15 January 2003, to develop a shared vision and common strategies for the 'Information Society'. The objective of the conference was to discuss how best to work together to contribute to the region's effective transition to an information society that will accelerate and enhance regional economic, social, cultural and technological development.

The conference emphasized that a primary aim of the information society must be to facilitate full utilization of ICTs at all levels in society and hence enable the sharing of social and economic benefits by all, by means of ubiquitous access to information networks, while preserving diversity and cultural heritage.

The Conference endorsed the important role that ICTs can play in achieving the United Nations MDGs, which describe a fundamental set of principles and guidelines for combating poverty, hunger, disease, illiteracy, environmental degradation and gender inequality.

1. Shared Vision of the Information Society

The concept of an information society is one in which highly-developed ICT networks, equitable and ubiquitous access to information, appropriate content in accessible formats and effective communication can help people to achieve their potential, promote sustainable economic and social development, improve the quality of life for all, alleviate poverty and hunger, and facilitate participatory decision-making processes. The information society in the Asia-Pacific region must:

1. Provide equitable and appropriate access for all to well-developed, affordable and easily-accessed information and communication network infrastructures.
2. Use ICTs as a driving force for the promotion of sustainable economic and technological development by enlarging the gross national product (GNP) through increased technological innovation and continuous research and development resulting in reduced levels of poverty through robust economic growth.
3. Enhance the sharing and strengthening of global knowledge for development by ensuring equitable access to information for educational, scientific, economic, social, political and cultural activities, leading to a vibrant public domain of information.
4. Preserve the rich and diverse cultural heritage and social values of the

Asia-Pacific region in the Information Age.

5. Provide information and communication services targeted at disadvantaged groups in society, in particular those from lower-income groups, to contribute to the alleviation of poverty.
6. Use ICTs to strengthen traditional media such as broadcasting and print, which will continue to have an important role in disseminating content in the information society.
7. Promote the use of ICTs for capacity-building and human resource development, including ICT literacy, with special reference to the requirements of people with disabilities.
8. Ensure the security and reliability of information and communication networks so as to build confidence and trust in the information society.
9. By providing a secure environment for communication, ensure that the use of information and communication services does not place vulnerable groups at risk.
10. Facilitate the important role played by the private sector and civil society in the development of diversified ICTs, networks and services in the information society. Concurrently, acknowledge the significant role of governments in terms of creating stakeholder partnerships that engender trust and confidence, promote fair competition, encourage innovative private sector investment and new initiatives, and promote global and regional cooperation, while protecting consumers and safeguarding public interests.
11. Promote strategies to assess and deal with the environmental impact of ICTs.
12. Continue the ongoing spirit of cooperation and solidarity among the countries of the region.

2. Recognizing the Unique Features of the Information Society in the Asia-Pacific Region

In building an information society for the Asia-Pacific region, we should take into account its unique features:

1. *Geographic and demographic diversity*: The region comprises the earth's largest land mass and vast ocean as well as many small islands. The region has over 65 percent of the world's population, including over 75 percent of the world's poor. Many countries of the region have very low population densities spread over large percentages of their areas. Many rural populations are also inaccessible, and have limited contact with other communities.
2. *Cultural and linguistic diversity*: This region enjoys a richness of ancient and modern cultures, including diverse languages, social traditions and customs. Of the more than 6,800 languages in the world, 3,500 (51 percent) are spoken in the Asia-Pacific region, including languages without written scripts.
3. *Institutional stability*: Generally speaking, the region is institutionally stable. Such stability will enable the region to attract more investors, including innovators, entrepreneurs, operators, manufacturers and vendors in the field of ICTs.

4. *Productive workforce*: The region's economic growth depends on a large, productive workforce, capable of fully utilizing ICTs. Given the strong integration of the region into the global economy, this will maintain and enhance the competitive position of its enterprises, leading to the growth of decent employment.

5. *Gender issues*: Unequal power relations and other social and cultural aspects have contributed to differential access, participation and status for men and women in the region. In this regard, more attention should be given to overcoming these constraints and ensuring that women can equally benefit from the increased use of ICTs for empowerment and full participation in shaping political, economic and social development.

6. *Disability issues*: There are an estimated 400 million persons with disabilities in the Asia-Pacific region. The majority is poor and has been excluded from the benefits of ICT development due to the lack of appropriate or affordable technology for persons with disabilities. More effort, including implementation of disability-concerned regional plans of action and programmes, should be made to ensure equitable access to ICTs for persons with disabilities.

7. *Youth issues*: Youth forms the majority of the population in the Asia-Pacific region and is a force for socio-economic development. Equipping young people with knowledge and skills on ICTs to prepare them for full participation in the information society is an important goal.

8. *Digital divide disparities*: In the region as a whole, there is a noticeable disparity in access to, and use of, the latest ICTs, including Internet access and broadband availability, between and within countries. It is recognized that the barriers to equitable access result from differences in education and literacy levels, gender, age, income and connectivity. In this context, particular attention should be given to least developed countries, economies in transition and post-conflict countries.

9. *Imbalance of information flows*: While there is substantial internal international trade within the Asia-Pacific, North American and European regions, the same cannot be said for the flow of information between these regions. There is potential for growth in information flows between the Asia-Pacific region and the rest of the world, as well as between countries within the region.

10. *Pioneering role in selected ICT areas*: Within the region, some countries have been pioneering, *inter alia*, broadband, satellite and mobile telecommunication services, among others, which are having a significant impact on the way people communicate and on the delivery of government and business services. The experience gained by those countries in this field can be shared with others to promote good practice at local, national, regional and global levels.

11. *Special circumstances of regional small island developing States*: These countries, vulnerable to environmental hazards, and characterized by small, homogenous markets, high costs of access and equipment, human resource constraints exacerbated by the problem of 'brain-drain', limited

access to networks and remote locations, will require particular attention and tailored solutions to meet their needs.

3. Advancing the Region's Information Society

In order to promote the development and advancement of the information society, it is necessary to address many issues, within and across sectors, while ensuring that the essential platform of ICT infrastructure and services, standards and innovation are established.

1. Priority Areas for Action

a) Infrastructure development

The development of the information society must be based on platforms of internationally inter-operable technical standards, accessible for all, and technological innovation of ICTs, as well as systems to promote the exchange of knowledge at global, regional and sub-regional levels through any media. In this regard, in addition to enhancing people's awareness of the advantages of using ICTs, reliable, advanced and appropriate ICTs and service infrastructures are required.

As a sharp increase in the volume of international and regional Internet traffic is anticipated, it is important to strengthen regional and international broadband network infrastructure by using new technologies to enhance network efficiency and provide the capacity to match the needs of the countries in the region.

Working towards open and flexible international and inter-operable standards is an important issue for all countries so as to ensure that all can utilize the technology and associated content and services to their maximum potential. Development and deployment of Open Source software should be encouraged, as appropriate, as should Open Standards for ICT networking.

b) Securing affordable, universal access to ICTs

In order to achieve affordable and universal access, it is important to enable existing and new technologies to provide connectivity to all, in particular through institutions accessible to the public such as schools, libraries, post offices and multi-purpose community centres. Special attention should be paid to how ICTs can benefit the disadvantaged through innovative initiatives.

High-quality access, attainable through broadband, has great potential to help better deliver essential services required to meet basic human needs through applications such as e-education and e-health, as well as e-business and other ICT applications. Also, new technologies, such as wireless and satellite networks can assist remote areas, including small island nations, to gain access to information and knowledge.

c) Preserving linguistic and cultural diversity and promoting local content

Linguistic and cultural diversity enriches the development of society by giving

expression to a range of different values and ideas. It can facilitate the spread and use of information by presenting it in the language and cultural context most familiar to the user, thereby further encouraging the use of ICTs.

Promoting broadband networks in the Asia-Pacific region can not only support research, business and personal activities, but also help to preserve cultural diversity and indigenous knowledge and traditions. In this context, an effort should be made to support multilingual domain names, local content development, digital archives, diverse forms of digital media, content translation and adaptation. The development of standard and recognized character sets and language codes should also be supported.

d) Developing human resources

In order for people to make the most of the information society, they must have enhanced levels of ICT literacy and ICT skills. To achieve this, relevant education and training should be promoted at every level, from primary to adult, to open up opportunities for as many people as possible, especially for the disadvantaged. The capacity of developing and least developed countries to apply ICTs effectively, must be enhanced through regional and international cooperation.

ICTs can contribute to enhancing the quality of teaching and learning, and the sharing of knowledge and information. Teachers act as a gateway to the information society and their skills development and curriculum resources need increased support.

It is also important to improve both basic and advanced education in science and technology. This will help to create a critical mass of highly qualified and skilled ICT professionals and experts that will continue to serve as a foundation for the region's ICT development. It is recognized that education in network infrastructure development and operation is of particular importance and is critical to the availability of efficient, reliable, competitive and secure ICT network services.

e) Establishing legal, regulatory and policy frameworks

The transition to the information society requires the creation of appropriate and transparent legal, regulatory and policy frameworks at the global, regional and national levels. These frameworks should give due regard to the rights and obligations of all stakeholders in such areas as freedom of expression, privacy, security, management of Internet addresses and domain names, and consumer protection, while also maintaining economic incentives and ensuring trust and confidence for business activities. In order to secure prompt settlement of disputes, alternative dispute resolution (ADR) should be considered along with normal judicial proceedings.

f) Ensuring balance between intellectual property rights (IPR) and public interest

While intellectual property rights play a vital role in fostering innovation in software, e-commerce and associated trade and investment, there is a need to promote initiatives to ensure fair balance between IPRs and the interests of the users of information, while also taking into consideration the global consensus achieved on IPR issues in multilateral organizations.

Copyright holders and distributors of content should be cognizant of the need to ensure that content is accessible for all, including persons with disabilities. In this connection, access requirements should be included in legal, regulatory and policy frameworks, where appropriate.

g) Ensuring the security of ICTs

Among the challenges to the region are the general lack of awareness of information security issues, the rapidly evolving complexity, capacity and reach of IT, the anonymity offered by these technologies, and the transnational nature of communication frameworks. Recognizing the principle of fair, equitable and appropriate access to ICTs for all countries, special attention should be paid to the fact that ICTs can potentially be used for purposes that are inconsistent with the objectives of maintaining international stability and security, and may adversely affect the integrity of the infrastructure within states, to the detriment of their security in both civil and military fields. A multi-pronged approach is needed to address these challenges and cybercrime, on all fronts, with emphasis on preventive approaches, national guidelines and regional and international cooperation. At the same time, action to address cyber-crime and to ensure a safe and secure information society must respect the sovereignty of nations and maintain respect for the constitutional and other rights of all persons, including freedom of expression.

All stakeholders concerned with ICT issues should take the necessary steps to enhance security, user confidence and other aspects of information and system/network integrity, in order to avoid the risk of wholesale disruption and destruction of the network systems on which they are increasingly dependent.

Effective information security may be guaranteed not only by technology, but also by education and training, policy and law, and international cooperation. In the long term, development of a 'global culture of cybersecurity', based on a common understanding of regulations and appropriate mechanisms for information and technology exchange and international cooperation, should be promoted.

h) Fostering partnerships and mobilizing resources

The private sector plays an important role in the development and diffusion of ICTs, while civil society, including NGOs, works closely with communities in strengthening ICT-related initiatives. Increased cooperation and partnerships are needed between governmental and inter-governmental organizations, the private sector and civil society, for effective design and implementation of various initiatives, by giving priority to locally-available human resources. All stakeholders are urged to mobilize resources for the development of the information society, including through increasing investment in telecommunication infrastructure, human capacity-building, policy frameworks and the development of culturally sensitive local content and applications. International and regional organizations, including financial and development institutions, have an important role to play in integrating the use of ICTs in the development process and making available the necessary resources for this purpose.

2. Cross-sectoral Priority Programmes and Activities

To make significant progress, all countries of the region will need to mainstream ICTs, with special reference to gender, within their national and regional development strategies, and across all sectors.

In this context, the following initiatives can support social and economic development, including the emergence of e-communities, while at the same time ensuring that traditional models are recognized and respected, so that the non-users of ICTs are not marginalized.

a) e-Government

ICT networks can offer better public services to citizens by more efficient and effective dissemination of information and delivery of essential government services. e-Government can also generate a greater sense of community participation, and improve informed decision-making and development programme implementation.

b) e-Business

Through the application of ICTs, businesses in all sectors can achieve increased productivity and profitability, reach wider markets, lower their transaction costs and control inventories more effectively. On the consumer side, ICTs can bring to consumers greater satisfaction through their interaction with many potential suppliers, beyond the constraints of location.

c) e-Learning

Access to education and knowledge is essential for economic, social and cultural development, and as a means of personal empowerment, community development and business efficiency. ICT networks have the potential to offer unprecedented educational opportunities to all groups, in all areas of the Asia-Pacific region. Implementation of affordable and universal educational programmes, content, broadband networks and hardware should be promoted.

d) e-Health

Access to health care information and services is a basic right. Many countries lack adequate health care facilities and personnel, particularly in rural and remote areas. The use of ICTs promotes social inclusion of all members of society by enabling equitable access to health care services as well as empowering citizens to better manage their own health and to participate more effectively in the health care process.

e) Community information and communication centres

Community information and communication centres are critical to ensure inclusive access to information and social services, particularly in rural areas.

3. National and Regional e-Strategies

Comprehensive ICT strategies that have been endorsed at the highest political levels and that include clear goals need to be formulated at community, national, regional and global levels in order to create the information society. These

strategies will be encouraged to be designed and implemented through the collaboration and participation of all stakeholders. In this regard, awareness of the vast potential of the positive use of ICTs should be promoted among all concerned.

4. Conclusion

This Declaration was adopted at the conclusion of the Asia-Pacific Regional Conference and will be submitted as the Asia-Pacific region's input to the WSIS process. Furthermore, the Conference recognizes the importance of the declaration and plan of action resulting from the WSIS process, taking into account internationally agreed goals, including those of the Millennium Declaration.

ANNEXURE 5: Pacific Islands ICTs Policy and Strategic Plan adopted by the Ministers of the Pacific Islands in April 2002

Vision

Information and Communication Technologies for every Pacific Islander.

Introduction

This draft policy and strategic action plan sets out a framework of guiding principles and policies and recommended activities to guide future policy development and co-operation by the Pacific Island Countries and Territories (PICTs).

The development of PICTs has long been hampered by dispersed populations, small sizes and vast ocean distances. These circumstances impose large costs on service provision in education, economic development, social welfare, health, travel and communication and have limited the growth of important industries such as fisheries, agriculture and tourism.

Improvements in telecommunications services and information technology now provide increasing opportunities for PICTs to overcome these circumstances by:

- reducing barriers of distance;
- improving service delivery across countries and the Pacific Community;
- reducing costs;
- improving the knowledge, skills and general development of their people;
- maximizing the economic growth of their countries and the Pacific Community; and
- working more effectively together.

Leadership from governments and partnerships with businesses, non-government organizations (NGOs), religious groups and the community at large are required to facilitate participation in the knowledge society and to make their countries part of the global knowledge economy. All need to work closely to develop a connected population and to use information and communications technology to maximise the potential of the region and its people. Governments will also need to provide special attention to protect the social, cultural and ethnic diversity of the Pacific Community. By committing to individual and collective action partners will increase the use of ICT to benefit the people of the Pacific Community.

Co-operation amongst the PICTs is essential to fully realise the benefits of ICT noted above. Co-operation provides a voice on the common needs and issues of the Pacific Community, and strengthens national efforts.

This document is organized as follows:

- The regional policy has four guiding principles on human resources; infrastructure development; cooperation between stakeholders; and appropriate policy and regulation. These are the region's goals.

- Policies are stated for each guiding principle, intended to set the rules by which specific strategies and actions will be designed to achieve the goals. They are long-term, but may be reviewed and changed every 3–5 years if necessary.
- The regional strategic plan consists of strategies for each policy, intended as the general means by which the goals will be reached. They are medium-term, but may be reviewed and changed on a 1–3 year cycle as required.
- Activities under each strategy in the plan are the specific means by which strategies are implemented. They should be monitored continually and modified annually if needed. Each activity has an identified actor(s) and a proposed time line or milestone.

This policy and strategic action plan is a draft document that will be circulated for review and comment by governments, regional organisations, the private sector, and development partners. It was initially developed by the Pacific Information and Communication Technologies (ICT) Needs Assessment and Strategy Planning Workshop, held between 27–31 August 2001 in Noumea, New Caledonia. The workshop was sponsored by the Governments of Australia, France and New Zealand; jointly organised by SOPAC, Pacific Islands Forum Secretariat and Secretariat of the Pacific Community; and attended by about 100 representatives of PICTs and regional organisations.

The draft policy and strategic action plan has been further elaborated and finalized by the Council of Regional Organizations of the Pacific ICT Working Group, comprising the Forum Fisheries Agency, Pacific Islands Development Programme, Pacific Islands Forum Secretariat, South Pacific Applied Geoscience Commission, Secretariat of the Pacific Community, South Pacific Regional Environmental Programme, South Pacific Tourism Organization, and University of the South Pacific, along with international development partners.

This policy and strategic action plan is intended to provide guidance at two levels. On matters where regional co-operation is required, it should be taken as a mandate to regional organizations. On matters where national action is required, it should be interpreted as guidance for national consideration. This policy and strategic action plan was developed by and on behalf of the following Pacific island countries and territories:

- American Samoa
- Cook Islands
- Federated States of Micronesia
- Fiji
- French Polynesia
- Guam
- Kiribati
- Marshall Islands
- Nauru
- New Caledonia
- Niue

- Northern Marianas
- Palau
- Papua New Guinea
- Pitcairn Islands
- Samoa
- Solomon Islands
- Tokelau
- Tonga
- Tuvalu
- Vanuatu
- Wallis and Futuna.

The workshop endorsed this draft policy and strategic action plan for consideration by national governments, regional organizations and development partners. PICT representatives also asked the Council of Regional Organizations in the Pacific (CROP) ICT Working Group to:

- co-ordinate further regional action to have this policy recognised by stakeholders in the development of their national ICT policies.
- further develop the ICT strategic plan, taking into consideration the information papers presented in the workshop and keeping all workshop participants informed.
- identify a suitable review process for the policy and strategic plan, such as in conjunction with the annual meeting of the working group.

The workshop agreed that the profile of 'ICT for every Pacific Islander' warranted highlighting and recommended to national governments, regional organizations and development partners that this could be achieved by: (i) a Pacific decade of ICT; (ii) a Pacific year of ICT; (iii) establishing an annual Pacific ICT forum.

Part 1: Pacific Islands ICT Policy

Guiding Principle 1: Human Resources

ICT will be used to inform and connect Pacific Island populations and ensure that they benefit from flexible and appropriate education and training.

Pacific Island Countries and Territories (PICTs) are characterized by their remoteness, dispersed populations, and limited human resources and institutional capacity. As a result, opportunities for participation in sectoral applications are limited. Improvements in access, awareness, human resources development, and usage are required for populations of PICTs to take their full place in the global knowledge society.

Policy 1.1: Awareness of ICT and computer literacy at all community levels will be promoted and developed while safeguarding existing social and cultural values.

Policy 1.2: PICTs will develop and retain a knowledgeable ICT workforce that will be able to contribute to the maintenance and further development of ICT.

Policy 1.3: ICT strategies will be developed and/or strengthened in a flexible manner to facilitate human resource development, capacity building, and reduce professional isolation of Pacific Islanders at all educational levels and especially in rural and remote communities.

Policy 1.4: Everyone will have equal opportunity access to ICT without barriers with special regard to women, the disadvantaged, the disabled, under represented minorities, and those in rural and remote communities.

Policy 1.5: Recognizing the value of information, Pacific people will have the opportunity to contribute to the global community through the promotion of the rich Pacific cultural identity and diversity.

Guiding Principle 2: Infrastructure Development

Appropriate ICT infrastructure will be developed to support development for Pacific Islands.

Access to basic telecommunications and the Internet is generally more expensive in the Pacific Island Countries and Territories (PICTs) than in other parts of the world. These higher costs have negative impacts on development of essential services such as education, health, and greater economic opportunities.

Policy 2.1: Regional and national ICT networks and support infrastructure will be reliable, secure, fast, cost-effective and adaptive.

Policy 2.2: PICTs will encourage private sector investment in ICT infrastructure and promote competitive markets for ICT service provision, where appropriate.

Policy 2.3: PICTs and regional organizations will co-operate to promote a regional approach to consideration and adoption of global ICT standards.

Policy 2.4: Regional and national institutions will work with service providers toward practical Universal Access to ICT.

Policy 2.5: PICTs and regional organizations will co-operate to improve access and lessen the financial burden that development of ICT imposes on governments, non-government organizations and businesses.

Guiding Principle 3: Cooperation between Stakeholders

Easy access to information through ICT will strengthen cooperation between stakeholders to ensure good governance, to develop the private sector and to improve service delivery.

Development of new methods in commerce, education, and public administration in PICTs is inhibited by limited human resources and institutional capacity and the high cost of information management systems. Co-operation between the three spheres of social, economic, and civil activity is essential to overcome these constraints.

Policy 3.1: Governments and regional organizations, the private sector and NGOs including religious groups will expand their use of ICT for interaction with their stakeholders, dissemination of information, and promotion of the principles of good governance and sound business planning.

Policy 3.2: Development of community access to local content will be encouraged for all fields of information.

Policy 3.3: ICT action plans will be actively monitored to identify their impact on national and regional development.

Policy 3.4: Governments and regional organizations, the private sector and NGOs including religious groups will be encouraged to adopt appropriate management information systems for effective decision-making.

Policy 3.5: Governments and regional organizations, the private sector and NGOs including religious groups will actively co-operate to acquire and maintain ICT resources in order to optimize the overall regional development investment.

Policy 3.6: Governments and regional organizations, the private sector and NGOs including religious groups will actively co-operate to ensure that ICT policies are integrated in the development policies of all other relevant sectors.

Guiding Principle 4: Appropriate Policy and Regulation

> ICT policies and regulations will facilitate development of the sector and be appropriate to the people and cultures of the Pacific Islands.

ICT and related legal and regulatory frameworks in most PICTs are outdated, insufficient or non-existent to meet the challenges and opportunities made possible by rapidly developing technologies. Adaptation is needed urgently at the national and regional levels, based on a sound technical understanding and a realistic assessment of fundamental benefits, to ensure that the greatest possible economic and social benefits are gained from new developments while protecting social and cultural values.

Policy 4.1: Regional and national institutions will co-operate in the development of ICT regulations that are consistent with international and national laws, regulations, technical standards, and obligations.

Policy 4.2: Appropriate ICT and related regulatory frameworks will be developed that benefit the specific cultures, customs, and economies of the people of the Pacific.

Policy 4.3: ICT and related regulatory frameworks will be developed, based on legislation, to address socially undesirable activities.

Policy 4.4: ICT and related regulatory frameworks will promote open and non-discriminatory access to publicly accessible networks where appropriate.

Policy 4.5: National ICT and related regulations will balance and protect community and individual interests, including privacy issues.

Policy 4.6: PICTs and regional organizations will take a pro-active approach to representation and advocacy in regional and international fora in order to promote partnerships to resource the development of ICT for all Pacific Islanders.

ANNEXURE 6: Okinawa Charter on Global Information Society adopted at the G8 Summit held on 21-23 July 2000

The heads of state of the Group of Eight major industrialized countries, meeting in Okinawa, Japan in July 2000 for their annual summit, called for an international effort to eliminate the digital divide. They agreed that the following key principles will promote the development of the Internet and maximize its social and economic benefits:

Seizing Digital Opportunities

The potential benefits of IT in spurring competition, promoting enhanced productivity, and creating and sustaining economic growth and jobs hold significant promise. Our task is not only to stimulate and facilitate the transition to an information society, but also to reap its full economic, social and cultural benefits. To achieve this, it is important to build on the following key foundations:

- Economic and structural reforms to foster an environment of openness, efficiency, competition and innovation, supported by policies focusing on adaptable labour markets, human resource development, and social cohesion.
- Sound macro-economic management to help businesses and consumers plan confidently for the future and exploit the advantages of new information technologies.
- Development of information networks offering fast, reliable, secure and affordable access through competitive market conditions and through related innovation in network technology, services and applications.
- Development of human resources capable of responding to the demands of the information age through education and lifelong learning and addressing the rising demand for IT professionals in many sectors of our economy.
- Active utilization of IT by the public sector and the promotion of on-line delivery of services, which are essential to ensure improved accessibility to government by all citizens.

The private sector plays a leading role in the development of information and communications networks in the information society. However, but it is up to governments to create a predictable, transparent and non-discriminatory policy and regulatory environment necessary for the information society. It is important to avoid undue regulatory interventions that would hinder productive private-sector initiatives in creating an IT-friendly environment. We should ensure that IT-related rules and practices are responsive to revolutionary changes in economic transactions, while taking into account the principles of effective public-private sector partnership, transparency and technological neutrality. The rules must be predictable and inspire business and consumer confidence. In order to maximize the social and economic benefits of the information society, we agree on the following key principles and approaches and recommend them to others:

- Continue to promote competition in and open markets for the provision of IT and telecommunications products and services, including non-discriminatory and cost-oriented interconnection for basic telecommunications.
- Protection of intellectual property rights for IT-related technology is vital to promoting IT-related innovations, competition and diffusion of new technology; we welcome the joint work already underway among intellectual property authorities and further encourage our experts to discuss future direction in this area.
- Governments' renewed commitment to using software in full compliance with intellectual property rights protection is also important.
- A number of services, including telecommunications, transportation, and package delivery are critical to the information society and economy and improving their efficiency will maximize benefits; customs and other trade-related procedures are also important to foster an IT-friendly environment.
- Facilitate cross-border e-commerce by promoting further liberalization and improvement in networks and related services and procedures in the context of a strong World Trade Organization (WTO) framework, continued work on e-commerce in the WTO and other international fora, and the application of existing WTO trade disciplines to e-commerce,
- Consistent approaches to taxation of e-commerce based on the conventional principles, including neutrality, equity and simplicity, and other key elements agreed in the work of the Organization for Economic Co-operation and Development (OECD).
- Continuing the practice of not imposing customs duties on electronic transmissions, pending the review at the next WTO Ministerial Conference.
- Promotion of market-driven standards including, for example, inter-operable technical standards.
- Promote consumer trust in the electronic marketplace consistent with OECD guidelines and provide equivalent consumer protection in the on-line world as in the off-line world, including through effective self-regulatory initiatives, such as on-line codes of conduct, trust marks and other reliability programmes, and explore options to alleviate the difficulties faced by consumers in cross-border disputes, including the use of ADR mechanisms.
- Development of effective and meaningful privacy protection for consumers, as well as protection of privacy in processing personal data, while safeguarding the free flow of information.
- Further development and effective functioning of electronic authentication, electronic signature, cryptography, and other means to ensure security and certainty of transactions.

Further Readings

Bedi, Arjun S. 'The Role of Information and Communication Technologies in Economic Development—A Partial Survey', ZEF Discussion Papers on Development Policy No. 7, Centre for Development Research (ZEF), Bonn, May 1999. Available at http://www.zef.de/download/zef_dp7-99.pdf

Best, M.L. and Maclay, C.M. 'Community Internet Access in Rural Areas: Solving the Economic Sustainability Puzzle', In: Center for International Development, *The Global Information Technology Report 2001–2002: Readiness for the Networked World*, Oxford University Press. Available at http://www.cid.harvard.edu/cr/gitrr_030202.html

Camacho, K. 'Evaluating the Impact of the Internet in Civil Society Organizations of Central America: A Summary of a Research Framework', Fundacion Acceso, January 2001. Available at http://www.acceso.or.cr/publica/telecom/frmwkENG.shtml

Campbell, A., Harrop, A. and Thompson, B. 'Towards the Virtual Parliament—What Computers Can Do for MPs', *Parliamentary Affairs* Vol 52, Issue 3, 1999, pp. 388–403.

Gomez, R. and Martinez, J. 'Internet and Society: New Information and Communication Technologies for Social Development', Position Paper for the OAS Summit of the Americas, Preparatory Discussion on Connectivity, Draft, 18 October 2000. Available at http://www.acceso.or.cr/publica/telecom/REFL5-pppp-ENG.shtml

Heeks, R.B. *Re-inventing Government in the Information Age,* Routledge, London, 2001.

Horton, F.W. *National Information Policies: A Handbook on the Formulation, Approval, Implementation and Operation of National Information Policies*, FID, The Hague and UNESCO, Paris, 1997.

Lofgren, K., Andersen, K.V. and Sorensen, M.F. 'The Danish Parliament Going Virtual', *Parliamentary Affairs* Vol 52, Issue 3, 1999, pp. 493–502.

Lyons, C. and Lyons, T. 'Challenges Posed by Information and Communication Technologies for Parliamentary Democracy in South Africa', *Parliamentary Affairs* Vol 52, Issue 3, 1999, pp.442–450.

Malhotra, G.C. 'Automating Parliaments', *The Parliamentarian, Journal of The Commonwealth Parliamentary Association*, July 1995.

Mambrey P., Neumann, H-P. and Sieverdingbeck, K. 'Bridging the Gap Between Parliament and Citizen—The Internet Services of the German Bundestag', *Parliamentary Affairs* Vol 52, Issue 3, 1999, pp.480–492.

Mansell, R. and When, U. *Knowledge Societies: Information Technology for Sustainable Development*, Prepared for the United Nations Commission on Science and Technology for Development, Oxford University Press, 1998. Available at http://www.sussex.ac.uk/spru/ink/knowledge.html. *Knowledge Societies: Information Technology for Sustainable Development*, Oxford University Press, 1998.

March, J.G. and Olsen, J.P. *Democratic Governance*, Free Press, New York, 1995.

Mishra, S.N. 'House Infrastructure—Support Services for Indian's National Parliamentarians', *The Parliamentarian, Journal of The Commonwealth Parliamentary Association*, January 1997.

Organisation for Economic Co-operation and Development. *Examples of Information and Communication Technology (ICT) In National Development Plans as of February 2003.*

Perrault, R.J. 'Services for Members—Canadian MPs and the Resources for Representation', *The Parliamentarian, Journal of The Commonwealth Parliamentary Association*, January 1997.

Public Service Applications of the Iinternet in Developing Countries, UNESCO CI-2001/WS/04 November 2001.

Batchelor, S.J., Norrish, P., Scott, N. and Webb, M. Analysis and Overview of Case Studies—Research Report, Jan. 2003. Available from http://www.sustainableicts.org/fulloverview.htm

Talero, E. 'National Information Infrastructure in Developing Economies', In Brian Kahin and E. Wilson (eds.), *National Information Infrastructure Initiatives: Vision and Policy Design*, Harvard Information Infrastructure Project in collaboration with the Global Infrastructure Commission, 1997, pp. 287–306.

Also available

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ICT4D Sourcebook for Parliamentarians

This Sourcebook on Information and Communications Technology for Development, intended for parliamentarians and policy-makers, acknowledges the varying needs of both groups in different geographic, social, economic and political environments. It thus seeks to provide a broad overview of Information and Communication Technologies (ICTs) and their use as powerful tools for accelerating social and economic development.

The Sourcebook highlights the key and fundamental ICT for Development (ICT4D) issues by emphasising the importance of ICT4D policies, the development of national ICT agenda, the application of ICTs in specific sectors, and the role of government and members of parliament in the process of implementing ICT4D in their respective countries. Examples from the Asia-Pacific region are provided to demonstrate how different stakeholders have successfully applied ICTs to bridge the digital divide with concrete socio-economic benefits.

The Sourcebook also seeks to provide and equip parliamentarians and other decision-makers in government with key skills required to evaluate and monitor ICT initiatives within their respective nations with emphasis on the importance of analysing the objectives of ICT4D programmes, determining appropriate ICT components, empowering and encouraging stakeholder participation, and evaluating the eventual outcome of ICT4D initiatives.

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