DRAFT FOR COMMENTS ONLY

e-Primer
on
ICT Policy Formulation and e-Strategy Development

DRAFT

by

Richard Labelle

Asia-Pacific Development Information Programme
United Nations Development Programme
www.apdip.net/asian-forum

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ABSTRACT

The objective of this e-primer is to explain the nature of people focused ICT policy formulation and ICT strategy development in plain and straightforward terms. Using examples and practices drawn from Asia and from around the world, the e-primer discusses the place of ICT policymaking in development, in the fight against poverty and in the achievement of the Millennium Development Goals (MDGs). It focuses on ICT policies that can be applied to deal with these and related development issues, the steps taken in developing ICT policies, including appropriate e-readiness assessment methodologies, participatory methodologies and visioning exercises, some of the questions that need to be considered in developing an ICT strategy, the sectors that ICT policy making needs to deal with and the approach to ICT action planning. Related topics covered include: strategies for various sectors or dealing with certain issues including: information access, e-government, e-business and e-commerce in particular, e-health, ICTs applied to learning at all levels, ICT for scientific research and development, ICTs for local and community development as well as the development objectives and outcomes sought through an ICT strategy. Some of the principles of implementation that need to be considered from a human development perspective are outlined and discussed.

INTRODUCTION AND BACKGROUND

The objective of this e-primer is to explain the nature of ICT policy formulation and ICT strategy development in plain and straightforward terms. The presentation will be inspired by and highlighted with examples and cases drawn from around the world with special focus on Asia and the Pacific. The focus is on ICT policy development from a human development perspective.

ICTs - background and definition

What are ICTs?

Information technology (IT) is "a fancy name for data processing". IT means all equipment processes, procedures and systems used to provide and support information systems (computerized and manual) within an organization and those reaching out to customers and suppliers[1]. The term information and communication technology (ICT) was coined to reflect the seamless convergence of digital processing and telecommunications.

ICTs include hardware, processes, and systems that are used for storing, managing, communicating and sharing information. These tools can be either manual or computerized (digital)[2,3]. This definition of ICTs extends to older

[1] Newton, H. 2002. *Newton's telecom dictionary. 18th Ed*. New York. 859 pp.
[2] Duncombe, R and R. Heeks, 1999. *Information, ICTs and small enterprise: findings from Botswana*. Development Informatics. Working paper Series. Working Paper 7. Institute for Development Policy and Management. Manchester, U.K. 18 pp. http://www.man.ac.uk/idpm/idpm_dp.htm#devinf_wp. Duncombne and Heeks consider that ICTs only deal with digital information.

non-digital devices such as analogue radio and television. Beyond hardware i.e. computers, wireless devices, telecommunications towers, etc., ICTs include computer software and associated systems such as management methods and practices, the so-called application layer.

The Internet is a worldwide network of computers connected according to a robust digital technology called the IP protocol, which permits the efficient routing, transmission and management of bits and bytes of data between computers. Mobile devices such as cellular or mobile phones are one especially important class of ICTs.

ICT diffusion and access to information

ICTs continue to diffuse at a rapid rate all over the world. The information economy is a fact and there are impressive statistics and other evidence to prove that ICTs do make a difference to the competitive and comparative advantage of nations, organizations, communities and people. Some consider the extent of ICT adoption of ICTs as a prime factor in the rapid development of countries. By one account, ICT diffusion accounts for up to 90% of the increase in the Human Development Index (HDI)[4] observed in some nations. It is clear that ICTs have an important role to play in fighting poverty and in achieving the Millennium Development Goals (MDGs)[5].

This e-primer starts from the perspective that ICTs are not an end in themselves. ICTs are tools to empower people and communities to become self sufficient in meeting their basic needs, and more, in helping people reach their full potential as individuals and as a community. The agent of change and of empowerment is information. Access to information helps people identify and seize opportunities to grow and develop, and to better their lives and that of their close ones and of their families and communities.

The international community also recognizes the importance of access to information. The ability to use information and to communicate is fundamental to human welfare. In Section 19 of the Universal Declaration of Human Rights, the international community via the United Nations recognizes that "*Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers*"[6].

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[3] To distinguish between analog and digital ICTs, the French term is new ICTs (nouvelles technologies de l'information et de la communication – NTIC).

[4] Trujillo-Mendoza, M. 2001. *The global digital divide: exploring the relation between core national computing and national capacity and progress in human development over the last decade.* Doctoral dissertation. http://studentweb.tulane.edu/~mtruill/index-phddiss.html

[5] DFID. 2002. …

[6] Office of the UN High Commissioner for Human Rights. *Universal Declaration of Human Rights* http://www.unhchr.ch/udhr/lang/eng.htm

ICT roll-out in Asia

ICT roll out in countries of Asia has been impressive. A companion report in this e-primer series shows some of the significant achievements of the countries of Asia[7]. More to come on this…

ICT deployment in Asia … (Idem)

The changing international policy environment

As the information economy becomes predominant, efforts to streamline its operation or at least encourage greater collaboration have been the object of much effort through international mechanisms. One of the most important of these mechanisms affecting ICT diffusion and use has been the agreements negotiated under the World Trade Organization (WTO). 146 countries now adhere to the WTO agreements, which regulate international trade. This includes 30 of the 46 countries listed by the United Nations as least developed countries[8]. The objective of these agreements is to open up trade generally. These agreements are considered the political cornerstone or underpinning of globalization.

Of special interest to ICT policy formulation are the trade rules of telecommunications regulation and licensing. These rules are especially important in opening up the telecommunications sector to competition and foreign investment, a prerequisite to increasing information flows and for encouraging the diffusion of ICTs. Until the conclusion of the WTO agreements, the telecommunications markets in most countries had been closed to competition and had been operated by de facto monopolies, the national telecommunications operators. This is still the case in many of the non-signatory countries and is changing slowly in some of the signatory countries as well. For signatories the end result will be similar in all cases – more open national and international markets for telecommunications goods and services.

Since the WTO, change is taking place rapidly and dramatically with the result that telecommunications services have become more competitive, and the Internet has grown as a result, bringing advantages to consumers and the private sector as well as governments.

There are two basic WTO agreements that are of concern, the General Agreement on Trade in Services (GATS) and the Agreement on Basic Telecommunications (ABT). These agreements provide for the opening up of national telecommunications markets to foreign investment and competition. Specifically, the agreement states: "… governments must ensure that foreign service suppliers are given access to the public telecommunications networks without discrimination"[9].

[7] Lallana, E. C. 2003. *Comparative Study of ICT Policy and e-Strategies in Asia*. 27 pp.
[8] http://www.wto.org/english/thewto_e/whatis_e/tif_e/org7_e.htm
[9] http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm6_e.htm

Another relevant WTO agreement touches on intellectual property rights (IPR). A regime that better protects IPR is essential to share the benefits of research and development and to take full advantage of ICTs, the Internet and the information economy. At present, enforcing IPR regimes is an extremely costly undertaking and only well endowed companies and nations can afford to do so. The result is that many smaller or poorer companies and countries cannot enforce the requirements of IPR or ensure that their own claims are respected beyond their own jurisdictions.

The management or governance of the Internet IP address naming system and the allocation of IP addresses is another issue of broad concern to the preparation of ICT policies. Here the issue is ensuring that access to IP names and classes is equitable and that each country and eventually user can be guaranteed reasonable access to the number and type of IP addresses they require. In some countries, Internet naming systems have been commandeered by operators interested not in ensuring that the greatest number of addresses are made available, but on maximizing their profits, to the detriment of Internet development.

The Internet Corporation for Assigned Names and Numbers (ICANN) has been created as a consensus based private sector organization to overview the allocation of IP addresses. An international board representing users from around the world governs ICANN. A test is ongoing to promote competition in the allocation of Internet domain names. This could lead to more than 52 entities with authorization to compete in selling domain names and related services[10].

Box 1. Definition of the information economy[11]

> The term "information economy" refers to "a new global electronic structure, wherein the production of information goods and services dominates wealth and job creation, and is underpinned by the use of information and communication technologies (ICTs) and the global information

Policies for what?

Policies are the clearest expression of intent of governments and of other organizations. ICT policies deal with issues related to information dissemination and use as well as issues related to the use of the technology itself. This primer considers both. For the purpose of this discussion, legislation is considered part of policy. In fact, legislation enshrines policy.

One of the main objectives of ICT policies and strategies is to ensure the greatest diffusion of ICTs possible in a fashion commensurate with national needs, ambitions, specificities and concerns. As a result of this broad

[10] http://www.icann.org/general/background.htm

[11] Cogburn, D. 1999. *Globalization and the information economy: challenges and opportunities for Africa. African Development Forum.* ADF '99. www.un.org/depts/eca/adf/pub.htm. Taken from James, T. 2001. (See below).

ambition, information and ICT policies must take into consideration local, national and international issues as well as sectoral concerns. An ICT policy for national development requires policies for learning and education in particular, government, private sector and industrial development, for local and community development, for empowering women and other groups, for promoting research and development in the pure and especially in the applied sciences, for ensuring that content on the Internet is relevant and reflects national specificities, etc.

ICT policies and strategies need to be integrated into broad development concerns and need to be mainstreamed into all aspects of development planning. Because these issues are largely cross cutting and interrelated, a participatory mechanism is essential to ensure that policies will correspond to real concerns and to ensure buy-in by stakeholders. For the same reason it will be useful to consider establishing an independent entity created by the government or as an independent organization or nor for profit association to manage and implement the ICT strategy.

Sectoral concerns in the development of ICT policies and strategies

These concerns can be arranged as follows:

National development goals
National vision
Broad sectoral issues dealing with:

- Government
- Telecommunications
- Private sector (e-commerce)
- Health
- Learning (education, research and training, including life long learning and professional development)
- The ICT industry
- Research and development (part of learning, but focused on science and technology)
- Internet and especially WWW content
- Local and community development

Why are ICTs important for human and economic development?

ICTs enhance all forms of information exchange. Observation, learning and decision-making are facilitated and business transactions are expanded and speeded up. Opportunities can be identified and acted on more easily. Markets operate more efficiently and are more accessible. These lead to business related efficiencies and faster turn over, increased productivity and profitability. The widespread use of computers has resulted in significant increases in productivity, especially in the services sector [12].

[12] United States. 2001. *Annual report of the Council of economic advisors*. United States Government Printing Office, Washington, D.C.

As eBay has demonstrated, virtually anything can be bought or sold over the Internet using online marketplaces. Asian countries have recognized this and so have many entrepreneurs. Several online markets – so called horizontal marketplaces - have been established to expand access to Asian goods and services[13]. Indeed, for China, facilitating access to international markets for Chinese goods and services is one of the most important drivers of ICT policy.

It is not just large corporations that have realized the advantages of the Internet. In Huoshan county, one of the poorer counties of Anhui province in China, an agricultural information service connects several counties, townships and villages. A network combining door-to-door information collection and exchanges (sneaker nets), telephone, Internet via dial-up, small single operator agricultural information offices located in townships and larger Web enabled centres in municipalities have been established. In the municipalities, the county Web sites market local produce nationally and internationally and match needs for agricultural produce, especially cash crops such as medicinal plants, prized mushrooms, bamboo products, etc. This service facilitates contact and promotes exchanges between buyers and sellers and contributes to extend and enhance the local agricultural market while helping small scale farmers to bypass middlemen and obtain valuable information.

The expectation is clearly that e-commerce will become essential for international trade. Early adopters will win. To win, countries must transform themselves into information economies and knowledge based societies. For many countries, including many Asian countries, this is the basis of their ICT policies.

What have been the advantages for people of access to ICTs?

Information opens up more possibilities and opportunities for people. Information and knowledge empower people to become more self sufficient in one way or another. With the increased capacity to access information that ICTs bring, people can take advantage of more opportunities and can better assume their own responsibilities and seek a better life for themselves, their families and their communities. ICTs just make information acquisition and management easier and more efficient. ICTs are found in all areas of human activity and ICT policy making will have to take this into consideration.

Advantages of using ICTs:

- Access to information for private and professional decision making: ICTs expand the range of choices and opportunities by facilitating greater access to economic, educational and development related information

[13] Momentum Technologies. 2003. *Horizontal marketplaces in Asia*. http://www.sourceguides.com/markets/byI/horizon/byR/Asia/Asia.shtml

- Geography and distance become less of a consideration with ICTs. Research is much easier with ICTs and the Internet especially
- Access to opportunities: ICTs empower individuals, businesses and especially SMEs, local and community groups, women and marginalized or disenfranchised people or groups to do what they do, only better. With ICTs and the capacity to use ICTs, these groups can access the same information that government and large corporations use. Access to information can contribute to leveling the playing field by increasing participation in economic and human development activities and in those applications that depend on information such as markets
- Greater ability to learn: distance learning permits students in Djibouti to get accreditations online from recognized French universities
- Greater environmental awareness: information about the weather and the environment in general is more readily available. This information can help to predict and prepare or environmental perturbations and catastrophes. In Sub Saharan Africa, earth observation is used to predict crop failure and prepare for emergency food relief[14]. FAO maintains another such site with a global purview[15].
- More awareness of factors affecting individual well being
- Greater ability to influence and participate in decision making
- Transaction processing: ICTs speed up and ease transactions of all types, and are especially important for business and government transactions
- Trade: ICTs enhance and facilitate trade. ICTs make markets more efficient. Commerce is enabled and extended. All markets have the potential of being international or of being selective, depending on the case

ICTs facilitate access to information – ICTs enable while information empowers. ICT policies make it easy to access info and use ICTs and open up more opportunities for people, communities, organizations and countries.

Approaches to ICT policy formulation

Use a development approach as per the Digital Opportunities Initiative report

What are the possible approaches to ICT policy formulation? The Digital Opportunities Initiative (DOI) is a research project completed in 2001 by UNDP, the Markle Foundation and Accenture that examined the evidence of ICT diffusion around the world and looking at the evidence of success and failure. When contrasting the different policies adopted by various countries, it became clear that those that were most successful in making beneficial use of ICTs for national development had adopted an integrated approach to ICT diffusion. Instead of focusing on ICT deployment in a given sector of the economy, such as software development or for industrial development,

[14] Famine Early Warning System – FEWS-Net. http://www.fews.net/networks/
[15] http://www.fao.org/WAICENT/faoinfo/economic/giews/english/alertes/sptoc.htm

countries that used a broader and more general approach to ICT deployment were more successful in meeting their objectives and in ensuring that ICT diffusion benefited as many people as possible. This multi-pronged approach builds the capacity of society as a whole to use and benefit from ICTs. The evidence is clear, mainstreaming is the approach to take in ICT policy formulation for national development.

Along with this approach, a cross-disciplinary one is required. There are some common issues, related to infrastructure, as well as issues related to need.

Policies should be expressed in terms of their development objectives

In practical terms, this means that ICT policies should related directly to a development objective or outcome. In ICT strategic planning exercises that we have undertaken, we have found it easiest to explain the intentions of the policies and decisions that accompany policy proposals if they can be related to the production or creation of some sort of public good, for example, greater access to educational opportunities or to jobs. So instead of a policy on infrastructure – for example the creation of a metropolitan area network (MAN) - it is easier for stakeholders to speak in terms of the development outcome sought: to build the capacity of a city to take full advantage of the most recent information access technologies to enhance competitiveness and to strengthen the business sector. The immediate objective here will be to create the network.

In summary, the following principles of ICT policy and strategy development and implementation are proposed:

- Promote the greatest access possible to information and ICTs consistent with national and human development goals
- Be consistent with the DOI report: an integrated and pro-development approach works best where impacts on people are the main outcome, not technology deployment
- Base policies and interventions on local needs assessments and on what the market can bear. Realism: many national strategies will never be implemented because they do not correspond to local and international realities
- A participatory approach at all steps in the development and implementation of the vision and the ICT strategy. Consult widely and often and don't forget the poor and rural dwellers.

Other complementary approaches have also been suggested[16]. Accascina suggests six components listed below as part of a multi-pronged approach to

[16] Accascina, G. 2001. *Information and Communication Technologies (ICTs) As Development Tools*. Background paper commissioned by the Italian Government. 17 pp. http://www.it4dev.net/papers/ICT_in_DC.pdf

information-driven change within and across developing countries and regions:

1. Coordination of ICT policy within and across countries;
2. National level assessment of the present ICT situation, problems, opportunities and trends;
3. Information access and availability of technical capacity;
4. Multi-level human capacity building;
5. Government information systems designed for efficiency, transparency and equitable access, including access to social services; and,
6. Information and communication technology applications and interventions for poverty alleviation.

In a current review of National Information Society Policies, UNDP's approach, which is based on the DOI report mentioned previously, is summarized as follows[17]:

a) An accent of development issues
b) The centrality of policy frameworks (the potential benefits of ICTs are conditioned by the existence of an appropriate enabling environment)
c) An emphasis on a multi-stakeholder participatory approach
d) The criticality of partnerships.

ICTs in the fight against poverty[18]: is there a relationship?

Using or accessing ICTs per se is not the development goal or outcome looked for in ICTD projects, programmes or activities. The development goal is not to bridge the digital divide per se. The goal is to promote human development and to reduce and eliminate poverty as a result[19]. To achieve this goal, it will be necessary to bridge the digital divide.

ICTs, as part of a broad based strategy for human development, facilitate greater access to information, resources and people as a way of empowering change for human development. The real goal is empowerment through information. The outcome is people and communities, including organizations and development actors especially, who can better manage their own destiny and reach their own human development objectives because they are informed and because they are knowledgeable and can act on decisions that influence them.

[17] Rohozinski, R. 2003. Draft - Practice note on national information society policies (e-strategies). Practice note. UNDP. 22 pp.Version. 1.0a 10/07/13 (RR)
[18] Labelle, R. 2003. *Information and communication technologies (ICTs) for development in national human development reporting*. 69 pp.
http://hdr.undp.org/docs/nhdr/thematic_reviews/ICTs_Guidance_Note.pdf
[19] Marker, P. McNamara, K. and Wallace, L. 2002. *The significance of information and communication technologies for reducing poverty*. Department for International Development. London. 64 pp.

While these objectives are worthy of support, the fact is that many ICT strategies focus on economic development as the primary outcome of ICT strategic planning.

Setting National ICT Vision and Priorities

A vision is a statement of great expectations for the future, which documents outcomes that the country or jurisdiction wishes to arrive at in a given time frame. Vision statements are always upbeat and ambitious. Knowing what a country or jurisdiction wants and what it can achieve, agreeing on this and communicating it as widely as possible are some of the outcomes that visioning contributes to.

A national vision describes a desired future end state with specific outcomes that the country or jurisdiction wishes to arrive at in a given time frame. A vision statement could be written for an organization, a community or even a household, it could even incorporate personal goals. Vision statements can and probably should include quantitative results such as the number of computers per user, the number of devices that will be available, the % of GDP that can be assigned to the introduction and deployment of ICTs, etc. With quantitative results or measurable outcomes, comparative analysis and benchmarking is possible.

Many countries have developed visions of the future where ICTs are seen as a factor of transformation to achieve a desired state. Invariably, this future state is e-enabled. Some of the best known include the Malaysia's Vision 2020 which foresees Malaysia becoming an industrialized country by 2020. In Malaysia's vision 2020, ICTs…

In Botswana, vision 2016 proposes "Prosperity for all", of which one tenet calls for Botswana becoming an educated and informed society. The national vision for Canada is based on rolling out infrastructure to "make the information and knowledge infrastructure accessible to all Canadians making Canada the most connected nation in the world".

In visioning and in developing ICT strategies, it is important to think strategically of ICTs as enablers of human development and to consider what enhanced access to information can do to improve the lives of people. In thinking strategically of the role of ICTs and of information for development, the place to start is to identify the development priorities and challenges facing the country. On the basis of a description of the current development situation, then it is possible to consider the extent to which greater access to information and ICTs can contribute to bettering people's lives.

The national ICT vision statement

A national vision statements speak to what a country or jurisdiction wants: tomorrow, in 3 years, in 5 years and in 20 or more years for its people, for society and for the economy and what place does it want to occupy in the community of nations? Many vision statements have been derived from an

inspirational leader – Singapore, Malaysia. Many are based on consultation. Visioning exercises can also help develop a vision.

Visioning exercises

Visioning exercises are brainstorming exercises applied to scenario building about the future. They can also be very effective in outlining a shared vision and in securing support for its implementation. Visioning exercises[20] require defining personal, community and national goals.

E-readiness assessments can be helpful sources of information for visioning exercises, especially if they are more focused on people instead of only documenting hard evidence of technical diffusion.

Visioning is an engaging exercise. Thinking about a future state of affairs can captivate people's imaginations. Everyone has a view of what he or she would like to see for themselves, their children and their communities for the future. As a communication tolls, visioning exercises can be very effective.

Visioning works well at the corporate or community level, but does not appear to have been used much at the national level or in situations where large numbers of people are involved or could be involved. Visioning exercises can be a first step in strategic planning.

Agreeing on priorities: how?

Priorities can be agreed through consultation and negotiation. In the event that this does not work, then the time may not be right for launching such an initiative or the initiative should be considered on a smaller scale or only in part of a jurisdiction for example or to deal with some specific issues or sector.

Development outcomes brought about by ICTs and access to information

ICTs and information help people lead better and fuller lives. The development outcomes sought contribute to human development and to the achievement of the MDGs. The same approach used in development planning, and especially in planning human development outcomes needs to be considered when planning for using ICTs. Development planning operates on all sectors of the economy, at all levels of society throughout the geographic range of the jurisdiction concerned. Outcomes should benefit all of these sectors and levels and act throughout the country. The same applies for planning for the use of ICTs for national development.

At the national level, the outcome sought will invariably lead to a higher level of development based on economic indicators and indices of human development such as the Human Development Index (HDI). Countries will want to promote national self-sufficiency and the capacities of citizens to find

[20] See: World Resources Institute. How to conduct a visioning exercise? http://www.wri.org/enved/suscom-vision.html and

meaningful employment. Malaysia provides a good example: by 2020, Malaysia will be an industrialized country according to accepted norms for defining an industrialized country, norms based on those set by the OECD Development Assistance Committee. This implies a whole set of societal transformations required to develop and apply the capacity required to meet this outcome and overcome any given constraints.

However, it is also important to think in terms of more local areas of intervention and the outcomes that are sought at this level. Local and community development is invariably a benefit sought in development planning. ICTs for local and community development means thinking about outcomes that will benefit regions, municipalities and cities, towns and especially smaller communities and more remote areas. While countries will consider how to transform themselves into information and knowledge-based societies, communities may want to think in terms of smart cities or regions or in terms of community based sharing in the benefits of greater access to information and knowledge for local economic and human development.

Examples of development outcomes sought

Outcomes for people and communities

- There are two overarching outcomes sought for people. ICTs should contribute to self-sufficiency and empower those who use these tools as measured by income, employment, level of education and job satisfaction figures for example

National outcomes

- A higher level of development as measured using the HDI and economic indicators such as GDP, GNP, etc.
- Greater participation in the global economy as measured by figures for trade and exports in goods and services
- More economic growth and diversification as measured by GDP in general and contributions from many different and diverse sectors to the economy
- More equitable distribution of economic benefits throughout the country and across sectors of the economy and throughout different levels of society. Poverty levels and marginalization should decrease
- Specific sectors increase their contribution to GNP
- Employment figures increase. More women are employed in e-economy related tasks for example
- ICT use increase 5 – 10 x or more over time: PCs, bandwidth, hosts, servers, cell phones, certified staff, businesses, investment, content
- The national or local share of content on the World Wide Web increases
- There is an increased share of GDP derived from use of ICTs

Outcomes by sector

Government

- Development objective: Modernization of the civil service or the transformation of the civil service into a service based operation with the citizen as the main beneficiary
    - ? Collaborative software tools encourage sharing and opening up and the development of an information culture in the civil service and among and between parliamentarians
    - ? Greater access to government decision makers and to civil servants helps instill a service mentality among civil servants and government bureaucrats in general and helps transform the government into a service oriented organization
- Improvements in governance because:
    - ? Government decision makers more accessible
    - ? Easier access to government information and services
    - ? More equitable access to government opportunities: contracts, jobs and procurement in general
    - ? Greater transparency in government business, including parliament and in procurement especially
    - ? Greater efficiency in government operations
    - ? Increase communication between parliamentarians and their constituents
- Support for government decentralization efforts by strengthening communication and collaboration between local, regional and national levels of government
- Governments become more solvent and better able to respond to public needs as a result of:
    - ? Use of e-enabled customs clearance services which brings in much needed tax resources and reduces rent seeking behaviors and other forms of corruption
    - ? Efficiencies and cost savings incurred through the use of ICTs
    - ? Reductions in the number of public employees
    - ? Increased efficiency in tax collection as a result of electronic registration of businesses and integration of computerized systems. Online collection of taxes may also contribute

Private sector

- The cost of doing business decreases as a result of increased access to ICTs and telecommunications infrastructure as well as increased efficiencies resulting from the use of ICTs. This may not be applicable to all types of businesses. Small and medium sized enterprises (SMEs) and businesses that are set up in rural and poorer areas may not have the human capacity or access to the infrastructure to take advantage of these tools.
- Markets become more accessible and more efficient. This is brought about by greater to information about the market and its operation. Business operators and investors at all levels and across a country and

even beyond can participate in a market. Examples have already been given
- More job opportunities for women in ICT services[21]
- Transaction processing decreases as a result of the widespread use of e-business technologies and practices, and especially as a result of the use of electronic data interchange (EDI) and electronic funds transfer (EFT)
- The economy becomes more open to foreign scrutiny and investment as a result of greater access to information and advice online
- Opportunities for tourism increase as a result of an increased online presence advocating and selling tourist experiences in country
- More investment, business development and job creation as a result of:
    - Creating an enabling environment that constitutes a comparative advantage that is such that it compels investors to locate their businesses in the jurisdiction in question (example: Costa Rica and its efforts to attract Intel to establish a plan in Costa Rica; and Singapore that has created a business friendly environment for research and development that has attracted many companies to establish their regional operations here)
    - Accessible ICT infrastructure
    - Access to infrastructure and incentives, as well as a trained and technically competent work force

Education and learning

- Better educated citizens as a result of:
    - Increased access to learning opportunities as well as formal education
- Better and more learning experiences
    - More learning resources available online and in the right language(s) and formats
    - Increased access to learning materials in local languages
- A better qualified work force in general and more qualified technicians and managers especially
- Greater access to education and learning opportunities for all, and especially for girls and women who may not be able to take advantage of these opportunities for cultural or religious reasons in some societies
- More effective use of teaching resources
- Increased efficiency in teaching
- More graduates able to meet internationally accepted educational levels and skills. More access to higher education and specialized training
- More opportunities for life-long learning.

[21] United Nations Conference on Trade and Development. 2001. *e-commerce for development report 2001*.

Research and development

- Increased quality, relevance and capacity of national research
- Create a research and development base to support national ambitions as well as the needs of society as a whole and of the private sector in particular
- More research collaboration and networking, increased participation in international research activities, meetings, consortia, more access to international research grants and funds, exchanges and public / private partnerships leading to increased investment in research and development as well as investments in private research and development activities

Health

- A healthier population. A disease free and AIDS free population. This can be sought as a result of:
    - ? Increased access to quality health care for all
    - ? Increased awareness of disease risks, especially those associated with sexually transmitted diseases (STDs)
    - ? Increased access to health information and services, including specialized diagnosis and prevention information, as well as increased participation in international disease prevention and early warning networks and systems (World Health Organization, the Center for Disease Control in Atlanta, USA, etc.)
    - ? Increased health research networking and access to relevant health sciences information and databases. Opportunities to take advantage of health research
    - ? Increased effectiveness of health care and disease early warning and prevention efforts. The same for disease treatment (international monitoring and early warning of epidemics)
    - ? Better ability and capacity to follow-up and treat chronic diseases such as tuberculosis and HIV/AIDS (anti-retroviral treatments and follow-up using SMS - see below)

Local and community based groups and organizations

- Viable rural communities as a result of access to ICTs connecting these communities to the mainstream of economic and social activity. This can be achieved as a result of community based access services and connecting schools, health centres, local administrations, local businesses and individual residences to the Internet

NGOs and special interest groups

- NGOs better able participate in community and national life as a result of increased awareness and access to resources and other like-minded groups and organizations nationally and otherwise.

Women's groups

- Increased awareness of and access to opportunities in education and work for women
- More networking of women on issues of common concern.

Brainstorming ICT strategies – some considerations

Developing ICT strategies is a collaborative effort because that requires the participation of many people. The quality and success of the strategy setting exercise will increase with the number of different stakeholders and development actors involved, up to a point. The same can be said for visioning exercises.

In developing ICT strategies, the following issues should be taken into consideration:

- Think "outside of the box". Look at information and ICTs in all walks of life, in all sectors of the economy and at all levels of society across the country. It is important to go beyond the technology and think about needs and about applications that can answer these needs
- Don't forget the rural dwellers and the poor as well as others who may be marginalized for any of a variety of reasons
- Engage as many stakeholders in thinking about this
- At the national level, think about how ICTs and greater access to information can provide the impetus to national development
- Track development and technology issues using the Internet and learn from that "online intelligence". Identify the trends that are most likely to impact nationally or at the community level
- Don't forget radio and television as well as wireless technologies. The latter are especially useful for reaching people more used to voice based communications
- Look for compelling examples and success stories that capture the imagination of people, especially young people. Cite examples: Estonia, China, Hong Kong, India, Singapore, etc.

What scale for national strategies? Should everyone be included?

Strategies for ICT deployment can be undertaken at the national level or for other scales such as a regional or provincial level. In many countries around the world, municipalities have developed ICT strategies sometime called smart city strategies. A Google search using "smart city" will uncover many of these. For development planning to be a success, participation is required. If participation includes all levels and all sectors and touches all parts of the country or jurisdiction in question, then it stands a better change of capturing the true needs and concerns of the public and of special interest groups. The national strategy will better reflect local and regional and other concerns. For

this, a communication and consultation plan should be an integral part of policy planning and policy making activities.

Most national strategies do not include extensive assessments at the local and community level however. The cost of assessing representatives of key groups across a country is a limiting factor. Several assessment methodologies, as mentioned elsewhere in this document, do not consider the less economically or commercially active members of the country. This is also because some of these assessment methodologies are focused on immediate or existing evidence of ICT use. These assessment methodologies are less likely to consider a longer-term horizon and social or developmental issues.

Another reason is that many assessment methodologies focus on harnessing ICTs as an engine for growth, and the poor are of course not considered engines of growth and invariably escape such an analysis. Because rural areas are also likely to be less industrialized and have less infrastructure, and are also the locus of many poor people, these areas are invariably overlooked. This may lead to ICT policies focused on economic development or on high profile activities. A favourite policy proposal among many national ICT planners calls for the creation of a TechnoPark as a way of attracting the large international manufacturers in the ICT industry to establish their offices and regional centres in the countries concerned.

National ICT policies need to fit into a strategic whole. They need to make sense to the country or jurisdiction from a development perspective. A complete ICT strategy needs to consider ways of using ICTs to meet the development needs of the poor and marginalized people, as well as those of the economically productive elements of society, of everyone. The economic, social and other costs of not doing this can far exceed the intended benefits of high profile policies focused on niche outcomes.

The poorer they are – the more they need to be understood and assessed

In general, the less ICTs have penetrated a society or community, the more likely it will be to learn from the community about their development needs and circumstances, and especially about their priorities for information (what information do they need, for which purpose and how do these needs rate on a relative scale of priorities). It will also be important as part of this learning process, to learn about the information sharing behaviour of people in the community: what are their favourite communication media and what use is made of these and to answer what type of information needs. This has been recognized in the form of information audits and information needs assessments and has been applied with useful results in the case of the Solomon Islands People's First Network (PFNet) [22].

Most countries, immaterial of their level of ICT use, have a digital divide to deal with and invariably this will be in areas of poverty or where there are few

[22] Fortier, F. 2003. *Practice Note on ICTs for Rural Poverty Reduction*. Draft, August 2003. ICTD and Poverty Reduction Groups. UNDP. 16 pp.

people and little by way of infrastructure and markets. National policies and the national strategy must reflect this.

Because it is impossible to consult with everyone, efforts should be taken to communicate with the public and special interest groups and stakeholders about the ICT strategy. Public meetings and the media should be used to inform people, to raise awareness and to build support for the strategy setting exercise as well as for other aspects of the ICT development plan. As mentioned, a communication plan is part of policy-making initiatives to help build support for the preparation of the policy and for its implementation.

As part of ICT strategy setting exercises, surveys and assessments need to be undertaken to describe the current situation and to help identify and rate the needs and challenges that planners and strategists need to be aware of.

A national ICT strategy does not preclude developing strategies that apply to smaller jurisdictions. Beyond the city type of strategic plans such as the Smart City plans mentioned previously, community development strategies that seek to take advantage of ICTs for local development should be encouraged. By bringing the planning process closer to home, people are more likely to be involved.

There are communities that have developed and adopted strategies to use ICTs in order to overcome isolation and a sense that central government decision makers are not aware of their concerns and anyway cannot adequately deal with these. In Jamaica, the Bluefields Peoples' Community Association (BPCA) was created to support the community in achieving its development goals[23]. BPCA allowed the community to reach beyond the confines of the local scene and seek resources and collaboration overseas. ICTs are a part of the development strategy of Bluefields and have been so for some time.

In summary, a national ICT strategy needs to consider everyone.

The inter-relationship between ICT policies, ICT Legislation, and e-Strategies

Governments develop policies. Legislation enshrines the policies in law. Strategies direct the body of policies and constitute a framework for policy implementation. Individual policies themselves are rather meaningless. A strategic framework is necessary to give policies personality and direction.

Strong leaders and strong governments in Asia have ensured that ICT strategies involve regulations and oversight mechanisms to ensure compliance. Policy statements and laws in themselves may not be sufficient to bring about the change that is sometimes necessary to transform business practices in a way that allows the greatest possible diffusion of ICTs. While government sets policies, people need to be involved in developing these

[23] http://www.bluefieldsjamaica.org.jm/bpca/index.html

policies. Ongoing consultation with stakeholders is a requisite for successful implementation of development policies, including those that apply to the diffusion of ICTs.

At the international scale, the WTO agreement have been able to bring about meaningful change in business practices and telecommunications policies to support a more level playing field in the provision of telecommunications and related services at the national level.

While legislation is a necessary step, the law is not enough in of itself. One of the greatest concerns is the application of the law and of regulations and the issue of jurisprudence to guide legal decisions, to guide judges dealing with what may be for them a new area of jurisdiction and legislation. Countries without a strong regulatory mechanism can have the best of laws and intentions, but it they cannot be or are not applied, they are not useful and may in fact constitute an impediment.

The effectiveness of the courts, the capacity of people and associations to seek and obtain legal redress and the perceived equity of the government in general and of legal decisions in particular will greatly affect the involvement of people and the buy in or support necessary for the success of the strategy and its development objectives. Furthermore, prospects for outside investors to contribute to the implementation of the ICT strategy and associated actions plans will also be affected by these issues, as the World Economic Forum competitiveness surveys demonstrate – foreign investors being particularly sensitive to the reputation of the courts as being equitable in their treatment of foreigners and especially foreign investors. In general, issues that affect foreign direct investment (FDI) are also going to have a bearing on the implementation of ICT plans and strategies inasmuch as foreign investors - as sources of expertise, funds and other resources - are considered partners in the strategy and its implementation.

Putting together an e-strategy – the components

There are several parts to an e-strategy: the assessment, the vision, the strategic plan itself, the action plan or master plan for implementation, the consultation plan and the institutional mechanisms for implementation and oversight, as well as monitoring and evaluation.

The assessment sets the stage and is based on consultation, research, facts, figures, perceptions and observations[24]. A policy is a component of a strategy, one sentence in a chapter or a book that says what the organization or jurisdiction in question wants to achieve and how, and that justifies the policies and actions that are necessary to achieve a desired goal. The strategy justifies the vision and makes a rational case for fulfilling the vision and showing how this can come about. A strategy explains the situation, outlines and analyzes the options and makes recommendations for action. The Action Plan is the implementation plan for the strategy. The Action Plan

[24] The World Economic Forum Africa Competitiveness report is based on perception and observation.

can include detailed projects, their outcomes, and indicators of success, intended results and their justification, risk assessment and mitigation, cost and other detailed resource requirements. The Action Plan includes a schedule for implementation.

Ongoing consultation is the norm – and steps have to be taken to ensure that this is the case and that representation is assured, especially from marginalized or underrepresented groups such as women, the poor, rural dwellers, youth, the handicapped, etc. However, in fact, this is not always the case.

The institutional arrangements for implementation may include a dedicated organization usually associated with or attached to a high-level government decision-making body such as Parliament or the Office of the President or the equivalent as the agent responsible for the strategy and for the Action plan. The dedicated organization has the authority and full support of the chief executive and of government. In some cases, the organization responsible for implementation is separate from the organization or institutional arrangement responsible for oversight. The draft Mongolia ICT Action Plan called for the creation of an ICT Advisory Council and an ICT Development agency to oversee the strategy and its implementation[25].

The strategy and the action plan are dynamic and change with ever changing conditions. The Action Plan and the Strategy are rolling plans with a continuing time horizon of three years and a medium to longer-term horizon that is pre-determined. The Vision, Strategy and Action Plan are also marketing tools used to communicate the intentions of the government and of the supporters of the Strategy to use ICTs for human and national development.

ICTs as tool for socio-economic development – a comparison

This chapter uses the technology achievement index (TAI)[26] to rapidly group and compare countries and their abilities to use technology in general and especially ICTs as tools for development. The TAI is a measure of how well a country is creating and diffusing technology and building a human skill base – issues reflecting capacity to participate in the technological innovations of the network age. Introduced by UNDP, the TAI is intended to help policy-makers define technology strategies. Technical achievement is directly correlated to the TAI, which can reach a maximum of 1.

The TAI measures achievements in four areas: technology creation as measured by the number of patents granted to residents and by receipts of royalties and license fees from abroad, diffusion of recent innovations as measured by the number of Internet hosts per capita, diffusion of old innovations (telephones/capita, electricity consumption/capita) and human

[25] Labelle, R. 2000. Draft plan of action. ICT development in Mongolia over the period 2000-2003. http://www.eurasianet.org/resource/mongolia/links/MnICTPlan.htm prepared for UNDP Mongolia.
[26] UNDP. 2001. Human Development Report 2001. *Making new technologies work for human development*. Oxford University Press. New York. 278 pp.

skills as measured by means years of schooling and the gross tertiary science enrolment ratio.

Countries where the TAI is highest have policies that are based on the belief that ICTs enable economic and social development. However, the ability to generate the benefits that derive from the use of ICTs is itself directly related to the level of economic development in a country. Some of the basic requirements for fully exploiting the knowledge and information economy are related to the GDP of a country or community (See figure below). The calculations used here for calculating the TAI are based on data reported in 2001 and are little out of date. However, the trends remain.

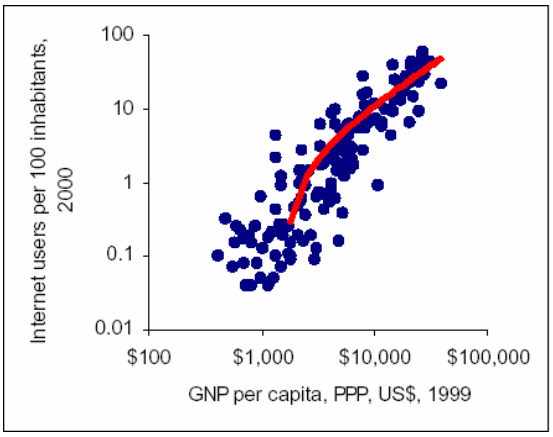

Figure 1. GDP per capita Vs. Internet penetration

GDP per capita, US$, 1999 compared to Internet penetration, 2000. Each dot represents a country. *Source*: ITU World Telecommunication Indicators database[27].

Given these disparities, the digital divide, is really, as a recent meeting of the OECD put it, a reflection of existing disparities between the haves and have-nots.

> *The digital divide is a symptom of existing economic and social divides, which will widen even further if developing countries are not helped to take advantage of ICT in tackling economic and social problems and are denied access to markets that are becoming increasingly ICT-dependent as part of globalisation*[28].

Perspective of High Income Countries

"Leaders[29] *(TAI above 0.5)—topped by Finland, the United States, Sweden and Japan, this group is at the cutting edge of technological innovation. Technological innovation is self-sustaining, and these countries have high achievements in technology creation, diffusion and skills. Coming fifth is the Republic of Korea, and*

[27] ITU. 2002. *World telecommunication development report 2002. Reinventing telecoms*. Geneva. 80 pp + annexes.
[28] OECD. 2001. *Digital Opportunities for Poverty Reduction. Addressing the international digital divide*. OECD Global Forum on Knowledge Economy. JOINT OECD/UN/UNDP/WORLD BANK Global Forum. Exploiting the Digital Opportunities for Poverty Reduction. Paris. OECD.
[29] Taken from: UNDP. 2001. Human Development Report 2001. *Making new technologies work for human development*. Oxford University Press. New York. 278 pp.

tenth is Singapore— two countries that have advanced rapidly in technology in recent decades. This group is set apart from the rest by its higher invention index, with a marked gap between Israel in this group and Spain in the next".

The view of industrialized countries is that ICTs can enable the economy and all sectors of human activity. There is now clear proof that the adoption of ICTs in the 1990s in the USA is directly related to increases in efficiency that have translated into increased rates of economic growth and GDP. The USA has recognized that ICTs are major enablers of the economy and as a sector, major contributors to GNP. Many industrialized countries have developed ambitious plans to connect their citizens (Connecting Canadians strategy in Canada) or deploy ICTs throughout society and the economy. Australia, Great Britain, Singapore, the USA, Korea, Japan and Canada have developed ambitious strategies to provide universal access to the Internet along with universal service, usually to the telephone. These countries are also leaders in providing GOL services to their citizens.

The experience of newly industrialized countries in Asia

The experience of industrialized (Japan) or newly industrialized countries in Asia (Singapore, Korea, Japan and China Taiwan) and the lessons learned so far.

Japan as well as many of the Asian Tigers have predicated their development strategies on a strong and modern educational system and the promotion of science and technology as the basis for development. Singapore, South Korea, China and China Taiwan as well as Japan are examples of this. Singapore, Korea and Japan developed integrated IT master plans early on. In the case of Singapore, the ICT plan was developed between 1980 and 1985, in 1987 for Korea and in the early 1990s for Japan.

Consider Singapore.

Singapore[30]

Singapore's goal is to attain an unrivaled living standard by 2000 and surpass the U.S. standard of living by 2010. The achievements of the state of Singapore as well as other Asian economies in science and technology are impressive. Singapore is clearly a best of breed example of what a recently industrialized country can achieve given vision, determination, investment, hard work and strong leadership.

Singapore has undergone essentially three stages of economic development along with Korea, Malaysia, China, China Taiwan and China Hong Kong.

The first phase is based on providing low-cost labor. The next phase is based on upgrading technology and other infrastructures, and the last phase is based on developing globally competitive businesses. As Singapore lost its competitiveness in

[30] Taken and adapted from: Boulton, R., Kelly, M.J., Yoshida, P.G. 1999. *Information technologies in the development strategies of Asia*. International Technology Research Institute. USA. 68 pp.

low-wage job markets and was forced to move beyond this growth phase, the country focused on building up national technology bases with increasingly sophisticated industrial and domestic research infrastructures and incentives designed to attract global technological leaders and advanced research activities. Realizing it could not attract large scale manufacturing industries to its shores because of the uncompetitive wages of its now better off work force, it instead encouraged off shore manufacturing while retaining the headquarters and R&D facilities of these offshore enterprises in Singapore.

Singapore has undertaken this in an energetic fashion. Its 1991–96 five-year plan budgeted over US$3 billion to upgrade its infrastructure from that of a manufacturing center into that of an innovation hub capable of creating new and better products and services for the region and the world; included was $500 million to promote innovation within companies by covering up to 70 percent of qualifying project costs.

A second thrust developed specialized skills and capabilities, land requirements, and infrastructures to attract international investors. A third thrust was labor skills training for emerging industries and wafer fabrication projects required for assembling microprocessors. This move to upgrade infrastructures is only the beginning of an ongoing process of reorienting traditional economies toward technology, innovativeness, and institutional dynamism. Continuing to improve local standards of living and build long-term economic viability requires sustained technological and business expansion.

A key part of Singapore's plan is to create an electronics industry cluster, including semiconductors, communications, display, and data storage businesses. Singapore's successful electronics development strategy produced revenues of over $45 billion in 1995. The government is offering tax incentives for pioneering investments, incentives for skills training and R&D training, and special reduced taxation for specific industries and technologies. Singapore also has introduced a value added tax system to reduce overall taxation on individuals as well as on corporations.

Singapore's 1991–1996 five-year plan budgeted over $3 billion to support new initiatives and projects. One initiative seeks to upgrade Singapore from a manufacturing center to an innovation hub capable of creating new and better products and services for the region and the world.

In a separate undertaking, Singapore is building a multitechnology, ultramodern telecommunications and information infrastructure. It plans to make its port the most automated in the world. Its Tradenet system now links (in 1999) government agencies by computer networks that can process over 10,000 customs declarations daily. The system can handle complete documentation for trade, government administrations, transportation, banking, and insurance.

What is striking is the high level of commitment in Asian countries to advancing their economies as rapidly as possible through the stages of development in order to achieve global economic leadership and Singapore is no exception. Asian national leaders hold in common a conviction that electronics, information, and communications technologies are key to the future competitiveness of their domestic

economies, of their peoples' standards of living, and of their countries' abilities to fully participate in and contribute to the global economy.

That Singapore is a world class leader in science and technology and research and development can clearly be appreciated from the programme of work of Agency for Science, Technology and Research of the Government of Singapore[31] *which focuses on two main research threads: biomedical sciences and science and engineering, but what also has two main thrusts in education for science and technology called "Students and scholarships" and in industry.*

Science and technology, as for all other endeavours in Singapore is undertaken in a multilingual, multi and cross cultural, multi and cross disciplinary learning, research and entrepreneurial environment, a key feature in attracting the best people and companies from around the world.

Potential leaders

"*Potential leaders (0.35–0.49)—most of these countries have invested in high levels of human skills and have diffused old technologies widely but innovate little. Each tends to rank low in one or two dimensions, such as diffusion of recent innovations or of old inventions. Most countries in this group have skill levels comparable to those in the top group*".[32] In Asia, these countries include China Hong Kong and Malaysia.

Consider the example of Malaysia.

Malaysia[33]

Malaysia's official vision is to become fully developed by the year 2020. Part of the effort to achieve this goal has involved the creation of Government-supported research institutes (GRIs). Malaysia's GRIs include the Standards and Industrial Research Institute of Malaysia and the Malaysian Institute for Microelectronic Systems (MIMOS). MIMOS, started in 1985 within the prime minister's office and now a department of the Ministry of Science, Technology, and the Environment, is Malaysia's national center of excellence in microelectronics and information technology. MIMOS projects are product oriented and focused on boosting the competitive and innovative levels of the domestic electronics industry.

In order to enter and compete in markets for technologically advanced components and products, Asian newly industrialized economies such as Malaysia have relied heavily on cooperation with foreign technology leaders, often by expanding on relationships begun in contract labor arrangements. For a newly industrializing economy, overcoming the financial and technical challenges of expanding into advanced fields may be feasible only with such cooperation. For this reason, Taiwan, Singapore, and Malaysia have been strongly committed to attracting and keeping the

[31] http://www.a-star.edu.sg/astar/index.do
[32] UNDP. 2001. Human Development Report 2001. *Making new technologies work for human development*. Oxford University Press. New York. 278 pp.
[33] Taken and adapted from: Boulton, R., Kelly, M.J., Yoshida, P.G. 1999. *Information technologies in the development strategies of Asia*. International Technology Research Institute. USA. 68 pp.

involvement of leading companies, especially in the 1990s. Once foreign corporations have a stake in local markets, they typically continue to upgrade technologies.

Malaysia is committed to the use of ICTs to achieve its development objectives. Malaysia has a vision to utilize ICT to transform all of Malaysian society into an information society, then to a knowledge society and finally to a values-based knowledge society.

Malaysia plans to invest more than $2 billion over the next decade to become the multimedia hub of Southeast Asia. In August 1995, Prime Minister Mahathir proposed the Multimedia Super Corridor (MSC) project to foster IT industries. MSC stretches south of the capital of Kuala Lumpur to where a new international airport and new federal capital are under construction—a 9-mile by 30-mile zone about the size of Singapore. This corridor will attract a workforce of 150,000.

By creating an advanced information network, Malaysia's government hopes to lure leading R&D companies and software developers from abroad. More than 900 companies have applied to participate in the MSC program. Qualifying firms must be suppliers of multimedia and other information technology products or services and be willing to transfer technology to Malaysia. Non-manual workers such as engineers should account for at least 15 percent of the workforce. Companies that joined the project by the end of 1997 will be exempted from corporate taxes for up to 10 years.

Dynamic adopters

"*Dynamic adopters (TAI between 0.20–0.34)—these countries are dynamic in the use of new technology. Most are developing countries with significantly higher human skills than the fourth group. Included are Brazil, China, India, Indonesia, South Africa and Tunisia, among others. Many of these countries have important high-technology industries and technology hubs, but the diffusion of old inventions is slow and incomplete*"[34]. The Philippines and Sri Lanka also fall in this category.

Many of these countries are very large with important populations, and there is an uneven diffusion of technology in each of these countries. *India, home to a world-class technology hub in Bangalore, ranks at the lower end of the TAI. Why? Because Bangalore is a small enclave in a country where the average adult received only 5.1 years of education, adult illiteracy is 44%, electricity consumption is half that in China and there are just 28 telephones for every 1,000 people*[35].

While India, China and Brazil have technology clusters and/or centres of excellence, each of these countries is also known for their concern about diffusing technology to reach all levels of society, including rural dwellers and the poor. Efforts in India to develop the Simputer as well as other efforts at the local and community level are well documented. China's success in providing near universal access to telephones, whether fixed line of wireless in central

[34] UNDP. 2001. Human Development Report 2001. *Making new technologies work for human development*. Oxford University Press. New York. 278 pp.
[35] UNDP. 2001. Human Development Report 2001. *Making new technologies work for human development*. Oxford University Press. New York. 278 pp.

China is also well known. The commitment of China to e-enable the country is supported at the highest levels and represents a significant national investment in technology and other capabilities. One clear objective is to make China a major participant in the global economy.

China's efforts to connect all major centres with fiber optic cabling is another clear example of the enthusiasm with which ICTs are being rolled out in that country. Experimentation in bringing relevant ICT enabled applications to the people in rural areas is also evidence of the concern that ICTs be relevant to the needs of the rural dwellers.

However, much remains to be done, as many users do not have the ability to take advantage of ICTs or of the information that they facilitate access to. The challenge in India and China as in other countries will be the extent to which appropriate applications can be developed that are useful and usable by the poor. The agricultural information service in Huoshan county that has been documented in this report is an example of such an innovation that can have economic benefits for the farmers that take part in it. If these and other appropriate applications are not developed, then poorer and more marginalized communities will not benefit and the digital divide will remain a major problem limiting human development.

Perspectives from low technology adopters

Marginalized countries with a TAI below 0.20: in these countries, technology diffusion and skill building have a long way to go. Large parts of the population have not benefited from the diffusion of old technology.

In these countries, ICTs - with the exception of radio - are not readily accessible outside of major urban centres. Survival and other development issues are predominant. Environmental conditions may be difficult. There may be civil strife and the country may be in a period of conflict or coming out a period of conflict and undergoing reconstruction. These countries or regions do not have the basic means to take advantage of the information revolution or to fully participate in the information economy. In some cases even basic connectivity is a challenge and only the major centres offer Internet connections. Local and community groups do not have access to reliable power or to telecommunications infrastructure and illiteracy may be an issue along with a lack of awareness and of basic technical and managerial skills. Discrimination against women, language and other issues such as insecurity may also prevail. These countries risk being marginalized and need support in crafting strategies and especially in implementing these strategies and related action plans in order to bootstrap them into the information economy.

Reconstrution efforts in some of these countries have recognized the importance of including plans for developing the national capacity to use ICTs. In the work undertaken with the help of the international community in East Timor, a plan for strengthening the capacity to use ICTs and the

establishment of basic connectivity and networking infrastructures has been an important consideration from the start[36].

Special cases: small island developing states (SIDS) in the South Pacific

Unlike the Caribbean and the SIDS around Africa and the Indian Ocean, the South Pacific SIDS are made up of many small islands and countries covering vast reaches of the Ocean far from major markets and concentrations of human population and poorly serviced by telecommunications infrastructure. In the vast stretches of the South Pacific, there are no more than 2 million people. However, unlike the SIDS islanders around Africa and the Western Indian Ocean, many of these people share common customs and languages. ICT deployment in this SIDS region is focused on overcoming isolation, small population sizes, small markets and the vast distances that separate these countries from each other and from the rest of the world.

Pacific Islanders live in tightly knit island communities where family and close personal contact is an important and everyday fact of life. Life is more rural than in the Caribbean on average. ICTs have been especially useful in facilitating voice communications at low costs between residents of these islands. The Peacesat satellite service has provided for many years locally accessible broadcasting studios that are used for voice communications between groups of people living on the different islands. The PakTok store and forward email messaging service was used for several years in the mid to late 1990s over the existing telephone connections to enable email communication.

Community based networking initiatives designed to increase awareness of ICTs and to encourage their use by local populations and in schools are increasing. A community based approach is essential in the South Pacific and ICT development efforts are predicated on introducing these technologies in the community in public access sites or in schools.

In the PFNet project, a community approach to understanding the needs and circumstances of Solomon Islanders was proven to be essential to the successful introduction of ICTs.

In general, ICTs at the local and community level help people communicate and help contribute to local empowerment and community development. One technology that appears to hold great promise is community radio. Used in conjunction with the other technologies such as the Internet or digital satellite radio, community radio been much appreciated in some Sahelian countries where it contributes to community renewal and job creation for young people. Radio may be an intermediate or middleware technology technology for many users without the capacity to use ICTs or without access to these tools. Used in combination with satellite technologies such as satellite digital radio or fully bi-directional satellite based Internet access services such as Hughes Direct

[36] See: http://www.gov.east-timor.org/old/itpt/it.php as well as: http://www.apdip.net/news/newsart/12122000.pdf

Way or the equivalent, radio can be a suitable enabler for learning about and eventually using the Internet.

ICT as an enabler of development

Several ICT applications enable development activities. Some are presented here grouped by sector or theme. Policy makers need to be aware of these applications for human and economic development so they can develop and plan appropriate policies accordingly. The list is not exhaustive.

ICTs in the fight against poverty

ICTs can help in the fight against poverty. Some of the best examples come from the use of ICTs to help people living of agriculture, whether farming or fishing. Here, ICTs have been used to help fishermen, farmers and herdsmen to locate schools of fish, or manage land, or identify prime grazing areas. In Africa, drought prediction is based on satellite imagery. In Bangladesh, storm early warning systems use ICTs, including radio, to warn fishermen in the Gulf of Bengal. Tools used for environmental management and earth observation are especially helpful here. The data from these earth observation platforms are increasingly integrated into data networks and the Internet and thus readily available to resource users and managers.

ICTs have also contributed to job creation. For women, ICTs have created employment opportunities in back office services and call centres. In Asia especially, where women operate 35% of SMEs, ICTs are considered to have a good potential to help women entrepreneurs and small business holders[37].

ICTs for local and community development

Successful, i.e. sustainable, models of the use of ICTs at the local and community level are limited. According to one study, there are few if any examples of successful donor supported community access or telecentre projects in Africa, Latin America or India[38]. However, some more modest models have had demonstrated success. Senegal's experience with telecentres operated by private sector entrepreneurs has had great success in extending the reach of the national telecommunications operator. In this case, the telecentres are part and parcel of the business plan of the national operator and there is an existing market or demand for these services.

The telecentres are not as exclusively focused on the public good as some of the donor supported initiatives referred to above, but they are a commercial success[39]. In Malanville in northern Benin in Africa, the community access centre was a major investment for all parties concerned, but there was

[37] UNCTAD. 2001. *e-commerce for development report 2002*. UNCTAD. Geneva.
[38] UNDP. 2001. *Information communications technology for development*. Essentials. Synthesis of lessons learned. UNDP Evaluation Office.No. 5, September 2001. 31 pp.
[39] Fuchs, R. 1998. *The little engine that did. Case histories from the global telecentre movement*. IDRC Study / Acacia Initiative. http://www.futureworks.ca/engine/eng_3.htm

marked interest for computer training. Many women took courses that were otherwise unavailable to them so that they could better qualify for job opportunities. Similarly, many of the local professionals and managers, including civil servants, used the course offerings of the multipurpose community telecentre to improve their skills. The main lesson here was that the telecentre served a need that was not being met.

In Niger, community radios have had great success in allowing people to share local and relevant information. In Sri Lanka, the Kothmale community radio[40] accesses the Internet in response to queries and provides farmers and other local residents with information using the spoken work over the airwaves.

In developing community access centres, it is important to base interventions on local needs and circumstances and the participation of local actors. If the proposal is clearly not adapted, then it won't be adopted. If there is no local buy-in, the project will not be sustainable. Policies and plans need to take these issues into consideration. The best way to develop appropriate policies and projects is to undertake extensive surveys of local needs.

China provides a good example of this. China is now experimenting with several models of ICT access at the rural and community level. A pilot project has been undertaken in collaboration with the Ministry of Science and Technology and has been running for nearly 2.5 years. 1200 households are being surveyed to measure impact, consider what improvements may be necessary and feed back the results into policy making at the national level. This model of piloting, testing and surveying does not appear to have been undertaken in a systematic way in many other countries, certainly not at the level proposed in China[41].

ICTs for greater access to information about livelihoods

The agricultural information service in Huoshan county in Anhui province of China that was described previously is a good example of a locally adapted application that met the needs of local users, i.e. local as well as regional and international buyers and sellers of agricultural products and services. Other government or community level applications can help people find information about livelihoods and related opportunities.

Government can have an important role to play through appropriate policies aimed at encouraging various stakeholders; including government departments and ministries, educators, publishers, the private sector, local government and others to develop applications and to make content available that will provide information about livelihoods. Government portals and other e-applications aimed at helping people find employment or information that can help them in their work have been demonstrated to be very useful in

[40] http://www.kothmale.net/

[41] Daniel Wang Dexiang. 2003. Note to the UNDP SURF-IT discussion list under the heading: ICTD Practice Note on rural poverty. First draft. Oct. 8, 2003.

many countries. In some cases, public private partnerships have been struck to help people working in a given sector buy and sell goods and services.

Virtual agricultural marketplaces exist bringing together buyers and sellers and seeking new opportunities for trade in agricultural products and services. Vertical markets have been developed in the US and elsewhere to help bring together suppliers and buyers in given industries. Agri-trader-online is a Chinese online agricultural market place trading in agricultural commodities[42] that has registered over 44 million hits.

In Canada, Strategis[43] is a business and consumer portal developed by Industry Canada with the objective of helping Canadian businesses establish themselves in Canada and secure opportunities and markets abroad. Strategis also tries to provide impartial information for consumers through a "Consumer information gateway"[44]. The site includes databases listing over 50,000 businesses, including aboriginal businesses along with a business capabilities index to promote these capabilities internationally. Strategis has proven to be very popular as a model application of interest to other countries and jurisdictions. Governments need to be aware of these and other applications and examples of best practices in order to learn from these and to seek to apply, adapt and possibly adopt variants more compatible with their own specificities.

ICTs for better government

e-government or electronic government or government online are various expressions of e-business in government and the public sector. What are the development objectives of e-government? These are to help government to better serve the people and help the country achieve its full potential. One objective is the modernization of the government and its transformation into a service oriented public enterprise that works for the public good. These and related development benefits and outcomes are captured in the box below. Some e-government applications are described below.

Public sector transformation into an open, accessible, informative, helpful and user-friendly service for the people is what the planned and stepwise introduction and use of ICTs and related applications can lead to. This means going beyond the usual office productivity applications. Collaborative software combined with awareness promotion, training and mentoring as well as a strong commitment to openness and transparency are the cornerstones of e-government. Government leaders must show the way and encourage this transformation.

The full benefits of e-government as an instrument of good governance will not come to be as a result of using ICTs only for office productivity applications. Policy makers and planners will have to assess the state of

[42] Globle Agricultural Trader Online. http://www.agri-trader.com/english/index.asp
[43] http://strategis.ic.gc.ca/engdoc/main.html
[44] http://consumerinformation.ca/cgi-bin/main.cgi?Language=E

government readiness for transformation of the government into a service based and client focused enterprise for the public good. An e-government policy and strategy will be useful, along with an action plan to implement the transformation of government into an e-enabled public enterprise. There is a tendency in planning for e-government to assume that the introduction of ICTs will lead automatically to changes in behaviour. This is not the case. A concerted effort is needed to influence the attitude and change the behaviour of government employees as well as the public, which will interact with them.

Box 2. E-government - benefits and outcomes

Key benefits

- More accessible government information and services
- Faster, smoother transactions with government agencies
- Increased access to government decision makers and to parliamentarians
- More local (distributed) access – greater ubiquity
- Increased participation in government
- Increased efficiency in government operations
- Enhanced opportunities for smart partnerships with civil society and the private sector

Principal outcomes

- Service expectations of the public increase and increasingly satisfied
- Increase in the efficiency and effectiveness of government
- Greater access to and availability of public information: less need to travel and queue
- Automation of most government services and transactions
- Increased participation in government
- Increased public satisfaction with government
- Increased trust in government
- Decentralization and strengthening of local government
- A stronger national identify

Box 3. Some key e-government applications for people

E-government applications for people

- Community based access centres or telecentres: provide access to government information. In some countries, the aim is to provide public access within walking distance for everyone
- Web portals in local and other languages (English, Chinese, etc.)
  - Brochure portals: static information, read only
  - Interactive service portals (interactive forms: applications, renewals, registrations, etc.)
  - Knowledge portals: health network, business & investment portal + interactive and ancillary services – email, mailing lists, data and databases, value added services
  - Transactional portals (online tax filing and receipt issuance, online banking applications, online public procurement services, etc.)
- Public kiosks in government offices and public spaces such as clinics
- Fully interactive and transactional public procurement portals linked to the major international development portals (UN Business, World Bank and other international financial institutions as well as other national procurement portals in a given trading block for example and beyond - possibly as a result of free trade agreements)
- Smart communities: municipalities and other communities that have mainstreamed ICTs and especially PCs and IP networks for local and community development
  - Community resources and services, including local shopping opportunities, available online to encourage local shopping and spending. Could include online market places or shopping malls
  - Creation of a community database where all community based events are logged and available. Could include a community calendar
  - A people database and calendar of life events that tracks important dates such as date of renewal of permits, licenses, passports and other documents and authorizations, etc. for users.

ICTs for crisis prevention and recovery

The development objectives here are to improve the quality of life by reducing the risk associated with natural phenomena, to reduce the likelihood of natural disasters and to help manage disasters and mitigate their impact when they do happen. ICTs for remote sensing and earth observation as well as analytical applications such as geographic information systems (GIS) as well as appropriate communications infrastructure can have an important role to play here. Many early warning systems exist, some supported through international and/or regional entities or collaboration. Policy makers need to be aware of these possibilities and the opportunities that they present when developing national ICT policies and strategies.

ICTs for energy and the environment

The use of GIS and related applications has been described above. ICTs in energy management are of course useful for control and planning. This is a highly specialized area that goes beyond the scope of this discussion. However, the use of ICTs in environmental management is especially important to policy makers and to human development in general. Computers help analyze, aggregate, interpret and communicate vast amounts of data that is collected by a variety of earth observation and measurement technologies and sources. A global network of environmental monitoring and collaboration exists in the form of meteorological and environmental services. Many countries may not have the resources, human and technological, to fully exploit these tools and use the available information for environmental management.

Policy makers need to be made aware of the importance of these tools. However, the development of world-class environmental information services may be beyond the reach of many countries, especially the smaller countries in the poorer parts of the world. Policy makers need to be aware of the technologies that are used and the networks that collaborate so that they support the networks and ensure that the country or jurisdiction has the capacity to fully exploit this information for national development planning.

ICTs for health and the fight against disease and HIV/AIDS

e-business applications bring efficiency and productivity advantages to the management and delivery of health and medical services. Some key applications can have an important impact on health delivery. Telemedicine has been considered of great use, but depends on access to broadband as well as modern medical or hospital services, which are not always available in developing countries and especially in rural areas.

Policy makers need to be aware of best practices around the world. In China, access to information about health has been demonstrated to be a priority in some of the poorer provinces. As a result of the recent de-facto privatization of health services in that country, people can no longer get free advice and can lo longer visit the doctor for free. Access to information about public health issues is a major concern. Policy makers need to be aware of this need and of ways in which the Internet and community health centres as well as community access centres along with radio and television, can meet this need.

Some countries have developed public private partnerships between government and the heath care / pharmaceutical industries and medical associations to help bring this about in the form of health portals dedicated to helping citizens become more informed in matters related to public health.

The rapid increase in the use of wireless devices presents some opportunities to deliver health messages to patients in appropriate languages and dialects. Short message service (SMS) applications have been developed to remind

patients to take their medicine. For chronic diseases such as tuberculosis and AIDS, these applications have proven to be very effective[45]. Policy makers need also to be aware of these specialized applications for the delivery of health services.

ICT as an industry

Policies to encourage the use of ICTs – promoting demand for goods and services

The ICT industry is either service based or focused on hardware. Some companies are involved in both aspects of the business. National ICT policy can contribute to the establishment, development and growth of ICT businesses by providing incentives and support to this sector as well as incentives to buy the products and services produced or offered by the ICT industry. Incentives may take the form of encouraging foreign partnerships or joint ventures, including foreign direct investment (FDI) as well as empowering local businesses. Encouragement can include tax incentives, the reduction or removal of taxes on the importation of computer hardware and peripherals on the assumption that the resultant economic benefits will far outweigh the loss of revenue. Other incentives can include encouraging access to credit, lowering taxation rates or providing tax holidays, etc. These incentives encourage the creation of a demand and a local market for ICT goods and services.

Beyond the use of classical fiscal incentives, policies that actively strengthen the capacity of local businesses are also needed. These policies should target those local firms – SMMEs really - that have the potential to become "flyers", as Duncombe and Heeks have put it, otherwise the effort may get dispersed.

One aspect of this may call for the creation of business incubators to help build local capacity. Business incubators strengthen the entrepreneurial base of a country or jurisdiction[46]. Governments may support business incubators as part of their policies to promote economic development.

There are two cases that can be considered here for building the capacity of businesses: building the capacity of any business to use ICTs as part of its operations. This would include building capacity to use productivity and efficiency applications as well as collaborative software and other specialized business applications necessary for e-commerce: specialized Web and Internet based applications, electronic data interchange (EDI) and electronic funds transfer (EFT) among others. For export-oriented firms, the ability to use e-enabled customs trading services, if available, is an important component of SMME capacity building.

Government policies to strengthen and support the competitive capacity of local firms should include support for e-commerce trading and customs

[45] Bridges.org. 2003. *Case study: The Compliance Service uses SMS technology for TB treatment*. ICT-enabled development case studies series: Africa. IICD and Bridges.org. http://www.bridges.org/iicd_casestudies/compliance/index.html

[46] UNIDO. 2003. Business incubators. The concept. See: http://www.unido.org/en/doc/3736

clearing applications such as UNCTAD's AsyCUDA e-trading system[47]. The latter have been demonstrated to reduce rent seeking behaviour and graft, as well as helping countries collect tax. The advantages are significant and represent significant amounts of income for the government.

The second case involves support for the creation and/or strengthening of the national or local ICT industry. This may require some of the interventions already mentioned above, as well as an industrial development policy focused on enabling the ICT sector. Policies that make it easy or firms in the ICT sector to operate may need to be developed, in a fashion consistent with established international and regional trade rules (See chapter below).

Policies to support the ICT industry

For larger players, especially international firms such as the international banks, policies that encourage and facilitate the use of e-commerce tools and applications will be important. Policies that recognize electronic signatures and contracts and that establish the basis for secure transactions over the Internet and using wireless devices as well as policies that facilitate the use of EDI and EFT transactions are important.

Smaller and usually local firms will need support to develop the capacity to benefit from e-commerce. These policies aim to support business entrepreneurs in the ICT industry in their efforts to establish firms able to compete locally and possibly beyond.

For firms in the ICT industry, business incubators will be useful in building the capacity to use the generic e-business applications mentioned above. More important, they can also help ICT firms establish themselves by providing support for business planning, access to networks, expertise and venture capital and associated coaching and mentoring, especially if this comes from angel investors with the requisite experience and technical know-how to help the firms establish themselves.

ICT policies should aim to support entrepreneurship in general and the establishment of entrepreneurs in the ICT sector especially. Some countries have established technology business incubators to help entrepreneurs establishing themselves in these sectors.

Policies for the ICT industry aim to strengthen the competitive and comparative advantage of hardware and ICT services providers locally, regionally and internationally. Some countries have policies favouring local companies over foreign owned companies. Such policies may be difficult to justify under current trading regimes and with the WTO because of their discriminatory nature. Efforts to strengthen the capacity of local businesses and especially SMMEs are easier to justify. Many countries have policies to

[47] Asycuda: a computerized customs management system developed by UNCTAD. See http://www.asycuda.org/aboutas.asp

support and promote SMMEs because of their potential to create employment at the local level.

International business opportunities

Policy makers need to encourage local businesses in the international market place. The global economy is information driven and the ability of local firms to compete will be tied to their ability to use appropriate information technologies and management practices. Adherence to the WTO agreements will be important in helping ICT firms establish a foothold in foreign markets. Policymaking should be aware of these requirements and tendencies.

One of the biggest opportunities for ICT businesses is offshore information technology outsourcing. Ireland and India are the established leaders in this race with several countries trying to establish their presence in this market. However gaining a foothold in this market does not come easily. In India, revenues have been estimated at USD 7.7 billion; however, Indian firms also spent billions in order to establish the business relationships – relationships based on trust - in Europe and North America, upon which outsourcing relies.

Many countries have shown great interest in participating in this market. Policies that encourage this outsourcing need to be considered, given the potential benefits. Market assessments need to be undertaken to properly assess the opportunities, costs and risks associated with these endeavours.

Approach to ICT policy formulation and e-strategy development

The starting point in ICT policy formulation is a review of existing vision statements, policies and legislation as well as proposed policies or policy directions. This includes developing an understanding of national development policies and plans, including national Poverty Reduction Strategies. As already mentioned, ICT policy making has the greatest chance of being successful when undertaken in a pro-development way, as the Digital Opportunities Initiative report has shown.

The next step in to consult extensively with key development stakeholders, tarting with government decision makers and policy makers. Parliamentarians may also need o be approached.

1. Strategic Problem List and Tree (to come)

   National development and poverty reduction goals

   Assets and advantages

   Constraints and liabilities

   Country specific considerations

   Options

   Priorities

   Approach – criteria for selection

Recommendations

Timelines

Project proposals and resource requirements

Part I. ICT Policy Development

Why we need national ICT Policies?

National ICT policies help guide the country or jurisdiction in its use of these tools and to help secure the benefits of the information economy for all. ICT policies need to be planned in order to marry the opportunities and needs of people with the possibilities that are available through the use of ICTs. Policies are national decisions that need to be taken based on the best information and intelligence available and in consultation with stakeholders to help secure beneficial and realistic outcomes from the considered use of ICTs for all citizens.

National ICT policy making can consider a variety of issues. Some of the most relevant and important are described below.

Information access policies

Policies regarding access to information can be contentious. In many traditional societies, information flows are privileged and they are restricted if not controlled. The right to information proceeds on a need to know basis, and elders and other traditional decision makers are gatekeepers, controlling access to information and to decision-making. In many governments, access to information is severely restricted. The colonial legacy has also left its mark. Government officials, ostensibly acting for the public good, have replaced elders and the colonial governments with secrecy rules that have been passed down to them. The rise of the information economy and of the knowledge society challenges and undermines this state of affairs although there is resistance to change.

In the early 1990s at a time when the Internet was just becoming established internationally, UNDP's flagship SDNP endeavour – a project designed to accelerate the introduction of the Internet for development that was being considered in about 80 countries at one time or another - was resisted in more than one country on the grounds that the Internet was little more than a tool of the West to spy on foreign entities and that anyway, the Internet was not compatible with the values of many societies. Today, those very same societies are at the fore of Internet development, innovation and diffusion.

ICT policymaking needs to be concerned about information policies, but not overly so. The business case for ICTs is compelling and most countries realize this. "*Market reforms, the influx of foreign investments and*

globalization in general have had a liberalizing impact on information access" in South East Asia[48] and elsewhere.

In many countries, including most developing countries, policies affecting the flow of information are a secondary consideration in the rolling out of ICTs. Singapore ranks second in the economic freedom of the world index for 2003[49] but access to information is severely controlled there[50]. There is concern that China as well as many other countries restricts access to certain types of information accessible via the Internet. Some view this as censorship and a limit of access to information and therefore on the ability of people to choose freely for themselves.

However, if such were really the case, then why would China undertake one of the most ambitious transformations of society anywhere through its aggressive rollout of ICT infrastructure and access opportunities for its citizens, including the rural poor? The answer is clear: the urge to modernize and compete internationally and is so doing, to raise the quality of people's lives. The thinking here appears to be that once these technologies have been mastered, everyone will gain because of the economic benefits that will accrue. The outcome remains to be seen as it is unclear how the average person will benefit. There are several issues related to the operation of markets and regulatory authorities that still constitute a threat to the level playing field. One of the most important is the question of transparency, which itself is an information policy issue.

Perhaps the first step in moving forward is to enshrine in national laws the tenets of the UN Declaration on Human Rights dealing with the universal right of all 'to seek, receive and impart information …', although these do not deal with requirements for transparency[51].

Box 4. What information should be in the public domain[52]

> Fundamentally, all information belongs to the public and it should be in the public domain unless compelling reasons exist to withhold it. The ideal approach is seen in Brazil: to create a legal requirement that official information must be made available to anyone who seeks it unless there is good reason to withhold it.

Related policies include[53]: freedom of expression and the right to communicate. Policies to enshrine these should also be considered along with

[48] Coronel, S. 2001. The right to know: access to information in Southeast Asia. The Philippine Center for Investigative Journalism (PCIJ). Manila.
[49] Fraser Institute. 2003. Economic freedom of the World Index 2003. http://www.freetheworld.com/release.html
[50] Coronel, S. 2001. The right to know: access to information in Southeast Asia. The Philippine Center for Investigative Journalism (PCIJ). Manila.
[51] Pope, J. 2002. *Access to information: whose right and whose information?* Global Corruption Report 2003. Transparency International. pp 8-23.
[52] Pope, J. 2002. Idem.

the legal and regulatory frameworks to ensure that these policies and the rights that they enshrine are respected.

According to Freedominfo.org, over 50 countries worldwide have adopted freedom of access to information laws[54]. In East and South Asia, China, Mongolia, Nepal, Bhutan, Vietnam, Cambodia, Laos, Myanmar, North Korea and Malaysia have no freedom of access to information laws; India, Pakistan, South Korea and Thailand have laws and in the remaining countries, approval of the laws is pending.

The implication of information access policies for management of public records

Policies governing freedom of access to information are the cornerstone of e-government. Access to public information and services is partly what e-government is all about. One of the requirements of open access to information policies is the need to organize and structure government records. One institution, the International Records Management Trust (IRMT) has identified the need to improve the management of public records in order to ensure that the public record is maintained. Accessible, complete and well-managed public records are the basis for evidence-based decision-making and a cornerstone of the rule of law[55], and a foundation of good governance. Efforts to ensure this should need to be a part of ICT development efforts, especially those aimed at building capacity for e-government.

Telecom policies and regulations

Telecommunications infrastructure and services provide the connectivity upon which the information economy is based. The liberalization of telecommunications markets as a result of the WTO agreements has meant increased competition among telecommunications services providers as well as increased access to telecommunications infrastructure in and between WTO signatory countries. The increasing number of interconnections and the extension of the global Internet as more countries and markets come online and as more connections are established between these countries is a key feature of telecommunications liberalization and globalization.

The following are some of the issues that may need to be dealt with in developing national telecommunications policies.

- Reform and regulation of the telecommunications sector. Global trends and local implications: World Trade Organization (WTO) Telecommunications policies and reform: what they mean: the General

[53] See: p. 16. James, T. Editor. 2001. An information policy handbook for Southern Africa. A knowledge base for decision makers. IDRC. Ottawa. 227 pp. www.dbsa.org/publications.ictpolsa/ and www.apc.org/books/ictpolsa/

[54] Banisar, D. 2003. The www.freedominfo.org global survey. Freedom of information and access to government record laws around the world. 90 pp. http://www.freedominfo.org/

[55] International Records Management Trust. 2003. Evidence based governance in the electronic age. http://www.irmt.org/evidence/wbabout.html

Agreement on Trade in Services (GATS) and the WTO Agreement on Basic Telecommunications (ABT).

- The importance and need for market liberalization and for putting in place policies that encourage competition in the telecoms marketplace
- The creation of an independent regulator
- Strengthening and supporting the regulator to adequately deal with sometimes very technical or business oriented issues (ensuring that there is a level playing field in the ICT marketplace, ensuring competitiveness, ensuring and overseeing peering arrangements between service providers, frequency checking, etc.)
- Regional collaboration on telecommunications issues: sharing the burden and the cost – advantages and disadvantages.

A competent telecommunications operator is essential for delivering the benefits of the information economy and the infrastructure to go with it. However, many telecommunications operators and especially those in smaller jurisdictions cannot cope with the management and technical requirements of new and ever changing ICTs. Managing IP networks and services requires high-level technical skills that some operators cannot cope with. To help overcome this situation, policies that encourage market liberalization and that are pro-competition have been enacted in several jurisdictions. With liberalization and more competition, it can be hoped that investors with the requisite technical and business skills will participate in the local telecommunications market and strengthen the level and quality of service. The evidence so far has been positive[56].

China has established a very aggressive competition policy pitting former state enterprises, including many former state sponsored monopolies against each other in the delivery of ICT infrastructure and services. Large state owned firms have been broken up and the entities that have been created forced to compete with one another. China Telecom, China Unicom, the railways, the television and other former state owned entities are competing in a no holds barred fight to gain a foothold in this rapidly growing – indeed the largest - ICT marketplace.

An independent regulator is considered essential to promote infrastructure development and to ensure that the telecommunications market operates on a level playing field. These conditions are considered helpful if not essential in ensuring the right conditions for facilitating access to telecommunications infrastructure and ICTs in general prevail at a rate and pace that is consistent with the capacity of the local market.

The key issues here are the independence, speed of action and reaction as well as capacity of the telecommunications regulator. If the regulator cannot act quickly and conclusively, the sector may flounder and languish. When developments take place at Internet speed, the regulator can quickly become a bottleneck and not an enabler. Because regulatory affairs require such a

[56] ITU. 2002. World telecommunication development report 2002. Reinventing telecoms. ITU, Geneva. 188 pp.

breadth of expertise to cover the business and technological aspects of the telecommunications business and market, the demands that are placed on national regulators are invariably extreme.

Smaller and poorer jurisdictions cannot readily cope and neither can larger ones. There is a need to strengthen the capacity of these countries to regulate. One way of doing this is to strengthen agencies such as the International Telecommunications Union (ITU) and the WTO to help countries that are confronted by these and related difficulties. Another way may be to encourage regional or shared approaches; although the evidence is not encouraging that these mechanisms work. Experience in Southern Africa has shown that this approach is not easy to realize. National policy makers need to be concerned about these issues.

ITU's World telecommunications development report 2002 summarizes some of these issues as follows:

- Privatization without competition is good, but privatization with competition is much better.
- Introducing private sector players is good, but allowing them the freedom to compete is better.
- Creating regulators is good, but giving them adequate powers and independence is better.
- Creating a duopoly is good, but allowing open competition is better.
- Introducing competition is good, but introducing it at an early stage of market development is better.

Frequency and radio regulations

Radio spectrum frequencies carry wireless communications. Radio frequencies are finite resources, which need to be assigned and regulated. Countries need to develop policies regulating the assignment and use of these frequencies. Licensing regimes need to be developed. Some frequencies are reserved for public use, such as use for emergency communications. In some countries, certain frequencies have been reserved for military communications. Regulating frequencies requires not only the development of appropriate policies. There is also a need to have the technical capacity to understand the use of these frequencies for data communications and to adjudicate disputes, which can arise over issues such as interference between available frequencies and other communication media such as radio and television.

The ITU, the WTO and other international and bilateral agencies can assist countries develop appropriate policies and operational procedures for regulating frequency use in respect of the newer technologies that are transforming wireless devices into devices capable of accessing the Internet. Given convergence and the growing importance of wireless devices and of the mobile Internet, regulations governing the use of the wireless spectrum have an important role to play in enabling a country's use of ICTs for

competitive advantage. The difficulty for regulators and countries with limited resources is the highly technical nature of these applications.

National ICT development policies

National ICT infrastructure development policies need to be sustainable and for this, these policies need to be linked to the marketplace. Many countries have developed very ambitious plans for ICT rollout. However, many of these plans are divorced from the realities for the national and even regional marketplaces and are far too ambitious as a result and fail. A good example of this is the tendency found in some countries and jurisdictions to develop "techno parks" to attract ICT companies and especially the large players.

National ICT development plans need to be based on sound market studies and user needs assessments. Government interventions need to be based on solid market studies and need to have the support of the business community to succeed. E-readiness assessments alone will not do. A business planning approach must be taken that will help understand the needs of the market place, what the market will bear and therefore what products and services will best meet those needs in a sustainable and commercially viable way. Remarkably, many ICT development strategies are not sufficiently anchored in the realities of the marketplace to succeed. In many countries, the rates fixes by national telecommunications operators are not based on market studies but rather on the analysis of rates in other countries and jurisdictions.

This needs to change and policies need to reflect the marketplace in which they will operate. Some countries have focused their development strategies on the concept of becoming a services hub of one sort or another. The international financial services centre hub is a model that has gained in popularity in a few countries (Ireland especially). In developing plans that are regional or international in nature, it will be important to also study the market from a regional or international perspective, as well as nationally.

E-commerce policies and regulations

Catherine Mann and her colleagues, in their primer on global electronic commerce state that "*electronic commerce needs standards, regulations, and laws to create an environment of certainty, trust, and security … Examples include technical communications standards; the legality of electronic signatures and certifications; encryption and interconnectivity standards; and disclosure, privacy and content regulations*"[57].

e-commerce increasingly underpins business transactions and is a major component of the global information economy. According to optimistic predictions, e-commerce would represent about 18 per cent of worldwide

[57] Mann, C., Eckert, S.E. and Knight, S.C. 2000. Global electronic commerce. A policy primer. Institute for International Economics. Washington. 213 pp.

business-to-business and retail transactions in 2006[58]. In developing and transition economies, it is B2C (business to consumer) e-commerce that predominates, although B2B is expected to become more important in the medium to longer term.

e-commerce and B2C applications are not as important in the developing world as they are in the industrialized world. This is partly due to the fact that the infrastructure to support the transport of hard or durable goods purchased using B2C solutions as well as the online payment systems are not always available in less industrialized countries. Ready access to credit, the lack of payment systems and smaller markets are other factors limiting the diffusion of B2C e-commerce, although in some of the larger countries such as China and India, this is changing with the growth of the middle class. The introduction of other forms of payment based on wireless devices and other electronic payment systems that are better adapted to the situation of consumers in the developing world is also contributing to the diffusion of e-commerce applications as well as the development of m-commerce (mobile commerce) based on the use of portable wireless devices such as mobile phones and PDAs.

Policies are required to accelerate the transformation of business practices and the adoption of these technologies and procedures to facilitate participation in the information economy. Invariably this will require awareness promotion, capacity building and training, as well as handholding and incentives similar to the already discussed in the section on supporting the capacity of SMMEs to use and apply ICTs.

In order to assist countries with the process of developing legislation to enable the transition to e-commerce, the United Nations Commission on International Trade Law (UNCITRAL) has developed model laws for e-commerce (http://www.uncitral.org/en-index.htm).

According to UNCTAD, Asia and the Pacific lead in the adoption of e-commerce in the developing world[59]. Part of the reason for this is that businesses in this region are more integrated into global supply chains and trade flows. Their trading partners in other parts of the world demand their integration through the use of e-commerce applications, and this may include EDI and EFT applications. Another factor encouraging the spread of e-commerce is the diffusion of broadband access technologies in Asia. The three countries with the highest broadband penetration in the world – South Korea, Hong Kong and the province of Taiwan in China – are located in Asia. Governments have also been very supportive of the development of the Internet and of e-commerce.

Because of the global reach of the Internet and related e-commerce applications, there is also a need to put in place policies and laws that permit interoperability in applications and technologies between jurisdictions and

[58] UNCTAD. 2002. e-commerce for development report 2002. UNCTAD. Geneva.
[59] UNCTAD. 2002. e-commerce for development report 2002. UNCTAD, Geneva. 282 pp.

countries and compatible with the international policy environment. Standards need to be agreed and mechanisms in place to permit international collaboration on these and related issues. Fortunately, bodies exist for this purpose. However, some countries need assistance to take advantage of these and related bodies and instruments to help them gain beneficial advantage from e-commerce applications.

E-Government policies and regulations

e-government promises to transform the business of government. The following are some of the policies and policy related issues that need to be considered in transforming and modernizing the government so that it is more responsible, user-frienly, transparent and accessible. Many of these policies and issues are discussed elsewhere in this report.

Some key policies include:

Policies that promote freedom of access to information, especially public and government information, are considered by some people as a cornerstone of e-government. However, not all countries have adopted freedom of access to information laws, including many of the strongest e-government performers in Asia.

One policy is the requirement that government be a service based enterprise for the public good and as such be required to be user-friendly in the dealings of government staff with the public. In this policy, the intention is that government focus on the public as the client. This is a cornerstone of public sector transformations around the world.

Another policy closely allied with the previous one calls for the modernization of the government through the introduction of computers and networks.

In many countries and especially in developing countries, the value proposition driving e-government is based on: easing access by reducing queues and reducing travel to government offices and in general by increasing the ease and efficiency of transactions with the government and especially with government employees. Policies that ensure that this happens will have public support.

Policies will be necessary to ensure that rural dwellers can also take advantage of the benefits of e-government. For this, local and community based access technologies and applications will need to be considered. Online kiosks in government offices or in community access centres will also be needed and a national e-government delivery plan will need to be developed.

ICT industry policies

As already mentioned, there will be a need for the usual business and investment incentives to encourage the development of the ICT industry.

Universal accessibility policies

Universal access is a core policy that promises access to basic telecommunications services across the country. Commitment to universal access is the cornerstone of efforts to reach out to include all in the information economy and is a first step in bridging the digital divide. A funding mechanism to meet the cost of universal access has to be discussed and negotiated by the telecoms regulator and/or by the government department of ministry that is responsible for this. Operators are expected to contribute to the cost of rolling out access as part of their obligations under the licensing agreements they have signed with the local regulatory authority or the government.

In some countries, the universal access policy will be achieved in part by rolling out community telecentres. This is the case in South Africa[60] where it is estimated that to meet universal access obligations, about 5,000 community access centres or services will be required for all of South Africa[61]. Because wireless devices such as mobile phones have had such success, it is likely that wireless telephones and other access devices will be the primary way of meeting universal access obligations.

In industrialized countries, the objective is universal service – that is access to telephone services in every household because those without access to telephone services are considered to be disadvantaged[62].

Community based access centres are likely to be important in many ways in bridging the digital and in helping to ensure that all benefit from the growth of he information economy.

The need for stakeholder collaboration in policy development

ICT policies and strategies, like many other society initiatives, require participation and support from all sectors of the economy and all levels of society throughout the country in order to have the greatest chance to succeed.

Public consultations are the norm in many countries, especially at the formal launch of an event. Often times though, these consultations are not undertaken on an ongoing basis and in many cases, there is no institutional or

[60] CommUnity. 2000. *Universal access ICT projects in South Africa*. http://www.communitysa.org.za/projrev.htm

[61] ITU. 2002. *Multipurpose community telecentres – Connecting people from Timbuktu to Kabul. Initiatives in South Africa*. http://www.itu.int/itunews/issue/2002/05/southafrica.html

[62] Bridges.Org. 2001. *Spanning the digital divide. Understanding and tackling the issues*. Durbanville, South Africa. 151 pp.

legal mechanism that builds consultation into the process. Consultations are needed to ensure buy-in and support, and to limit resistance from various groups.

Consultation can take many forms. There are the very visible consultations that take place at public events. There are also the consultations that take place during the development of the policies and strategies. In order to ensure the greatest amount of participation possible, a stakeholder participation plan may be helpful along with a regular and institutionalized process for building in consultation at all stages of policy and strategy development and implementation.

Models of stakeholder collaboration

Some ideas for stakeholder collaboration and project implementation have been discussed above. However, there are no fixed models for stakeholder collaboration, just experiences of what works best in a given jurisdiction. Stakeholder consultation models are site specific and should be consistent with local practices while seeking to go into some depth with stakeholders in order to get to know the issues.

Some examples include:

Round table meetings, which are more or less public gatherings of representative's of involved stakeholder groups. Round table meetings discuss issues related to implementation and usually call for many participants to come forward. The consultations can yield useful insights but require much energy to organize and manage, depending on the number of participants. Round table meetings should be organized on a regular basis and involve a core of interested and affected stakeholders.
Focus group discussions: these involve small groups of people who are selected because they are representative of a given target group. Focus groups can be very helpful in determining if projects are on track or not. Because participants may not be specialists, focus group meetings can be helpful in trying to understand how the public may react to certain ideas or policies. In some cases, focus groups are relatively homogeneous, for example are made up of young entrepreneurs, in order to get a preliminary understanding of a particular group or market so that this information can feedback into the planning process.

The participation of representatives of key stakeholders in the governance of the ICT strategy and action plan is another example. This could include participation on the board of trustees as mentioned previously, and/or during the implementation as part of the implementation team. The former is probably the better solution.

Online consultation and exchanges are another example, but are not that useful in many countries where online access is not readily available.

Parameters of ICT Policy development (- the 5C's)

The following parameters of ICT policy development are some of those that have to be dealt with during ICT policy making and strategizing.

Connectivity

- Ensuring the greatest access to ICTs as possible, but ensuring that rollout is demand driven as well as equitable and consistent with the needs to ensure universal access. The state and/or privatized telecommunications operators undertake a market survey to decide on the extent of their investments in connectivity
- Privacy and confidentiality policies, regulations and laws need to be put in place, recognized by the law and respected. It is important to respect the privacy of people and organizations while ensuring connectivity. Perhaps it is not a good idea to centralize all databases with personal information in one government facility
- The question of universal access will have to be considered and a model of universal access discussed. Universal access provisions are very difficult to guarantee and usually are laid out over long time scales because of the need to pay for the investment and the limited capacities of operators and governments to do so all at once
- The role of community or public access: cybercafes and cybercentres, community access centers and related (telecentres). In many countries, community access centres or their equivalent are the cornerstone of e-government offerings as well as an important outlet for those wishing to access government services.
- Special considerations for the private sector: techno parks and intelligent buildings may be useul applications and investments if they are backup by comprehensive business and marketing plans and srudies. In the case of intelligent buildings, the building code may need to be modified accordingly). Incentives to allow the private sector to connect and to compete are also important
- Peering arrangements: ensuring that the telecommunications service providers (GSM operators, ISPs, paging companies and fixed line operators) can interconnect their networks locally.

Community

- Promoting the use of ICTs for local and community development. This is especially important to help bridge the digital divide and to provide local access to the Internet and other government applications and services
- Policies to encourage community participation and participation at all levels. Non discriminatory clauses may be required
- Policies to encourage early adoption of computers and releated technologies and skills for learning and doing this in association with community resources such as schools

- Smart City or Smart Community ideas: local and community or municipality based policies to encourage the development of an e-enabled community. Incentives to encourage this may be required, as well as best practices examples of what is meant here
- The research and learning community: focusing on policies that will encourage the deployment and use of ICTs in research, development and learning. Special applications can include distance learning and ICT assisted learning activities in general. The research and development community can benefit from the use of ICTs to access research and grant making opportunities
- The health community: promoting the use of ICTs by the medical profession and in hospitals and medical centers, as well as in community and other public access sites and facilities.

Capacity

- Developing policies that will encourage learning
- Providing incentives and tax breaks for learning and using ICTs. For example, students, educators and researchers can import and purchase PCs free of tax
- Encouraging ICT manufacturers and others to establish ICT technical training facilities locally. The Cisco Academy endeavour is one example and there are others.

Collaboration

- Ensure that ICT policy development takes place in an open and collaborative fashion, consistent with the principles of human development
- Peering: ensuring that networks interconnect locally, where the costs are lowest
- Strengthen the regulator to make sure that it can intervene to promote a level playing field in the market place and to recognize and limit uncompetitive and/or monopolistic behaviour

Cash

- ICT policies should result in the development of a realistic and doable ICT Action Plan that includes several proposals for bankable projects that can be submitted to and considered by a variety of potential investors, donors and supporters
- Developing policies that will encourage access to credit for the purchase of PCs and related technologies
- Encourage investment through incentives
- It is important to encourage public-private partnerships that will bring much needed expertise, management and financing to.

The importance of related policies

- Policies related to the treatment of investors and especially foreign investors and companies. Make sure the rule of law applies in general and to foreign entities especially, and that is equitable in perception and in fact
- Policies governing the financial and banking sectors
- Information policies that were mentioned previously (these in fact should be considered as part of an ICT strategy)
- Intellectual property rights
- Local and regional entities and trade groups. Regional telecommunications regulatory agencies as a way of sharing the cost of developing appropriate policies and of regulating the sector

Sectoral policies

- Banking and financial sector: without a viable and modern banking sector, able to take advantage of the latest technologies and management practices, the private sector upon which ICT infrastructure depends will suffer.
- Trade and economic development: ensuring that this sector is supported by appropriate policies that strengthen the competitive position of the country or jurisdiction.
- Consumer protection policies to ensure that users of the Internet for example are not exposed to scams, hacking and fraud

ICT Policy resources

There are several resources available to help policy makers and others understand the issues and learn from experiences from around the world. Some of the most relevant and important are listed below. This is not an exhaustive list.

- ITU, UNCTAD, WTO, International Trade Centre, World Bank, international financial institutions (IF Is)

  The ITU publishes several monographs in its various series, including the Internet reports series. Several of these publicatios are quoted here. UNCTAD publishes he e-commerce for development reports and UNDP publishes the global human development report annually, as well as biannual national Human Development Reports reports. ITU and the WTO International Trade Centre are prepared to assist countries develop appropriate telecommunications policies and strategies as well as advise countries of issues such as tariff reform, privatization of the telecommunications operator, etc.

- International community: national policy resources and experiences available over the Internet or in some cases by asking countries directly.
- UNCITRAL: see above
- Regional trade groups or regional collaboration bodies sometimes deal with ICT policy development and related issues[63]

Institutional Frameworks

- The ICT policy development chain: what are the institutional relationships between government, privatized operators, the regulatory agency, the line ministries such as communications, etc. These have to be recognized and accounted for in policy making and in the implementation process.
- Cases from country success stories: Botswana in the case of setting up an independent regulatory agency and in dealing with issues related to universal access and privatization of the ICT marketplace[64]

The need to Revisit Policies

- Creating a rolling ICT strategy and action planning entity to report on implementation of the ICT strategy and action plan. Some countries have established official structures to monitor the implementation of a national vision or action plan. In principle, the national regulatory agency should be proactive and seek to ensure that issues that fall under its purview are always dealt with.

PART II. E-STRATEGIES

What are e-strategies?

Definition and examples

e-strategies are plans based on the selection of scenarios and options for applying ICTs to national development. e-strategies apply specifically to sectors such as e-commerce, e-government, e-learning sometimes confused with distance learning, e-health sometimes confused with telemedicine and related e-enabled sectors and activities. These e-enabled activities are simply put the application of ICTs to the usual business processes that are specific to each sector and area of human activity and endeavour. e-strategies, like all

[63] The ASEAN Telecommunication Regulators Council (ATRC) in Asia and TRASA in Southern Africa: Telecommunications Regulatory Authority of Southern Africa and the Southern Africa Transport and Telecommunications Commission, both associated with Southern African Development Community (SADC)

[64] Botswana: Effective regulation case study. http://www.itu.int/itudoc/itu-d/publicat/bo_ca_st.html

planning activities, are only as good as the information on which they are based. Sound research and in depth consultation are required to identify and assess constraints and opportunities and make appropriate choices.

The types of strategies

Each country and jurisdiction has its own specificities no matter what its level of development. However, the development status of a country or jurisdiction is greatly affected by the level and extent of poverty, by instability due to conflict, as well as by reconstruction and reconciliation efforts in post conflict situations. The capacity to implement an ICT strategy and action plan under these and similar circumstances will likely be very limited. Any proposals that are made need to be consistent with national capabilities.

Does this mean that a different approach needs to be considered when developing ICT strategies for the poor or lesser-developed countries and those at the bottom of the HDI rankings? Based on experience gained in many countries, it is best to avoid generalizations, but there are some approaches that need to be taken into consideration.

Even in the poorest of countries, there are opportunities and there are leaders and actors al all levels who are prepared to make a difference. The scale and pace of the interventions proposed may need to be reduced, but the opportunities will still be there. Even the poor have ambitions and can recognize an opportunity when they see one.

Take for example Niger, one of the poorest countries in the world located in the Sahel region of Africa. Here, a surprising level of interest was demonstrated in the use of community radios. 27 community radios were installed there up to 2002 and 20 more are planned. The ambition is to install community radios in 160 different communities throughout the country.

ICT strategies and the accompanying efforts that they entail, including e-readiness and other user needs and market assessments can lead to novel, workable and promising interventions. For poorer countries or regions, these are not likely to be on the same scale as they would be in countries where there is more capacity.

In poorer countries, it is most important to ensure that ICT strategizing takes into consideration efforts at poverty reduction as well as other development initiatives that are taking place. This of course applies in general to all countries and not in dealing with poverty. In these countries, ICT strategies need to be consistent with national poverty reduction strategies as well as other national development strategies and initiatives. Under these conditions, ICT strategies will need to focus on capacity building and especially on education.

Box 5 National poverty reduction strategies and ICT strategies

ICT strategies need to be consistent with national poverty reduction strategies as well as other national development strategies and initiatives.

Distance learning is another application that may have an important role to play in poor countries. In all countries, immaterial of poverty levels, parents will do their utmost to help their offspring take advantage of opportunities to learn and advance.

There will be a need for a special focus on the role of ICTs in education. Poorer countries will not have the infrastructure necessary to support the full transformation of the country and its full inclusion in the information economy. Efforts to support key government departments and key sectors of the economy will be a priority. ICT deployment may be best considered as part of efforts to strengthen the capacity of government and of the private sector. Because poorer countries will more likely be faced with human survival issues, the question will have to be posed: to what extent can the country afford to invest in ICTs when basic human needs are not met?

E-strategies are defined in terms of development objectives and outcomes

In planning for the use of ICTs, there is sometimes a tendency to focus on the rollout of technology, especially hardware and computer applications as measured by the number of PCs, the cost of Internet access, etc. ICT and especially Internet diffusion statistics are readily quoted in the media. Many studies compare the level of e-readiness between countries in terms of number of PCs per use or number of Internet sites, etc.

But ICT strategies are to support existing development priorities and to seek out other opportunities that can be realized in support of the countries human development ambitions through the appropriate use of ICTs.

HOW ARE STRATEGIES ACHIEVED?

Setting strategic goals

Strategies are achieved using tools and approaches such as visioning and comparative analysis, including studying and comparing international experience and best practices. ICT strategies start with the development goals of the country and take into consideration the specificities of that country. Invariably, the goals of national development are to seek, develop and maintain comparative and competitive advantage in economic terms especially. ICTs are tools to help this happen and to ensure that people are better able to benefit as a result.

A key component of strategic planning for human development is consultation. Consultation is needed on an ongoing basis. It is an iterative and ongoing process that may need to be institutionalized or supported on an ongoing basis. The regulatory agency can have a role to play here, but NGOs and other observers and participants should also be involved. ICT strategies and their implementation need good governance to succeed. It may be useful to check on progress and to ensure impartiality by bringing outside or neutral observers to comment and contribute on an ongoing basis.

e-Readiness Assessments

Most e-readiness assessments methodologies are rapid assessment tools designed to measure the spread or diffusion of ICTs in a country. This means analyzing ICT use in all sectors of the economy and at all levels of society. Because some e-readiness assessment methodologies are undertaken from the perspective of business or economic development, they rarely consider the role of ICTs in less productive areas of society such as in remote and generally rural areas and especially among the poor or less economically productive elements of the economy.

To some, looking at ways of strengthening the capacity of the poor to contribute to the economy is bound for failure: better focus on the productive sides of the economy than waste meager resources on the non-performing poor. e-readiness methodologies such as those used by The Economist fall under this heading[65]. Consider the following:

"E-readiness" is shorthand for the extent to which a country's business environment is conducive to Internet-based commercial opportunities. It is a concept that spans a wide range of factors, from the sophistication of the telecoms infrastructure to the security of credit-card transactions and the literacy of the population. Countries need to tick off a long list of prerequisites, we assume, before they can stimulate the creative ferment that the US has witnessed over the past five years.[66]

Some e-readiness reports read like a port-mortem analysis, identifying areas of health and areas that need to be remedied in order to reach a higher state of readiness as exemplified by what has been achieved in some industrialized countries. Such post facto analysis is limiting factor in many e-readiness assessments. Indeed, many e-readiness assessments, including many listed by Bridges.Org do not even concern themselves with the needs of people for ICTs and for information. There is a need for a better understanding of what the people and the market want and can bear.

[65] Economist Intelligence Unit ebusiness forum. 2001. *The Economist Intelligence Unit/Pyramid Research e-readiness rankings.*
http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=367

[66] Economist Intelligence Unit ebusiness forum. 2003. *The Economist Intelligence Unit/Pyramid Research e-readiness rankings.*
http://www.bvom.com/news/english/news/index.asp?.sequence=3767&.this=64

A pro-West bias in assessment methodologies?

While undertaking an assessment in the context of an ICT strategic planning exercise, one specialist recommended bluntly to the author that the best way for the country to move ahead and use ICTs was for everyone to learn English!

e-readiness methodologies need to be more people centered and to deal with needs as well as wants and human circumstances instead of merely being prescriptive analysis of a given state compared to what exists in industrialized countries. To help remedy this situation, in depth user needs assessments and market analyses can be very helpful. In rural areas and among poorer or more marginalized communities, they are essential.

Methodologies that are more inclusive have been used and adapted to various in country situations are described at the Bridges.Org site. The Harvard Methodology has proven adaptable, as all of these methodologies must be.

Some methodologies can be applied online without any or very little in country consultation and research.

Strengthening e-readiness assessments

To strengthen the methodology for undertaking e-readiness assessments in order to provide more and better information about human development concerns for developing ICT strategies and action plans, the following is proposed:

- Adapt e-readiness assessments to the needs of all people, including the marginalized, the poor, rural dwellers and others

Several of the e-readiness assessment methodologies listed on the Internet are not concerned with the poor and other non-business users. The poor are relegated to the 0 column and completely forgotten – they do not compute! It is necessary to strengthen assessment tools so that they better reflect the needs for ICTs strategizing from a human development perspective.

e-readiness is supposed to be about potential. But information from all people is needed and can often times by very important and very useful in understanding local specificities, opportunities and options. Without information about people's needs and circumstances, ICT strategies cannot be complete. E-readiness assessment methodologies need to better reflect this. One way of doing this is by talking to people and asking them about their needs and concerns. In fieldwork undertaken in China and Botswana to better understand the needs of rural dwellers, three issues were considered to be important in understanding the factors affecting the use of information and of ICTs, the challenges to be overcome and the opportunities that may exist. These are: the development priorities of the community; their information needs and the communication vehicles used.

How do e-Strategies address the Development Dynamics

Using or accessing ICTs per se is not the development goal or outcome looked for in ICTD projects, programmes or activities. The development goal is not to bridge the digital divide per se. The goal is to promote human development and to reduce and eliminate poverty as a result[67]. To achieve this goal, it will be necessary to bridge the digital divide[68].

ICTs, as part of a broad based strategy for human development, facilitate greater access to information, resources and people as a way of empowering change for human development. The real goal is empowerment through information. The outcome is people and communities, including organizations and development actors especially, who can better manage their own destiny and reach their own human development objectives because they are informed and because they are knowledgeable and can act on decisions that influence them.

Freedom of access to information is a key part of this, along with freedom of expression that allows people to take advantage of these resources and opportunities. In reality, most jurisdictions accept the need to have freedom of access to business information and to other information that touches directly on economic development. Other issues are sometimes better left alone, especially if they touch on politics and society.

ICTs promote human development and help achieve the goal of reducing poverty in three ways. By:

- Facilitating access to knowledge and information sharing
- Assisting developing countries in catching-up and being part of the evolving information economy
- Acting as enablers of development by encouraging empowerment.

ICT policies and e-strategies need to address these issues.

e-Strategies for Infrastructure development

ICT strategies will need to consider telecommunications strategies governing access to the networking and communication media. Of particular concern here will be the development of Internet access strategies. The key will be to ensure that as much bandwidth is available as is necessary to users in the country at a cost that is as low as possible consistent with the commercial operation of the telecommunications network. In order to limit expenses for unused bandwidth, bandwidth-provisioning solutions based on dynamic bandwidth allocation may be appropriate.

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[67] Marker, P. McNamara, K. and Wallace, L. 2002. *The significance of information and communication technologies for reducing poverty*. Department for International Development. London. 64 pp.
[68] Labelle, R. 2003. Information and communication technologies for Development in National Human Development Reports. UNDP. New York.

These concerns will address bandwidth coming to the country, and by extension, bandwidth requirements within the country. Concerning the development of national ICT infrastructure, this is the purview of the national operators, but government has a role in developing the policy that will guide and especially incite and support infrastructure development efforts and investments because this is in the public interest. Universal access policies are intended to do just that. Invariably, national ICT infrastructure will grow with demand and ICT policies enacted and enforced by the government through the regulatory agency will ensure that this takes place.

The ICT strategy will be concerned with ways to spur the growth of national infrastructure in a fashion that keeps costs down so that as many can benefit from its use as possible. Universal access policies are intended to ensure that all inhabitants of a country are assured of receiving basic telecommunications services. Basic telecommunications services have invariably been considered to include access to the telephone but are defined more broadly by the World Trade Organization as follows:

Box 6 Basic telecommunications services - WTO[69]

Basic telecommunications include all telecommunication services, both public and private that involve end-to-end transmission of customer supplier information.

Examples of basic telecommunication services:

(a) Voice telephone services
(b) Packet-switched data transmission services
(c) Circuit-switched data transmission services
(d) Telex services
(e) Telegraph services
(f) Facsimile services
(g) Private leased circuit services
(o) Other

-Analog/digital cellular/mobile telephone services
-Mobile data services
- Paging
- Personal communications services
- Satellite-based mobile services (incl. e.g. telephony, data, paging, and/or PCS)
- Fixed satellite services
- VSAT services
- Gateway earthstation services
- Teleconferencing
- Video transport
- Trunked radio system services

Encouraging competition

Probably the most important consideration in preparing an infrastructure development strategy will be the need to encourage competing telecommunications and Internet access solutions, services and providers. Competition is a key part of the delivering value and service to ICT users.

[69] http://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_coverage_e.htm

Past experience has demonstrated that monopoly operators overcharge and may also limit access to the Internet. Consistent with this policy will be the need to ensure that peering[70] among and between telecommunications and especially Internet service providers (ISPs) is assured in order to keep costs down and to avoid non-competitive behaviour in the market place.

A strong and independent regulatory regime

A strong regulatory agency will be required. This agency will be responsible for overseeing the operation of the ICT marketplace. Indeed, regulatory concerns will be key in ensuring that the ICT market place operates efficiently and in an open and equitable manner consistent with the concept of maintaining a "level playing field" for all operators. This is also consistent with the requirements of the WTO agreements on telecommunications.

The challenge to many countries that is posed by current regulatory regimes is the need for strong technical, managerial and business skills to ensure that the regulator can do its job. Many developing countries, and especially the smaller and poorer countries, simply do not have the human and technical assets, experience and skills to adequately meet these requirements. There has been some consideration given to the idea of regional regulatory agencies to pool these skills. For example, the smaller countries of the Horn of Africa, Djibouti especially, have considered this. WTO recognizes the needs of developing countries for technical assistance to bridge this gap. ITU also assists in the provision of technical assistance for this purpose.

In developing ICT strategies, countries should not hesitate to enlist the WTO and the ITU as well as national operators from industrialized countries to help them develop appropriate regulatory regimes and ensure that they are can be implemented. The latter can be negotiated as part of bilateral aid programmes.

Some technical considerations

There are two types of telecommunication media that are essential to the exploitation of ICTs for people. The wired infrastructure which is the preferable way to connect to the Internet backbone for reasons of speed and relative reliability, and the wireless telecommunications media that are gaining in popularity and geographic reach with the widespread introduction of mobile phones. Wireless technologies are also much less costly.

Wired or cable based infrastructure works best for transporting vast quantities of data (audio, video, multimedia and streaming application) and this is most appropriate for transaction intensive environments such as urban areas or for techno-parks (more on this later). Wireless technologies are also be used in urban areas but can are especially beneficial in providing cost effective network access to users in more rural and remote areas where their lower cost may allow greater penetration. Under such circumstances, wireless

[70] What is peering? http://iroi.seu.edu.cn/books/ee_dic/whatis/peering.htm

devices may be an essential component of delivering on the promise of universal access.

Nearly all countries around the world are now connected to the Internet backbone. These connections are either based on fiber or metal cabling or on wireless, including especially satellite connections. Fiber cables are preferred because of their capacity, but not all countries are conveniently located near the Internet backbone and international fiber optic networks, although this is changing somewhat. National strategies should look at alternatives to connect as directly as possible to any of the international fiber optic networks. Because there is a global oversupply of bandwidth, costs have decreased considerably and there may be good opportunities to exploit this bandwidth glut.

Countries through their ICT strategies need to develop broadband connections and a key part of ICT strategies will be concerned with how to provide as much bandwidth as possible at the lowest cost possible to enable key applications and to connect as many users as possible. One way is to encourage competition in access to international bandwidth using whatever technologies and providers are appropriate. In South Africa, an ADSL connection is cheaper that a dial-up connection because there is no cost associated with a timed telephone call.

Another concern will be to ensure that the private sector has access to the high-speed connections essential to business today. Many countries are considering or already have developed techno-parks combining high-speed access to the Internet with ICT businesses with a view to creating clusters of excellence that will hopefully bring investors or at the very least support existing firms by providing grouped services at a reasonable cost. More important however for business will be the measures and infrastructure that will make it easier for any business to gain rapid, reliable and secure connections to the Internet at a reasonable cost.

Techno-parks are not panaceas though. In discussions with many developing countries, it has been made clear that the expectation is that once government invests in creating a techno-park and in bringing the requisite high-speed infrastructure to these facilities, they will immediately attract some of the major ICT industry players. Techno-parks and other facilities intended to attract investors and promote the ICT industry should be based on sound market studies.

The allure of wireless

Wireless technologies have advantages that need to be taken into consideration in ICT strategic planning. The rapid diffusion on wireless technologies and the rise of the “mobile Internet” present real opportunities for delivering a host of applications and services for individuals and especially for small and medium sized enterprises (SMEs) and for business in general. Mobile devices offer real advantages in rolling out financial, credit and payment services to customers in many developing countries who cannot

acquire a credit card. For health management, and especially for patient follow-up, mobile devices used in conjunction with applications such as short message service (SMS) offer real advantages and have been demonstrated successfully in treating people afflicted by tuberculosis in South Africa[71].

As a result, this technology has great potential for treating patients with HIV/AIDS. Similarly, some banks in the developing world are now offering the capacity of consulting one's bank accounts online, as well as paying bills online. The potential of SMS is now being explored throughout the world and will undoubtedly support the extension of the wireless network as well as the Internet. By 2008, the ITU predicts that 1in 3 people around the world will own or have access to a wireless device[72].

A further advantage in encouraging the development of wireless technologies is the introduction of faster wireless access technologies and preparation for the migration to IPv6, the upcoming revamped Internet protocol. Increases in bandwidth of wireless technologies may be especially useful for developing countries because they will not require the investment in hard infrastructure that cable telecommunications cables require. Increases speed and in the diffusion of Internet ready mobile devices will lead to growth of the global Internet. ICT policies need to consider these opportunities an to prepare the ground for the country to take advantage of them and especially to allow the private sector to fully integrate these into their business activities in order to ensure competitive advantage.

IPv6 will dramatically increase the number of IP addresses available. It is estimated that as a result, appliances and technologies of many types will become connected to the Internet. ICT strategies need to consider these developments.

Comparative advantage comes from reliable and secure high-speed access to communications and especially to the Internet. The convergence of text, voice and video means that a secure high-speed channel is all that is required to participate in the information economy further confirms this. Building high-speed access infrastructures is the backbone to the value added applications and services that ICT strategies seeks to being to people and countries.

In summary:

- Infrastructure is essential for information access
- Appropriate access technologies need to be used or tested. Wireless has significant potential and many advantages. Bidirectional satellite technologies are now appearing around the world and these may offer possibilities for connecting even the remotest communities
- Policies affecting the business climate and the operation of the telecommunications market will determine the extent to which private

[71] Automated SMS scheduling and delivery. http://www.compliance.za.net/; and: Case study: The Compliance Service uses SMS technology for TB treatment. http://www.bridges.org/iicd_casestudies/compliance/index.html

[72] ITU. 2002. Internet for a mobile generation.

investors will underwrite the investments required to create the telecommunications infrastructure and to provide the applications and services to create value for the consumer, business and government alike

- Traditional ways of exchanging information as well as non-digital ICTs such as radio need to be recognized in the selection and justification of the access technologies to be deployed. Radio continues to be the ICT with the greatest penetration worldwide
- Shared, community or public access strategies and solutions will need to be considered because it is not possible to provide individual access solutions – i.e. universal service - to everyone
- Local circumstances such as literacy, language and availability of accompanying infrastructure such as electrical power also need to be considered.

e-Strategies for Human Capacity development

The lack of people with the technical and managerial skills to use and apply ICTs is a severe constraint limiting ICT deployment around the world. Today, even industrialized countries have an insufficient number of trained ICT technicians and specialists. A severe shortage of skilled ICT labour exists and has compounded the problem that many developing countries face because trained personnel from the developing world are ever more likely as a result of this skills shortage to seek work in industrialized countries.

The ICT strategy will have to consider ways of over coming this situation, but there are no easy solutions, except perhaps to grow local opportunities that compete with international ones. This has not proven easy, although there are some examples that are worthy of mention such as the efforts Costa Rica has marshaled to attract Intel.

In building ICT skills, the place to start is the schoolroom. China has an ambitious programme to rollout telecommunications networks and infrastructure and this is accompanied by efforts to develop computer literacy at the primary and secondary school levels. Singapore and other countries have also done this.

Invariably this means starting by strengthening the capacity of the formal educational system. While the ministry of education may need to be strengthened, this is only to ensure that the ministry has the requisite human and technical skills to fully appreciate the situation and to understand this options available to remedy this situation. Foremost is the need to strengthen the capacity and ability of teachers and schools administrators.

Educational strategy setting for ICT diffusion starts with an assessment of human and technical capacity. Invariably, e-readiness assessments will look at the number of PCs in schools and classrooms as key indicators of ICT training and awareness. But there is a need to go beyond the figures. The question to be considered as part of the vision setting exercise for example is what do we want for our children in the future? What vision of an ICT enabled

society is appropriate for our country and how should learning about ICTs be structured as a result. Is there sufficient information in local languages to enable the efficient and desired use of PCs or will this only result if children influenced by information in other languages and values that may not be consistent with traditional ones? Another issue is how to measure results of the educational strategy and related policies? Providing computers to schools and developing SchoolNet programmes may not be sufficient.

In many countries where one of the major international languages, let us say the languages of the United Nations, are not the language of the community in question, accessing the Internet may not be very helpful. Efforts to build the capacity to use ICTs including the Internet in education will invariably have to include efforts to create locally appropriate content. Just as this was the case when developing curriculum materials and books in local languages, so it will be in the case of exploiting the Internet for teaching at the primary, secondary and other levels as well.

Teaching basic ICT skills starts in the younger years. Primary schools should be able to teach pupils the basics of operating a computer and accessing the Internet. Secondary schools should build the basis for using the key productivity applications necessary for life in the information economy.

e-Strategies for Policy development

Importance of policies

The underlying intention of ICT policy development is to ensure that ICTs are as accessible as possible and in a fashion consistent with local specificities. Investors and the international community use the policy environment as a gauge of the true intentions of a government. But the policy environment goes much beyond simply reading and interpreting the laws and regulations governing ICT diffusion. The ease with which investors and others can obtain redress under the law or seek recourse from the regulator, as well as jurisprudence in applying the laws and regulations are evidence of government intentions and of the extent of the rule of law.

The ease with which businesses can register, start operation and obtain financing is another measure of openness to business. The application of policies is just as important and what is written down in legal texts, often times more so.

Because many new technologies are often brought to market through the initiatives of smaller, newer and nimbler companies oftentimes operated by younger and more technologically savvy people, constraints to new entrants into the marketplace can have serious repercussions in introducing innovations. This aspect of national policy is especially important if efforts to stem the brain drain are likely to succeed. It is clear that if young and able business people are not able to unleash their entrepreneurial energy and establish their businesses locally, in their home countries, then it should come as no surprise that they leave in search of greener pastures.

Many countries have enacted treaties and legislation, but do not provide any mechanisms for applying these agreements or laws. Organizations such as the World Economic Forum and Transparency International publish assessments of government performance in applying laws and regulations. Preferential treatment and discrimination is readily reported on in publications such as the World Competitiveness Report and Transparency International corruption index.

The strategy for e-policy development

The strategy for policy development may start with the basic issue of freedom of access to information. This will require a definition of what is freedom of access, to what types of information does this apply, what is restricted and under which conditions. Invariably, information deemed to be of public interest will be readily available. Some jurisdictions start with the assumption that everything that is in the public domain, with the exception of personal and private information such as salaries, personnel files and information about the health status of the individual are in the public domain.

Similarly, depending on the definition, information deemed to be of importance for national security reasons will be considered privileged. In each case, definitions will be required.

Consider the information access policy of the Government of India[73], the intention of which is:

To provide for freedom to every citizen to secure access to information under the control of public authorities, consistent with public interest, in order to promote openness, transparency and accountability in administration and in relation to matters connected therewith or incidental thereto.

The bill includes several exclusions, including one that states that information that is "…general in nature or is of such a nature that, having regard to the volume of information required to be retrieved or processed would involve unreasonable diversion of the resources of a public authority or would adversely interfere with the functioning of such authority..".

Freedom of access to information as well as other aspects of information policy such as freedom of freedom of expression or freedom of association is sometimes enshrined in the constitution. This is the case in South Africa for example[74]. In countries where basic freedoms are not enshrined, it may be necessary to include them on a case by case basis, when the opportunity presents itself, for example in developing regulations and policies that govern the Internet itself[75].

[73] Lok Sabha (Parliament of India). 2002. *The freedom of information bill 2002.* http://www.manupatra.com/downloads/acts/the%20freedom%20of%20information%20act%202002.htm

[74] James, T. 2001. An information policy handbook for Southern Africa. A knolwsedge base for decision-makers. IDRC. Ottawa. 227 pp. www.dbsa.org/publications/ictpolsa and www.ap.org/books/ictpolsa .

[75] James, T. 2001. idem.

The James report lists other information policy concerns that may need to be taken into consideration (adapted from James, T. 2001 referenced above):

- The legal and regulatory frameworks that govern ICTs should be integrated with frameworks governing other media
- Organizations, communities and individuals should be free to use the Internet to organize and engage in public or political protest
- The need to maintain content diversity and limit monopoly. In smaller markets and countries, local content may be limited and should be as freely accessible as possible
- Personal information help by private or public bodies should be protected from any unauthorized disclosure
- All decision making processes related to the governance and development of ICTs such as assigning telephone numbers, certification authorities, domain names and numbers should be open and accessible at local, national and global levels
- ICT governing bodies such as regulators and government bodies must make information available on rights and procedures.

e-Strategies for Enterprise development

This section will look at strategies that help all enterprises, and especially those enterprises that can take advantage of resources and tools such as e-commerce and other forms of e-business as well as strategies and approaches that need to be considered to help less capable business operators such as small, medium and micro enterprises (SMMEs) make beneficial use of ICTs. The objective of strategies for SMMEs is to help them harness these tools and associated information management practices to strengthen their capacity to contribute to the economy and employment and in so doing, to reduce poverty and help bridge the digital divide.

Small, medium and micro enterprises (SMMEs)

Larger businesses are more likely to have the capacity to use ICTs for comparative advantage. Small medium and micro enterprises (SMMEs) on the other hand are less likely to have this capacity. Yet these smaller enterprises are the engines of employment and are on the front lines in the fight against poverty. Strategies that strengthen the capacity of SMMEs are also strategies that support poverty reduction. Strategies that can encourage greater use of these technologies are therefore important.

In many countries of the developing world, and especially in the poorer and often in rural areas, information gathering and sharing behaviour are invariably informal. Here, small and usually family run businesses are usually associated with subsistence or the necessity to make some cash payments, for example payment of school fees or the purchase of seed and of agricultural amendments. Revenue generation comes from the sale of

agricultural products, dry goods or the provision of some service of local utility for cash.

Under these circumstances, businesses are especially challenged because the resources for gathering and sharing information will be limited and will have a tendency to be based on relationships of familiarity and be local in nature and extent. Appropriate technologies and modern management practices will be used very little if at all. They will be beyond the reach of the business operators. In many circumstances, the infrastructure – or lack of infrastructure as well as the cost associated with its use - will also limit access to ICTs, with the possible exception of radio, and perhaps, the telephone and in a few but ever increasing number of cases, the cellular phone.

There are few in depth studies of the information sharing habits and ICT requirements of smaller businesses in the developing world. The results from the following study, although undertaken in Botswana in Southern Africa, are considered generally relevant even to Asia and are quoted here. Heeks, one of the main authors of this study is a well respected ICT specialist who with his colleague Duncombe of the University of Manchester in the UK have undertaken this study in Botswana - in part because of the availability of relevant information there. The results can be generalized to SMMEs around the world and in Asia.

In Botswana, Duncombe and Heeks report that 70% of respondents to their survey on information and ICTs in small enterprise undertaken in the year 2000 "*frequently used fixed line telephone and fax … and about one quarter of enterprises were using mobile telephony and email, though far more service than manufacturing; and far more exporters than non-exporters*"[76]. In characterizing information sharing practices in Botswana, Duncombe and Heeks of the University of Manchester, have proposed a typology of small business types:

Small Enterprise Types[77]

Survivalists: those who have no choice but to take up the income-generating activity because they have no other source of livelihood. Income provided may be poverty-line or even subpoverty- line. Most 'entrepreneurs' in LDCs are of this type.

Trundlers: those whose enterprise turnover is roughly static and who show no great desire or no great capacity to expand. Income provided will be enough

[76] Duncombe, R. and R. Heeks. 2001. Information, ICTs and small enterprise: findings from Botswana. Paper no. 7. Development Informatics Working Paper Series. Institute for Development Policy and Management, University of Manchester. Manchester. 16 pp.

[77] Adapted from Grindle, M. et al. (1989) 'The framework', in *Seeking Solutions*, C.K. Mann et al. (eds), Kumarian Press, West Hartford, CN, 1-98; and Mead, D. (1994) 'The contribution of small enterprises and policies to employment growth in Southern and Eastern Africa', *World Development*, 22(12), 1881-94., as cited by: Duncombe, R. &. R. Heeks. 2001. *Information and communication technologies and small enterprise in Africa*. Summary Final Report. IDPM. University of Manchester. 26 pp.

to meet basic needs. These form the second-largest group of small entrepreneurs in LDCs.

Flyers: those true entrepreneurs who have taken up enterprise because they see opportunities for growth. Income levels may meet more than basic needs, and enterprises may graduate to the medium-scale category. Only a very small proportion of LDC small entrepreneurs fall into this category.

Duncombe and Heeks further characterize survivalists and trundlers as follows:

Survivalists and trundlers *more often have characteristics that include: domestic-oriented, citizen-owned, informal sector, smaller, rural, with a narrow customer/supplier base. For these, there is a sense that information is not that critical an issue; there are greater constraints that relate to markets, money, skills and motivation. For some, these constraints are almost intractable. They have the least capacity to meet information needs, and are likely to want to rely most heavily on enterprise-support agencies to meet those needs. They are not approaching the transition point... They need help building informal linkages. ICTs are of limited value.*

The small enterprises that are ***flyers and potential flyers*** *are more likely to be export-oriented, non-citizen-owned, formal sector, larger, urban, with a diversified customer/supplier base. For these enterprises, information moves up the priority list but they have a greater capacity to meet their information needs. They need help building business linkages. ICTs can be of quite significant value and these enterprises should be the priority focus for ICT interventions: they are better placed than others to make use of ICTs, and they provide a greater capacity to generate wealth, employment, exports and innovations.*

Duncombe and Heeks suggest that the "*vast majority of formal sector SMMEs serve local markets and reply primarily on locally generated information*". Furthermore, "*the evidence shows that it is only in specific sectors, such as technical services, the IT sector and travel and tourism, that information access benefits can be achieved as yet*".

In conclusion, it appears that smaller enterprises do not have the capacity to use ICTs effectively. Capacity building activities are needed to develop the capacity of SMMEs in poorer and more rural areas. These business operators may not be able to benefit from the use of ICT. Policies need to be considered that will strengthen the capacity of SMMEs to take advantage of ICTs. Policies need to be put in place to encourage the transformation of local businesses into the flyers and potential flyers mentioned above.

Building the capacity of SMMEs to use ICTs

Strategies to develop the capacity of business operators are therefore more likely to have to focus on SMMEs, and especially on transforming existing enterprises into the *flyers* that are most likely to be successful. Some approaches to building the capacity of SMMEs especially and of the business sector in general are proposed below:

Strategies to strengthen the capacity of the business sector

Given the situation outlined previously, it is clear that some basic business development activities are required starting with awareness promotion and possibly the provision of business extension services similar to the extension services deployed in agriculture.

Awareness promotion and demonstration activities will help to communicate new approaches to business management. In Huoshan county in Anhui province in China, SMMEs - including individual farmers who fit the business types cast by Duncombe and Heeks - in rural areas have shown great interest in the use of the Internet for accessing opportunities to buy and sell agricultural goods and to decide what cash crops they will plant. The mass media and word of mouth have been useful in promoting knowledge of and use of the agricultural information service.

Awareness promotion activities designed to encourage greater use of ICTs by SMMEs will benefit from the use of success stories to entice target operators to pay attention. Strategies that invest in the basic infrastructure that will make the use of ICTs easier for SMMEs, as is the case in Huoshan and most likely in other parts of Asia, should be part of any ICT promotion and support strategy focused on building the capacity of SMMEs to use ICTs. In the example from Huoshan, the technology most useful is the telephone and a centrally located access point to the Internet. Participants need not even know about the Internet per se, but need to know about the application – an ICT enabled agricultural marketplace and information service that depends on the Internet.

As in other aspects of ICT policymaking, it is important is to focus on appropriate and needed applications that can be enabled as a result of using ICTs and that reinforce current business practices and facilitate and render more efficient the operation of locally accessible markets. The agricultural information service described above is certainly one of these and there are likely many others to speak to in Asia.

Business incubators

Business incubators provide common access to the resources, support and services that smaller and newer businesses need to establish themselves successfully in a given environment. The International Association of Business Incubators (Check name) has developed models of business incubators.

In ICT strategy setting, business incubators have a role in strengthening the capacity of SMEs and SMMEs to plan and manage their enterprises. Business incubators are more concerned with business processes as opposed to focusing on the use of ICTs. Many SMEs and SMMEs will require assistance in developing their business plans and then building their basic business management skills. ICTs can then be integrated into the operation and management of their enterprises. Business incubators should therefore focus on the use of ICTs in support of the usual business processes starting with basic business and office productivity applications before progressing to e-business applications. The latter will probably be of greater importance, initially anyway, to export oriented businesses.

Local and community access centres for business

Local and community access centers that can also be used by the business community and for those wishing to learn basic ICT skills (word processing, etc)

For business operators operating at the community level, developing a business incubator or other business-focused facility is probably not possible – at least not in every community. Instead, multipurpose community ICT service centres and access centres may be more appropriate. Such facilities can be established in collaboration with telecommunications operators and/or with business associations. Some can be established with the support of the community and considered a community asset.

There are many models of local and community access that can be considered here – but nearly all suffer from a demonstrated inability to achieve self – sufficiency.

Marketing information services and trade information services

This section will consider marketing information services and trade information services delivered to users throughout the country, and especially those working in the rural areas and in the agricultural sector.

There are examples of ICT enabled markets that provide easier access to available information about commodities. Operators obtain information about the prices of produce in a given market or via the newspaper and then broadcast this information using a variety of ICTs including radio, by voice over wireless devices (users call in to a given number to get the information) and by text broadcasts over short message service (SMS). Other related information may also be available. For example, fisher people relying on broadcasts of weather information along with broadcasts of market prices. The agricultural information service in Huoshan is a good example of such a service.

In larger and more industrialized economies, ICTs are the cornerstone of the efficient operation of global market places, including horizontal marketplaces in Asia mentioned previously.

e-Strategies for content and knowledge management

The need for locally relevant and appropriate information on the Internet is clear. Policies that recognize and encourage the creation of local content are a cornerstone of the knowledge society. English may be a lingua franca of the global Internet; it is not appropriate for many countries and regions. Part of the value proposal of the Internet is that information and applications that are locally appropriate are or will be available. Part of the value proposal of the Internet is not only that it is ubiquitous, but also that it is user friendly.

Policies need to create the incentives for content providers, especially the local media, the government, the education and research community as well as the private sector to establish their presence in local languages and to create local content. The diffusion of the Internet in Thailand has suffered as a result of the language issue (see Text box). Issues related to the standardization of local scripts – where appropriate - must be dealt with so that a common keyboard can be developed for example and so that applications are standardized around agreed upon fonts and their representation. Promotion of valued added Internet service providers (ISPs) can be brought about by opening up the market for Internet services and by ensuring that the market operates a level playing field where operators compete freely.

Box 7. Language limits Internet penetration in Thailand[78]

In Thailand, "probably the biggest barrier—both to Internet, and to mobile data services usage—is language. While it has a high literacy rate for the region—around 95 per cent—it is estimated that less than five per cent of the Thai population speaks English. The absence of Thai language Internet content is still an obstacle to users wishing to access predominantly English-language Internet content. Similarly, the relatively poor take-up of SMS services has been attributed to the lack of Thai language support in mobile handsets. Several other countries with non-Roman alphabets, including countries of the FSU where the Cyrillic alphabet or a Romanized version of the Cyrillic alphabet is used share a similar problem to a greater or lesser extent.

Policies are needed to encourage greater access to educational resources in local languages and according to local values and beliefs. Straight translations will not do. Policies to encourage the adaptation of educational resources to the classroom are needed, just as they may have been needed when developing textbooks in local languages.

Promulgating policies are not sufficient. ICT strategies need to consider how to make this happen. Education strategies and action plans need to recognize this and do something about this situation. For smaller language and cultural constituencies, these issues are of great concern. But even in larger countries

[78] ITU. 2002. ITU. 2002. *Internet for a mobile generation*. ITU Internet reports. Geneva 240 pp. See page 112.

and jurisdictions, and in industrialized countries and trading blocks, the issue of foreign language and content dominating the Internet is considered a threat to cultural sovereignty. Countries such as Canada and France, and the European Community in general, are concerned about what they consider threats to their language, culture and values. Policies to guarantee local content have been much used by these and other countries in encouraging local media such as newspapers and other media outlets, including the production of films and the publication industry.

Finally, policies to curb the spread of objectionable material and messages including pornography, racism, and incitation to violence and hate are required. Because of the global spread of the Internet, it appears that these policies need to be integrated with global efforts of international police networks and related agencies leading the fight against international criminality and terrorism.

As digital tools for managing and communicating information become more pervasive, concerns about privacy need to be taken into consideration. The pervasiveness of databases and of the Internet, and the tendency to want to centralize these databases poses serious challenges to the privacy of individuals, companies and other moral and/or legal entities. There are also the security concerns caused by criminal elements as well as hackers and crackers trying to breach the security of the Internet and of firewalls and secure applications including the databases mentioned above. Clearly though, the priority is privacy of the person and the right to personal privacy.

Some jurisdictions have forbidden the centralization and/or consolidation of citizen databases by governments and by the private sector (i.e. insurance companies, banks, medical professionals, etc.) for fear they can lead to discrimination in one form or another, for example discrimination because of health history or genetic predisposition to certain medical conditions. Canada is one such country.

Finally, the issue of knowledge management requires in many jurisdictions attention to such mundane activities and applications such as records management. As mentioned previously, public records are the documentary evidence on which the rule of law is applied. Policies to ensure that the legal documents are preserved and recorded are essential to the operation of the state and to ensure the rule of law.

In summary, content policies need to support the creation of locally relevant content that corresponds to the needs and concerns of intended users and beneficiaries. An important and related issue concerns local and national language fonts and character sets for use with PCs and over the Internet. Government needs to be aware of this issue and to encourage and support a single solution.

The importance of the national e-strategy agenda

The national e-strategy agenda needs to set forth a timetable and plan for implementation of the policies and the national ICT strategy. The agenda is needed to show commitment to the people and that the government is serious about moving ahead. Details about the agenda and the implementation of the e-strategy come in the action plan.

Developing action plans

The action plan shows what the implementation of the ICT strategy and related policies will involve will involve and lead to. The action plan should have a list of doable and bankable projects and a list of priorities and their rationalization. The role and involvement of representatives of all stakeholders needs to be recognized and enshrined in the institutional mechanisms and arrangements necessary to oversee the implementation of the action plan. Ongoing review and consultation should be the norm. Monitoring and evaluation needs to be built in. Indicators of success need to be established, shared, commented on and agreed upon in an open and consultative fashion that involves key stakeholders.

Financial arrangements will come from a variety of sources, including existing government budgets and private / public partnerships in some cases. Support from the international community may be available.

Implementation and management

Institutional arrangements to implement the ICT strategy and the action plan are usually presided over by government. A national ICT committee or the equivalent is struck by government, preferably with the support and under the tutelage of the leader of the government or of the country. High profile support and ownership of the ICT planning process is very important. Arrangements for including representatives of stakeholder groups are made. In many countries, these institutional arrangements include strong representation from government ministries. Implementation methods may include a separate implementation agency responsible to the ICT strategy committee of the equivalent. In some cases, a national ministry will be responsible for implementation or will act as a secretariat for the implementation agency.

Other stakeholder groups are also involved, but government usually predominates. The involvement of stakeholders can also be assured by the creation of a board of trustees or a management board to which the executives of the national ICT committee and/or the implementation agency must report on a regular basis.

Implementation methods should allow for public bids to be tendered for those activities and projects for which there is funding. In some cases, there may be a need for an entity responsible for oversight and another for detailed implementation (contract supervision, project supervision, etc.).

There are many models used and some involving the creation of semi-public entities responsible for overseeing and sometimes contracting out the implementation of the ICT Action Plan with a view to using the implementation of ICT strategy as a way of supporting and of building the capacity of the national ICT industry in the process. In some countries of Africa, a separate executing agency structured as an independent organization capable of entering into contractual arrangements is established and works closely with all stakeholders and especially with the government departments and ministries most concerned.

Management tools will include detailed lists of deliverables. Performance indicators to measure progress and results, as well as regular reporting mechanisms will be developed and used. Benchmarks will be set, surveys undertaken that will help gauge progress and public support for the policies and the strategy. Focus groups meetings may be called to get feedback. Formal and independent monitoring and evaluation procedure should be established and put in place. This procedure should be separate from the ICT national committee or equivalent. The regulatory agency, if this exists and if it is appropriate may also have a role to play as an impartial observer. A risk assessment needs to be undertaken and a risk mitigation plan established and acted on.

Some tools for identifying priorities for ICT policy development

Consider the example of the Object Oriented Project Planning (OOPP) methodology used in the Solomons Islands by the PFNet (People First Network) during the ICT strategy workshop[79]. The PFnet project wanted to have a clear indication of the specific needs and problems that ICTs could address in support of national development goals in the Solomon Islands in order to find new strategic areas of intervention.

As a result of this workshop and the use of this methodology, a problem tree was developed to which a solution tree was applied in order to lay the groundwork for developing interventions that are more likely to succeed because they correspond to the needs of people. The steps involved are: to collect a list of problems from the participants taking part in the workshop; then build an objective tree which starts with search for of an objective to which all problems can be related. On the basis of this analysis, the problem tree is reformulated into an objectives tree where groups of related objectives with a similar topic are clustered and labeled. Breakout groups made up of participants then analyze the identified clusters and the groups then make recommendations for achieving the objectives represented in the different clusters.

The intended outcomes are listed below:

[79] Stork, E. Leeming, D. and Biliki, R. 2003. *Solomon Islands ICT strategy workshop report. February 10-11- 2003*. UNDP Sub-office. Honiara, Solomon Islands. The Electronic Journal on Information Systems in Developing Countries. Vol. 12, No. 5, p 12.18.

1. List problems identified by workshop participants in relation to main problem identity. Consensus reached on all the listed problems.
2. Problem tree developed from problems listed by all participants. Full consensus reached on all cause effect relationships in the problem tree.
3. Objectives tree derived from the problem tree with full consensus by all participants.
4. Recommendations for the future collected from participants on clusters of the objective tree.

The following clusters were identified in the workshop (see the graphic below):

Policy
Affordable Access
Networking/Awareness
Equipment/Access
Education and Training.

Figure 2. Identifying policy clusters in the ICT objective tree